Are We Prepared?

FOUR WMD CRISES THAT COULD TRANSFORM U.S. SECURITY

Center for the Study of
Weapons of Mass Destruction

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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 combating 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/.

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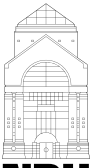

National Defense University
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Preface

This report, written by the staff of the National Defense University Center for the Study of Weapons of Mass Destruction in the fall of 2008 and the early winter of 2009, was conceived initially as a transition paper for the new administration following the 2008 American Presidential election.

This report presents four weapons of mass destruction (WMD)-related scenarios that could plausibly occur and radically alter American domestic and national security agendas. Moreover, these scenarios, for which the United States is underprepared, portray challenges that the United States will not overcome shortly. Developing, institutionalizing, and supporting those policies, capabilities, and technologies to successfully overcome these challenges in all likelihood will take years. Consequently, we believe that this paper will continue to have relevance to policymakers, warfighters, responders, and the larger combating WMD community over the coming decade. For this reason, the Center for the Study of Weapons of Mass Destruction has chosen to publish this report for a wider audience. We believe that the challenges, concepts, and recommended solutions herein will provide insight to students and practitioners alike.

— John F. Reichart
February 2009

Executive Summary

This study addresses the ability of the U.S. Government to cope with four plausible, far-reaching weapons of mass destruction (WMD) crises, any one of which could occur today and adversely affect the foreign and national security policies of the United States for many years to come:

- collapse of the nonproliferation regime, in which a number of unresolved nuclear proliferation challenges threaten to unleash a sudden and destabilizing wave of proliferation
- a failed WMD-armed state, creating unprecedented risks that radical actors will obtain WMD and unprecedented challenges for prevention
- a biological terror campaign, in which terrorists employ deadly biological pathogens to strike at multiple cities
- a nuclear detonation in a U.S. city, delivered covertly and leaving great uncertainty about who did it, whether it will happen again, and how we should respond.

Taken together, these scenarios demonstrate the complex, multifaceted nature of the WMD challenge for American decisionmakers and illustrate the demands that such events could place on the entire apparatus of

government, alliances, and the American people. Our findings are drawn from ongoing research conducted at the National Defense University's Center for the Study of Weapons of Mass Destruction and reflect nonpartisan perspectives and conclusions drawn from extensive interactions with scores of former and serving senior U.S. officials and nationally recognized subject matter experts.

This introductory section presents findings and recommendations suitable for senior civilian and military leaders whose responsibilities include different aspects of the WMD challenge and require them to integrate their departments' activities with those of other departments and foreign governments to prevent proliferation, protect against the effects of proliferation, or respond to the consequences of WMD use. It also describes the present and evolving WMD threat, reviews first principles in combating WMD, and emphasizes the need to act decisively to meet today's challenges.

Why These Four Scenarios?

These four scenarios illustrate near-term threats associated with weapons of mass destruction. They all could occur today using 40-year-old technology. The danger is here and now. Yet should these scenarios come to pass, the United States could be caught dangerously unprepared.

In recent years the U.S. Government has made considerable strides in preparing for individual aspects of such crises. New interdiction processes and activities

have improved our ability to track proliferation-related activities and prepare to stop them. High-value programs are leveraging Cold War technologies to enhance the Nation's nuclear and biological forensics capabilities. Various nuclear and biological detection programs at home and at key ports and facilities abroad have enhanced our ability to stop the smuggling and transfer of WMD capabilities and improved our ability to detect and defend against WMD terrorism at home. As the number of WMD-related programs and activities has grown, however, the mechanisms necessary to coordinate and synchronize responses, adjudicate priorities, and allocate resources across the government have failed to keep pace.

This atomized or stove-piped approach will not withstand its first encounter with a major WMD crisis or large-scale contingency such as the four described here. Organizational and operational responses that rely on neat divisions between counterproliferation and counterterrorism, foreign or domestic responses, military or civilian capabilities, or Federal, state, local, or tribal government responses will collapse in the face of a major WMD attack against the United States or the dissolution of a WMD-armed state. A sustained bioterror campaign need not heed borders or boundaries at home or abroad. Should diplomacy fail to prevent breakout proliferation and sustain the nonproliferation regime, the U.S. military

may be forced to keep the peace among an assortment of WMD-armed adversaries. These crises cannot be easily confined to a region but rather are likely to be global contingencies. Such events could fundamentally alter the security landscape for this and future generations. They are tests we cannot afford to fail.

These scenarios are strictly illustrative, not comprehensive. For example, the United States must be prepared for the prospect of nuclear use not only at home but also on foreign soil, and by both terrorists and states. In addition, the biological threat could take many forms—for example, an attack using a contagious agent such as smallpox or the deliberate spread of foot and mouth disease to cripple the Nation's agricultural and livestock industries and devastate Western economies. Although a chemical or radiological attack was not among the four crisis scenarios in this package, chemical and radiological weapons pose serious threats to the United States and its interests, particularly chemical weapons utilizing advanced chemical threat agents. Nonetheless, the four scenarios present a baseline of possibilities from which myriad requirements flow. They imply the need for multiple, complex, and sophisticated responses, any of which might prove impossible to accomplish at the level needed to reassure the American public. Moreover, they provide a common point of reference for each of the many players across the interagency who own a piece of the WMD

problem and are responsible for a piece of a coordinated Federal and intergovernmental solution. Over the next few years the United States will need to consider each of these different scenarios—any of which could fundamentally alter the course of national security—and develop appropriate strategies and plans to manage them or, better yet, to prevent them.

The Present and Evolving WMD Threat

The current threat environment is sobering. Iran and North Korea continue their nuclear programs. Al Qaeda, by all accounts, remains interested in WMD, including chemical and biological weapons. Insurgents in Iraq have experimented with rudimentary chemical weapons in attacks on American and allied forces. Changes in the life sciences and the spread of advanced chemical industries are making dual-use capabilities more prevalent in more countries. The nuclear energy renaissance has the potential to proliferate nuclear weapons–related capabilities, such as uranium enrichment and plutonium reprocessing, to more countries. And the possibility that more countries are becoming interested in some level of nuclear weapons capabilities seems to grow.

Dealing with threats that could manifest themselves today is not enough. The WMD threat is a complex and evolving problem. As we respond to present dangers, more daunting challenges lie just over the horizon. Events and

trends already evident could greatly complicate the U.S. ability to keep pace with WMD requirements. In particular, we must work now to mitigate the risks posed by several "systemic game-changers" that could fundamentally alter America's ability to respond to future crises.

More modern WMD and means of delivery. Most of the weapons of mass destruction the United States focuses on today have their origins in scientific and technological advances made in the late 19th and early 20th centuries. The science and technology that enable weapons of mass destruction continue to evolve faster than our response capabilities. Advances in biology and chemistry can already produce more formidable versions of some well-known types of biological and chemical agents and can be expected to produce entirely new types of threats in the future. Tomorrow may hold even more grim possibilities given the rapid pace of scientific and technological development in the life sciences and chemistry and reports of some advanced nuclear weapons states' research on exotic nuclear weapons effects.

While such trends are recognized and important efforts are under way to meet them, our current counter-WMD programs and activities are overwhelmingly geared toward traditional threats. For example, most of our existing medical countermeasures for biological agents are directed at the same threat agents we were concerned about two decades ago. We have yet to develop an approach that keeps

pace with threat agents that can be genetically modified. Our chemical weapons defenses remain geared toward the traditional agents listed by the Chemical Weapons Convention and toward toxic industrial chemicals. Our technical nuclear forensic capabilities largely are aging legacies of Cold War programs that were focused on the powerful and sophisticated nuclear weapons of the Soviet Union, which we expected to be employed overtly, as opposed to the crude or improvised weapons currently attainable by rogue states and terrorists.

Further complicating our ability to adapt our countermeasures to the evolving WMD environment is the likelihood that the United States will not always lead in technological innovation. Other nations increasingly play leading roles.

Moreover, government-affiliated scientific talent in the United States has been shrinking in critical areas for a generation. Today, most of those scientists are retired or are approaching retirement. The number of scientists with detailed knowledge of the nuclear weapons design process is declining rapidly, and there are even fewer with an understanding of how an adversary might develop and test chemical and biological weapons. The United States must find new ways to harness its scientific ingenuity and legacy.

A more proliferated world. The vast majority of states have rejected, and we hope will continue to reject, nuclear, chemical, and biological weapons, but the latent

capacity to produce such weapons is reaching unprecedented heights. The steady progress of technology brings not only the danger of new weapons in the hands of new actors, but also a new context in which proliferation will occur. Increasingly, these technologies belong not just to the few, but to the many states with the capacity for modern medical science, pharmaceutical and chemical industries, and nuclear energy. A state with a space-launch capacity has a virtual long-range ballistic missile capability, just as the proliferation of unmanned aerial vehicles (including in civilian roles) provides new and effective means to deliver chemical and biological weapons. A state with an indigenous nuclear fuel cycle capability is well on its way to having nuclear weapons; and for states with modern pharmaceutical or chemical industries, the ability to possess biological or advanced chemical weapons is limited far more by intent than capability.

There are other worrisome trends. Evidence suggests that in some regions the taboos associated with nuclear weapons are weakening, while the perception of prestige and security benefits is on the rise. Also, complex network dynamics are changing the ways states can acquire nuclear capabilities and marginalizing traditional control mechanisms. The discovery of the A.Q. Khan network exposed weaknesses in the nonproliferation regime's ability to detect and prevent black market transactions in nuclear technology, design, and expertise. Moreover,

an increase in nuclear proliferation may also help renew interest in biological and chemical weapons as the "poor man's nuclear weapons."

Finally, as WMD-enabling technologies become more widely proliferated, the opportunity for theft, leakage, or transfer to other state or nonstate actors can only grow. Weak or unstable regional nuclear powers may lack sufficient safety and security controls over their nuclear weapons, materials, or equipment. The collapse or compromise of a WMD-armed state could lead to the sudden and potentially catastrophic leakage or transfer of WMD capabilities to terrorists or state actors.

Evolving adversaries. Finally, perspectives on the nature and character of the future threats posed by nuclear, chemical, and biological weapons are fundamentally shaped by the evolving views of those who might use them. The 1990s were marked by growing concern that smaller hostile or rogue states might seek to acquire and use chemical, biological, or even nuclear weapons as an asymmetrical counterweight to U.S. conventional dominance or as a means to intimidate regional rivals. Such states may or may not be susceptible to the pressures of traditional retaliatory deterrence; therefore, the U.S. military had to prepare to fight under chemical, biological, and nuclear conditions. Following 9/11, the focus immediately shifted to terrorists as the primary locus of the threat. The growing conventional wisdom was that

terrorist use of WMD could not be deterred through fear of retaliation. This shift in emphasis brought greater reliance on deterrence through denial—detection, defenses, interdiction—in hopes of denying the opportunity for a successful attack. Without question, terrorist use of nuclear or biological weapons remains the most critical near-term WMD threat. This immediate threat, however, obscures the likelihood that over the longer term the United States will need to deal with a variety of state and nonstate actors operating in a more multipolar world marked by increased conflict over natural resources. Such trends could again reshape views on the role of deterrent forces, complicate international nonproliferation cooperation, and stoke military competition. By preparing tools and strategies overly focused on the terrorist threat, the United States risks finding itself dangerously flat-footed as it seeks to deal with future dangers.

First Principles

The evolving nature of the threat requires us to return to first principles in countering weapons of mass destruction. The four scenarios mentioned above and presented in greater detail in separate sections provide a baseline of possibilities from which a host of requirements could flow. Most of the scenarios point to the need for complex, sophisticated responses that would overwhelm current capacities. Over the next few years, the United States must

consider its preparedness to respond to each scenario and develop appropriate strategies, plans, and capabilities.

Successful *prevention* must form the backbone of our response. As it is nearly impossible to protect and monitor thousands of miles of coastline and land crossings, hundreds of ports, scores of airports, and dozens of national icons, preventing an adversary from acquiring WMD offers the greatest return on investment. Successful prevention will reassure allies and friends that they can depend on the United States for their security and do not require their own nuclear weapons. It will persuade others, both state and nonstate actors, to stop or reverse WMD acquisition, or impede those who continue to pursue these capabilities. And it will enhance international support for measures to strengthen regimes and initiatives to support nonproliferation goals.

Prevention is unlikely to succeed in all cases. Consequently, proliferation almost certainly will be a permanent characteristic of the security landscape. We must therefore be concerned with defending against successful WMD use upon the United States or its allies. Successful *defense* will identify state and nonstate actors that possess and may use WMD. It will detect and stop the movement or transfer of these weapons and related materials; secure the national border against WMD entry by air, land, or sea; prepare U.S. forces, citizens, allies, and partners to deal with the consequences of an attack through planning and training; deter state and nonstate actors from

WMD use through both retaliatory response and denial; and protect U.S. forces, citizens, and partners through active and passive defenses. Defense will require integrated government-wide strategies and capabilities.

Successful defense may not be possible under all circumstances. The United States must be able to offer effective *response* in the event that WMD use occurs. Successful response will entail assuring U.S. citizens and partners that the United States can withstand an attack and cope effectively with it; provide care for victims and restore essential services; encompass surging detection and other capabilities in anticipation of additional attacks; identify the source and nature of the attack so additional attacks can be stopped and perpetrators can be punished; and assist allies and friends if they are attacked or threatened. Successful response will sustain critical global operations despite WMD attacks on the United States, its allies, or its partners.

Taken together, *prevention*, *defense*, and *response* form the conceptual fundamentals and first principles for organizing an effective framework for countering WMD.

How to Succeed

Addressing the WMD threat requires complex, multifaceted responses that engage numerous actors, organizations, and interests. It calls for successful execution of multiple, simultaneous activities. The United States must be concerned with threats from both terrorist and

state actors, from either home or abroad, and demand both civilian and military responses.

Preventing the further spread of these weapons and capabilities can only be accomplished through the active engagement of the international community using all means at its disposal. Despite our best efforts, prevention is unlikely to succeed in all cases. Unfortunately, proliferation is an enduring characteristic of our security landscape.

Where proliferation cannot be prevented or reversed, Washington must seek to deter use of these weapons and, where possible, ensure their safety, security, and accountability. Moreover, the United States must protect itself, its interests, and its forces, thereby denying adversaries the benefits they seek through actual or threatened WMD use. Furthermore, a robust, layered defense can reduce the consequences of threatened or actual use and also enhance deterrence by altering the potential user's calculus of the effectiveness and utility of such weapons. Finally, the Nation must be able to respond to WMD use, actualized or imminent, to mitigate its effects, attribute the perpetrator, and prevent follow-on attacks.

This task is large and complex, stressing current organizations, strategies, capabilities, and concepts. Success will require innovative thinking, broad interdepartmental cooperation, and effective allocation of resources. The following guiding principles should help

shape national strategy, guide interagency processes, and establish priorities across this vast mission space.

Differentiate WMD. While WMD is a useful term to distinguish the unique challenges posed by chemical, biological, radiological, and nuclear (CBRN) weapons from those of conventional weapons, success in countering WMD begins with understanding that their different types act on the basis of different physical principles and inflict damage by different mechanisms. Nuclear, chemical, and biological threats entail unique characteristics and require distinct responses. In many cases, CBRN policies and programs involve entirely different policy or expert communities.

Establish a common strategic framework and lexicon. A common strategic framework and lexicon for thinking and communicating about WMD are vital to an integrated government-wide response. The articulation of the new counterproliferation concept in the early 1990s extended the longstanding nonproliferation strategic framework to address new threats. The 2002 National Strategy for Combating WMD integrated counterproliferation with nonproliferation and consequence management under a unified construct of combating WMD. Those terms, however, continue to mean different things to different people, while new terminology is featured in some subsequent strategy documents. It is time to get everyone back on the same page with a common framework and terms of reference.

Achieve a balance within the prevention, defense, and response framework. To date the nuclear community has placed too much emphasis on prevention and the biological community too much on response. National leaders will be well served only if all aspects of the framework are addressed with appropriate balance.

Engage in practical international cooperation. Practical international cooperation is essential to countering a WMD threat that emanates from diverse parts of the globe and exploits the resources, territory, and networks of many nations. New international initiatives and programs, like United Nations (UN) Security Council Resolution 1540, the Global Partnership against the Spread of Weapons and Materials of Mass Destruction, the Proliferation Security Initiative, and the Global Initiative to Combat Nuclear Terrorism, manifested a more robust international consensus on the WMD threat, at least from terrorists, and provided a valuable practical complement to the legal, regulatory, and normative power of international nonproliferation regimes and agreements. International partners look to the United States for leadership in sustaining and building upon these efforts.

Use a whole-of-government approach. A coordinated whole-of-government approach is a prerequisite for success in countering WMD. The 9/11 terrorist attacks accelerated and recast earlier efforts to broaden the fight against WMD beyond the traditional national security

organizations to involve the larger interagency community. Domestic agencies and the traditional national security agencies routinely interact and cooperate on WMD, but the whole-of-government approach is still in its infancy, and more needs to be done. This problem is particularly acute in the homeland security arena, since all too many fail to understand the extent to which homeland security is a national responsibility and not the sole purview of the Department of Homeland Security (DHS). Moreover, domestic response is complicated by our Federal form of government, which makes state, local, and tribal governments responsible for much of our response effort.

Close the capability gap. Policy and process provide the foundation for countering WMD, but success cannot be achieved without effective programs and specialized capabilities. While a number of valuable programs and capabilities to counter WMD have been established or significantly enhanced in recent years, serious capability and capacity gaps remain in many areas, such as detection, interdiction, attribution, and consequence management.

Prepare for large-scale WMD contingencies. The failure of a WMD-armed state and the catastrophic use of such weapons in the United States or abroad are real possibilities for which Washington and its allies and partners are ill prepared. The U.S. response to such contingencies will depend on the achievement of complex, multifaceted

operations requiring unprecedented levels of planning and coordination across bureaucratic boundaries. For the military these contingencies will challenge a system designed for regional conflict by requiring multiple, simultaneous operational activities on a global scale. They will demand more military units and domestic emergency response teams with specialized WMD capabilities than currently exist. Shortfalls are particularly pronounced in the areas of WMD elimination, consequence management, and attribution. Large-scale contingencies will require more sophisticated, regularly exercised capabilities in every phase of operational planning. They will demand more integrated activity across the executive branch and the Federal, state, and local levels of government than is the case today, and they will call for a broad range of political-military responses. In addition, effective response to catastrophic WMD attacks requires the U.S. Government to harness the resources of the private sector more effectively.

Ensure a safe, secure, reliable deterrent. In almost any policy direction the new administration leans, maintaining a nuclear deterrent that is safe, secure, and reliable for the long term will remain a critical aspect of the overall approach to dealing with WMD threats. It is the foundation upon which the United States can commit to further reductions in nuclear weapons stockpiles; avoid a resumption of nuclear testing; maintain a nuclear weapons posture that minimizes the likelihood of inadvertent,

unauthorized, or ill-considered use; improve the security of existing nuclear weapons and related capabilities; and reduce incentives and opportunities for the proliferation of nuclear and other WMD.

Raise leadership awareness of WMD matters. Educating military and civilian leaders on the nature of the WMD threat and effective responses thereto is an important component of remedying the shortfalls in U.S. WMD preparedness and in sustaining and adapting those remedies over time. Change will not come about without informed leadership. Today, few general and flag officers have professional experience in or more than a rudimentary exposure to the WMD area. This reflects the deemphasis of the nuclear, chemical, and biological missions in the U.S. military since the end of the Cold War. Among civilian leaders, the cadre of experts remains small. WMD needs to be a core requirement in the education of emerging leaders in the national security and homeland security arenas. Throughout the Federal Government, WMD knowledge needs to be transformed from a specialized subject matter to a broader area of consideration and expertise.

Next Steps

1. Develop and promulgate a comprehensive strategic framework for the WMD challenge that can be used across the entire government. This must include clear definitions for key terms and concepts.

2. Conduct a comprehensive, government-wide capability inventory designed to identify gaps and shortfalls in meeting the WMD challenge and to establish requirements to remedy them. First priorities should include operational capabilities for interdiction, elimination, and consequence management and technical capabilities for detection, forensics, and medical countermeasures.

3. Prepare senior leaders for WMD contingencies using scenario-based table-top exercises and simulations designed to work through issues and requirements.

4. Improve processes and procedures for coordinating responses to WMD contingencies both within and among key Federal agencies. Within the Executive Office of the President, the administration should better integrate WMD portfolios associated with proliferation, homeland security, and counterterrorism. Agencies should establish single points of contact for interagency cooperation on countering WMD.

5. Develop an overall international engagement strategy to enhance and integrate the full range of international efforts to address WMD challenges.

COLLAPSE OF THE NONPROLIFERATION REGIME

The crisis scenario. *The nonproliferation regime is in crisis as events in both the Middle East and East Asia point toward a growing risk of WMD proliferation. Extended negotiations with the Iranians have failed to slow Iranian progress toward "peaceful nuclear enrichment." In recent weeks, U.S. intelligence has observed movements consistent with the early stages of nuclear test preparations and current assessments warn that Iran may be ready to test a nuclear device within 24 months. These events come on the heels of a 2009 International Atomic Energy Agency (IAEA) report on the suspected Syrian nuclear facility at al-Kibar, which was bombed and destroyed by the Israelis in September 2007, failing to confirm the presence of an illicit nuclear reactor at the site. Claiming a lack of cooperation from the Syrian government and citing the level of destruction caused by the Israeli raid, the IAEA Director reported that the "true nature of the facility, while suspicious, can never be known."*

Meanwhile, concern is growing that North Korea has been supplying missile and nuclear technology to Iran, Syria, and other countries. Unable to forge a consensus on these issues, a Preparatory Committee for the 2010 Nuclear Non-Proliferation Treaty (NPT) Review Conference

ended abruptly as various parties to the treaty blamed one another for failing to do enough to uphold the treaty. The 2010 Review Conference is now in serious jeopardy. In recent days, several allies have approached the United States requesting a more tangible representation of U.S. security commitments, including with regard to the U.S. nuclear umbrella. Moreover, intelligence reports suggest that one ally's military leadership is reconsidering an indigenous nuclear weapons capability. Off-line consultations with the Israelis suggest that should the United States fail to prevent an Iranian nuclear test, the Israeli military will have no choice but to respond preemptively. Increasingly, the United States and its allies have begun to fear the imminent collapse of the nonproliferation regime.

Policy Implications

Today, the nonproliferation regime—namely the broad international commitment to preventing proliferation of nuclear weapons as enshrined in the nearly universal Non-Proliferation Treaty—is under considerable strain. Some combination of events similar to those described above is certainly plausible, if not likely, over the next 24 months. If not managed quickly and effectively, this scenario could easily spiral into an even more dangerous crisis—a breakout or cascade of new nuclear proliferation accompanied by heightened regional tensions and the possibility of conflict between WMD-armed states.

This course of events could have a profoundly negative impact on the international system and dash any prospects for a less nuclear world. There are several implications of such events:

- There is substantial risk that escalatory behavior could lead to regional conflict among WMD-armed countries in either Asia or the Middle East.
- Risks of WMD use could grow substantially. With leaders inexperienced in handling WMD, there is a danger that at least some of these countries would employ such weapons. In turn, countries victimized by WMD attacks would be tempted to launch retaliatory WMD strikes. As a consequence, regional conflicts will become far more dangerous.
- Erosion of the taboo against WMD use would make the international system far less secure for all parties and increase prospects that the United States, its allies, or coalition partners could be targeted by such weapons.
- At the same time, the pressure for Washington to provide credible and reliable security assurances could grow substantially, perhaps placing the United States in the cross-hairs of regional conflict and forcing difficult choices between our involvement in such conflicts and our ability to slow the march to greater nuclearization in Asia and the Middle East.

- Proliferation of WMD increases opportunities for terrorist groups to obtain access to WMD given that some states are unlikely to secure their stockpiles, either because of internal political turmoil or poor security procedures.
- This more WMD-armed world would severely constrain U.S. freedom of action in protecting and advancing its interests worldwide. The effectiveness of Washington's security guarantees would diminish as allies and coalition partners worry that the American people may not want to confront WMD-armed adversaries when the result may be WMD threats to the U.S. homeland.
- Expansion of nuclear proliferation would increase incentives for some countries to acquire biological and chemical weapons as the "poor man's nuclear weapons." Biological and chemical weapons are more easily acquired because the technology is globalized and much of it is used for legitimate peaceful purposes.

Response Requirements

Managing such a crisis and preventing an uncontrolled spiral of nuclear proliferation and the associated consequences will require the effective and timely use of a broad range of diplomatic, military, and economic tools as well as juggling conflicting and contradictory

requirements. While the requirements generated by this scenario differ substantially from the operational needs associated with a nuclear or biological attack or the collapse of a WMD-armed state, it remains a complex, large-scale WMD contingency demanding a broad range of responses in multiple theaters and engaging broad aspects of the interagency apparatus on a simultaneous or near-simultaneous basis.

In response to such a scenario, the United States must:

- reassure allies of the U.S. commitment to their defense and security
- convince international partners to join in a collective response to the provocations of Iran and North Korea
- persuade international partners that the nonproliferation regime remains intact and that additional proliferation can be recognized and stopped
- prevent the testing of nuclear weapons by Iran
- prevent the transfer of WMD technology and expertise to other state or nonstate actors through both diplomatic and operational means
- ensure that states exercise restraint in response to their regional security concerns to prevent escalations of the crisis.

Avoiding or managing such a crisis demands innovative nonproliferation strategies and resources as well as new deterrence concepts and capabilities. Most importantly, it requires effective planning and execution and the ability to deliver holistic integrated responses in a complex global crisis.

Where We Stand Today

Nuclear Proliferation

Anxiety about nuclear proliferation has risen sharply in recent years, prompting growing concern that in the future the United States may face a world in which significantly more countries possess nuclear weapons, terrorist acquisition of nuclear weapons becomes an increasingly likely prospect, and the use of a nuclear weapon against the United States or its interests is more a matter of when than if. The sources of this deepening nuclear angst are many. First, the nuclear programs of North Korea and Iran raise serious concerns about these countries not only as proliferators, but also as adversaries. North Korea and Iran may become the first new nuclear-armed adversaries in decades. Revelations of al Qaeda's keen interest in acquiring nuclear weapons following the September 11 attacks confirmed fears of a possible terrorist use of nuclear weapons against the United States.

Increased proliferation among unstable states such as Iran and particularly North Korea raises fears about the security of nuclear arsenals. These states, along with one or two established nuclear powers, probably lack the level of physical security that other established nuclear weapons states have developed and, perhaps more relevantly, they lack political structures that are seen as legitimate either within their populations or by the international community. Perceptions of illegitimacy, combined with increasing tendencies to use strong-arm tactics to maintain political control, raise questions about long-term regime stability. Should weak states with nuclear capabilities collapse into competing factions, multiple successor states, or failed, ungoverned areas, the possibility of their nuclear capabilities being stolen, sold, or diverted to nefarious state actors or terrorist groups would grow significantly.

There are currently seven countries that unambiguously possess nuclear weapons and at least two whose nuclear weapons status is ambiguous. One estimate of the global inventory of nuclear weapons is shown in the table that follows.

Concerns about a renewed wave of nuclear proliferation have grown dramatically—largely prompted by the advancing nuclear programs of Iran and North Korea. In the Middle East, at least 11 countries have expressed an interest in obtaining nuclear power reactors—prompting concern that they might be motivated, at least in part, by a desire to develop nuclear weapons programs. Syria's

Country	Warheads	
	Operational	Total
Russia	5,200	14,000
United States	4,075	5,400
France	300	300
China	about 176	about 240
United Kingdom	fewer than 160	about 200
Israel	about 80	about 80
Pakistan	about 60	about 60
India	about 50	about 50
North Korea	<10	<10
Total	10,100	20,350

Source: Adapted from Federation of American Scientists/National Resources Defense Council, "Status of World Nuclear Forces 2007," available at <www.nukestrat.com/nukestatus.pdf>, and from various reports in *Bulletin of the Atomic Scientists*.

apparent construction, possibly with North Korean assistance, of a nuclear reactor that may have been modeled on the Yongbyon facility is a most alarming development. In East Asia, while both the Japanese and South Korean governments affirm their strong commitments to a nonnuclear status, numerous factors point to their growing insecurity about the reliability and credibility of U.S. extended deterrence as a substitute for an indigenous nuclear weapons capability. Elsewhere around the world, retained stocks of weapons-usable materials and indigenous fuel cycle ca-

pabilities raise concerns that latent capabilities facilitate nuclear hedging and risk theft or leakage to nonstate actors.

Chemical and Biological Weapons Proliferation

The United States believes that a small number of countries continue to maintain offensive chemical and biological weapons programs. This list is shorter than it was a decade ago, but the intelligence underlying this assessment is limited and of uncertain quality. Unlike nuclear weapons, chemical and biological weapons are comprehensively prohibited by international conventions, to which most nations are signatories. Only five nations—Angola, Egypt, North Korea, Somalia, and Syria—are not signatories to the Chemical Weapons Convention (CWC); Israel and Burma have signed but not ratified the convention. Syria and North Korea have long been assessed as maintaining major chemical weapons stocks for offensive purposes. Twenty states remain outside the Biological and Toxin Weapons Convention (BTWC), most of which are small countries in Africa or the Pacific; Israel is the only major nonsignatory state. Comprehensive prohibition reflects and reinforces a strong international norm against possession as well as use. Moreover, chemical and biological weapons are not associated with great power status or technological prowess as are nuclear weapons. There is little political upside and much downside 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 as legacy weapons. To the extent that any country is pursuing biological weapons, it is doing so on a covert basis.

According to the State Department's 2005 treaty compliance report, the list of countries of concern includes China, Cuba, Iran, North Korea, Russia, and Syria. Iraq and Libya are now believed to be in compliance with their BTWC commitments. The State Department list includes only countries party to the BTWC; according to some reports, Israel, which has not joined the BTWC, has an offensive biological weapons (BW) program. The State Department's 2005 treaty compliance report lists China, Iran, and Russia as not in compliance with their obligations under the Chemical Weapons Convention, and expresses concerns about Sudan. Libya is now believed to comply with its CWC commitments, and Albania completed destruction of its chemical stockpiles in 2007. There are residual concerns regarding India and Pakistan. Relatively recent nongovernment sources mention other countries as well, including Egypt and Israel. In addition, the United States remains concerned that several countries not parties to the CWC may possess chemical weapons programs, including North Korea and Syria.

Chemical and biological weapons programs generally are pursued covertly and are easily concealed. The programs can be hidden 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 BTWC has no enforcement mechanism, and no challenge inspection has ever been conducted under the CWC enforcement apparatus. In the chemical arena, manufacturing has globalized. Production is no longer 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.

As discussed in the Report of the Scientific Advisory Board on Developments in Science and Technology for the second review conference of the CWC (SAB Report), production facilities are also getting smaller and utilizing new technology. Individual plants used to focus on the bulk production of a few chemicals; modern plants can economically and quickly produce a wide range. As more individuals in more countries are involved in chemical production, there will emerge inherently greater scope for chemical weapons activity. It may also be harder to detect illicit activity, particularly in smaller chemical plants utilizing new technology, at least with the means currently used by inspectors for the Organization for the Prohibition of Chemical Weapons (OPCW).

Also discussed in the SAB Report, the rapid pace of technological innovations is reshaping the parameters of chemical weapons threats. New tools, including robotics, microreactors, and ever more powerful computing capabilities, have dramatically increased the number of chemical compounds that can be synthesized and the rate at which they can be developed and screened. Commercial entities are creating large libraries of new compounds, some of which may be highly toxic and useful for weapons. Nanotechnology is another rapidly developing area with important implications for chemical warfare, particularly the identification and development of new or improved dissemination techniques, which build on ongoing work to use nanotechnology to enhance the delivery of drugs for therapeutic purposes. There is also a growing convergence of chemistry and biology.

The rapid pace of development in the biological sciences and biotechnology is making the expertise and technology to produce biological weapons more accessible and may also be enabling new types of weapons. New classes of infectious agents have emerged, including prions, viroids, and satellite viruses/nucleic acids. The relatively new fields of synthetic biology and bioengineering have already enabled scientists to create the polio virus from scratch and in the not distant future may enable "from scratch" creation of more pathogenic viruses such as smallpox (which no longer exists in nature), as well as

the engineering of new organisms, some perhaps conducive to weaponization. Organisms potentially relevant to biological weapons are available throughout the world—in nature, laboratories, and type collections. Most of the requisite expertise and equipment for biological weapons is 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.

The Future Proliferation Threat

Over the longer term, the availability of critical technologies coupled with changing views and attitudes involving nonproliferation norms and standards could greatly complicate U.S. ability to develop effective nonproliferation policies, plans, and strategies. The vast majority of states have rejected, and will continue to reject, nuclear, chemical, and biological weapons, but the latent capacity to produce such weapons can only increase in the coming years. Moreover, the environmental concerns and political ideals that inhibited proliferation (and the pursuit of nuclear energy more generally) in the 1970s and 1980s have receded, while at the same time, the expanding energy crisis and renewed focus on

nuclear energy may increase the availability and feasibility of critical technologies and expertise around the world.

Evidence in some parts of the world suggests a weakening of some norms and taboos that helped stop nuclear proliferation while at the same time the benefits and added prestige of having such weapons are seen as more compelling. Today, nationalist, Islamist, and/or populist political trends favor rather than dissuade nuclear proliferation, particularly in the Middle East. Also, complex network dynamics are changing the ways that states can acquire nuclear capabilities and marginalizing many traditional control mechanisms.

A nuclear cascade might also increase incentives for some countries to acquire biological and chemical weapons as the "poor man's nuclear weapons." Biological and chemical weapons are more easily obtained because the technology is globalized and much of it is used for legitimate peaceful purposes. Countries desiring a counterweight to an adversary's nuclear weapons may feel compelled to seek chemical and biological weapons as strategic deterrents, as Syria has long relied on chemical weapons as a deterrent to Israel's suspected nuclear arsenal. Finally, in this more "WMD-capable" world, the opportunity for theft, leakage, or transfer of these capabilities to other state or nonstate actors can only increase.

We must expect that the introduction of new nuclear weapons–capable states into already troubled or unstable

regions will have serious consequences both for global nonproliferation and disarmament efforts and initiatives to reduce regional conflict. It is in this context that the danger posed by North Korea's pursuit of nuclear weapons and the concern that Iran will do likewise must be viewed. If Iran continues along the path to nuclear weapons, how will Saudi Arabia, Syria, Turkey, Egypt, and other states in the region respond? Will we know if these states pursue nuclear weapons or will they slip past our view until it is too late? In addition, how long can the United States and the international community stand by while North Korea repeatedly exports controlled technologies, possibly including nuclear technologies, to states such as Syria and Iran?

We also must be concerned about how friends and allies of the United States will respond to these changing security conditions. While most states in the Middle East are many years from an indigenous nuclear weapons capability, states such as Japan have a high level of nuclear latency and considerable anxiety about their security environment. Reportedly, both civilian and military leaders in South Korea are concerned that Washington is stepping away from its commitments to the defense of the peninsula—a concern exacerbated by the planned transfer of operational command from the United States to South Korea in 2012 and reductions in U.S. ground forces. Whether in the Middle East or East Asia, when will

a "tipping point" be reached when broader proliferation, particularly in the nuclear arena, becomes unstoppable? The answer is uncertain, but it is clear that as a nation we cannot afford to find out.

Gaps and Shortfalls

Lack of integrated responses. Being prepared for and responding to a crisis such as the above demands a whole-of-government approach designed to integrate a comprehensive diplomatic strategy with clearly identified and coordinated military responses and options. How else can the U.S. Government ensure that its regional military engagement plans and extended deterrence strategies with key allies operate in concert with its multilateral nonproliferation agenda? How else can the President leverage interdiction capabilities in the defense and intelligence arenas to persuade potential proliferators that their activities are likely to be detected and interrupted and encourage them back into the nonproliferation fold? Currently the ability to deliver such an integrated approach is nonexistent in the interagency process below the Deputies level.

Neglect of the state problem. The potential for WMD terrorism has been the dominant WMD-related concern for the U.S. Government for the last several years. This near-term threat obscures the likelihood that over the longer term the United States will need to deal with a

WMD threat that emanates from a variety of state and nonstate actors simultaneously. This concern will be exacerbated if, as the recently released *Global Trends 2025* report suggests, Washington is likely to face a more multipolar world marked by greater competition for and conflict over resources, food, and water. These challenges would certainly be complicated by increasingly assertive regional powers such as Russia, China, and Iran. Such trends could again reshape views of the major sources of threats to the Nation, affect the focus of deterrence and the role of U.S. deterrent forces, complicate international cooperation in the proliferation arena, and stoke conventional and strategic military competition in several regions. By preparing tools and strategies solely focused on the terrorist threat, the United States risks finding itself dangerously flat-footed as it seeks to deal with future threats.

Lack of capability to hold emergent WMD capabilities at risk. Diplomatic, economic, and other nonmilitary approaches will be any President's first choice when responding to emergent proliferation risks. In most cases, however, diplomatic efforts to dissuade potential proliferators would be greatly enhanced by credible military options to hold such capabilities at risk. Today, those capabilities are highly limited and in many cases would entail unacceptable risks of collateral damage. Moreover, with the U.S. military stretched over ongoing wars in Iraq

and Afghanistan, threatened military responses to proliferators such as Iran and North Korea lack credibility. Capabilities that enhance U.S. ability to detect, track, and interdict proliferation activities are essential. In addition, the U.S. military lacks sufficient counterforce and long-range strike options to disrupt and destroy adversary WMD capabilities while minimizing collateral damage.

What Needs to Be Done

Do not concede defeat. Even if Iran and North Korea never reverse course, the high price they pay for their nuclear programs has a dissuasive effect on other nations, especially in terms of sanctions.

Identify the next wave of proliferation and intervene early. The United States must act now to ascertain and influence decisionmaking by potential future proliferators—that is, those beyond North Korea and Iran. Washington must do better at anticipating possible regional and global reactions to proliferation and prepare to intervene sooner rather than later. Specific recommendations include:

- Accelerate the pace of future proliferation risk assessments throughout the Intelligence Community. Some "over the horizon" efforts are under way, but more is needed faster.
- Develop more effective assessment tools and analytical models for monitoring nuclear "intent."

- Diffuse catalytic and competitive reactions that fuel regional proliferation pressures, especially in the Middle East, through regional and subregional transparency initiatives, mutual assurance and inspection regimes amongst key countries, joint accounting and control commissions, and other high-level dialogues between principal leaders in the region.

Deny access to key technologies as long as possible. Steps to reinforce the fissile material barrier are critical, especially in the Middle East where, outside of Iran and Israel, national fuel cycle capabilities remain low. The expansion of nuclear energy in the region may be unavoidable, but it must be accompanied by stronger incentives for countries to forego full fuel cycle capability, including:

- improved fissile material controls and accountability accompanied by substantial increases in financial incentives for countries to participate in fuel cycle alternatives
- renewed efforts within the UN and IAEA to expand initiatives designed to steer countries away from enrichment and reprocessing and to bolster legal interpretations of the NPT that rebut the notion of a "sovereign right to the nuclear fuel cycle," perhaps via Security Council statement

- increased U.S. partnerships with, and guidance of, civilian nuclear power efforts in the Middle East to give the United States insight into and influence over nascent weapons-related programs, ensuring that "civilian nuclear energy" efforts remain both "civilian" and about "energy"
- expanded material stockpile security initiatives and source transparency regimes
- substantial increases in responsible stockpile stewardship initiatives, including expanded security requirements for Kazakhstan, South Africa, and other states that choose to retain stockpiles of weapons-useable materials; these efforts would not only reduce risk of transfer but would also raise the penalty bar for stockpile retention
- strengthened controls on ballistic and cruise missile technology in order to impede parallel development of more effective means of delivery of nuclear, chemical, and biological weapons.

Strengthen multilateral nonproliferation tools. This should include bolstering the multilateral treaties such as the BTWC, the CWC, and the NPT and enhancing the effectiveness of organizations designed to support the treaties (the IAEA for nuclear weapons and the OPCW for chemical weapons). This should involve:

- sustaining the commitment to secure universal adoption of, and adherence to, the NPT Additional Protocols
- reinforcing the norms against chemical and biological weapons through enhancements to the BTWC work program and strengthening of CWC enforcement mechanisms
- developing an integrated international engagement strategy intended to strengthen norms against the misuse of biology and to enhance cooperation against disease outbreaks that arise from either natural sources or intentional attacks.

Emphasize policies to dissuade friends and allies from developing or increasing nuclear weapons–relevant capabilities. Numerous nuclear break-out scenarios involve U.S. friends and allies. Assuring such parties that the United States is a committed and reliable security partner must be a central element of U.S. nonproliferation policy. Washington must take a broad range of steps to bolster confidence and assure allies that an independent nuclear weapons option is neither necessary nor in their national interest. Specific steps include:

- requiring regional commanders to develop a proliferation engagement plan and report on outcomes as a condition of regional engagement funding

- creating a high-level (Secretary of Defense) allied engagement initiative on proliferation-related issues for Europe, East Asia, and the Middle East
- increasing collaboration on WMD defense efforts, particularly missile defenses in Europe, the Middle East, and East Asia
- reinvigorating U.S. security assurances to bolster confidence in U.S. extended deterrence, with first priority to Japan, South Korea, and Turkey
- initiating a study of allied confidence in and perceptions of the credibility of U.S. extended deterrence, including direct and high-level interaction with allied counterparts on the nature and role of our nuclear deterrent.

Develop tailored regional and country-by-country proliferation prevention plans that account for widely divergent capabilities, intent levels, security requirements, and incentive structures.

- ***Latin America.*** Nonproliferation efforts in Latin America should focus on reinforcing the nonproliferation norms, including the Latin American Nuclear Weapons Free Zone, as well as efforts to support and foster latent antinuclear sentiment in the region. Attempts must be made to bring more of Brazil's nuclear infrastructure under safeguards and encourage

compliance with the Additional Protocols while at the same time addressing Brazil's need for recognition on the world stage. U.S. policy should emphasize alternative paths to global respect and leadership not predicated on nuclear weapons and ways of integrating Brazil's economy into the global system so the loss of foreign trade and investment would be crippling should Brazil pursue nuclear weapons.

- ***East Asia.*** The United States should initiate a high-level dialogue regarding the long-term credibility of extended deterrence and the health of our strategic partnership with regional allies. Any changes to U.S. strategic posture must include detailed and timely consultations with our Asian allies. In addition, Washington should engage regional partners in a dialogue on the dangers of "virtual" nuclear weapons.

- ***Middle East***. Efforts to prevent proliferation in the Middle East should place renewed focus on regional transparency and confidence building, especially among potential secondary proliferators such as Saudi Arabia, Syria, Turkey, and Egypt. In addition, Washington should initiate dialogues with regional partners to assess their specific security concerns with regard to Iran's nuclear program and how those concerns could be addressed without resorting to WMD acquisition. Such discussions could engage the possibility of the

United States' explicitly extending its nuclear deterrent to some regional allies/partners.

Enhance capabilities needed to hold emerging WMD capabilities at risk through detection, interdiction, elimination, counterforce, and attribution. Countries that believe they risk detection and exposure of illicit proliferation short-cuts are far less likely to pursue them. In addition, the ability to locate, characterize, secure, destroy, or disable nuclear weapons–related capabilities when U.S. interests are directly threatened is critical both to dealing with and preventing a proliferation cascade. We should make targeted investments in technology in high-payoff areas such as:

- capabilities needed to disrupt and destroy adversary WMD and associated delivery systems during combat operations
- technologies to secure, neutralize, disable, and destroy WMD materials, facilities, and components both in proximity (covert or overt) and from a distance
- technologies necessary to assess and attribute key components and materials associated with WMD weapons or programs rapidly and under hostile field conditions.

Partner with the private sector to help it remain highly competitive and cutting edge in advanced biochemical research and to gain knowledge and insights needed to support robust chemical and biological de-

fense 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.

Expand government research into emerging chemical and biological weapons threats. More research must be 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 is particularly valuable in this regard. Greater attention should be devoted to a counterpart effort on chemical threats.

Develop a comprehensive, integrated strategic communications strategy regarding nuclear proliferation. Essential elements of a nonproliferation communications strategy include:

- strong statements of U.S. commitments to nonproliferation norms and standards
- better identified and communicated red lines and standards for international conduct
- accountability standards for states that lose control of materials or weapons

- U.S. nonacceptance of regionally based nuclear security assurances (dual key arrangements, alternative sources of extended deterrence)
- holding states accountable for transfers of critical capabilities (fissile material, fuel cycle technology, weapons development capabilities).

FAILED WMD-ARMED STATE

The crisis scenario. *A state known to possess a nuclear weapons capability and suspected of possessing both chemical and biological weapons programs stands on the brink of political collapse. Centralized governance has ceased to function as various regions are now under the effective control of different military, tribal, and religious leaders. Some factions are sympathetic to the United States and its allies, but others are hostile. Factional violence has erupted in several areas and there have been large outflows of civilians fleeing a feared civil war. There are numerous indicators that potentially hostile nonstate actors are operating in and near suspected WMD-related facilities, but detailed, actionable information on the exact nature of the country's WMD programs and capabilities and the locations of key personnel, materials, and even weapons is limited and inconsistent. Many suspected WMD facilities are in areas controlled by hostile elements where terrain and access are particularly challenging. According to some analysts, the transfer of nuclear material or technology is imminent or may have already transpired.*

The United States is working closely with allies and friendly governments to respond to the crisis by providing humanitarian assistance, enhancing border security, and surging WMD detection capabilities to the area; however,

difficult terrain and long, unmonitored border areas are complicating efforts to detect and prevent the movement of WMD-related capabilities. In addition, as uncertainty about the security and location of WMD-related weapons and capabilities has grown, U.S. officials are increasingly concerned about the prospect of a nuclear or biological terrorist attack against the U.S. homeland or interests overseas. In light of these concerns, the Department of Homeland Security has raised the National Threat Advisory from Elevated to High, and U.S. Northern Command (USNORTHCOM) has raised its chemical, biological, radiological, nuclear, and explosive (CBRNE) response level from 4 to 2, thereby increasing the readiness of some Department of Defense (DOD) units to provide support to civil authorities in the event of a WMD incident at home.

In addition, regional powers sharing a common border with this state are apprehensive about the prospect of large refugee outflows as well as terrorist attacks emanating from the crisis. Intelligence suggests that one or more of the adjacent countries is preparing to move military assets into the border regions in response to the crisis. The United States is readying forces to support efforts to locate and secure WMD capabilities, but is awaiting an invitation from friendly governments or the United Nations before deploying them. The UN Security Council is expected to convene a special session on the crisis within the next few hours.

Policy Implications

The collapse of a WMD-armed state leading to the proliferation of dangerous nuclear, chemical, or biological weapons capabilities poses a daunting threat to international security and a grave danger to U.S. interests and security both at home and abroad—a threat for which the United States is dangerously unprepared. Unfortunately, such a scenario is a real and present danger in at least two regions and a growing threat in a world of increasing nuclear, chemical, and biological weapons proliferation. Concerns about such a scenario have grown steadily since the 1998 nuclear tests by India and Pakistan. The 9/11 terrorist attacks served as a reminder of the threat such a scenario could pose to the U.S. homeland. Recent reports about North Korean leader Kim Jong-Il's poor health and growing concerns about radical Islamist elements operating within Pakistan reinforce these concerns.

Implications of such an event include the following:

- The collapse of a WMD-armed state could lead to the sudden proliferation of nuclear, chemical, or biological weapons capabilities to state or nonstate actors, which in turn could provoke regional instability, threaten friendly states and allies, and sharply limit U.S. freedom of action in a crisis.
- The transfer or leakage of WMD capabilities to hostile nonstate actors could result in a sudden and

catastrophic nuclear, chemical, and/or biological weapons use against the U.S. homeland as well as U.S. interests and allies overseas, forcing the United States to maintain an extended high alert status.

- Necessary responses to such a crisis could require large-scale deployments of U.S. military capabilities, forcing difficult decisions regarding the deployment of low-density, highly specialized counter-WMD assets as well as of general purposes forces already engaged in large-scale operations elsewhere.

- In the context of such a crisis, other regional and global powers may seek to gain advantage or, at a minimum, protect their own interests in a manner not consistent with U.S. interests. Washington decisionmakers will need to engage in complex global diplomacy while simultaneously responding to the operational needs of the crisis and reassuring allies.

- U.S. forces operating in or near the crisis area would face a substantial risk of deliberate or accidental use of nuclear, chemical, or biological weapons against them. U.S. forces would need to operate in a state of constant readiness for chemical, biological, or nuclear/radiological use, which could significantly degrade operational response times. Moreover, many forces and specialized capabilities could be

diverted to deal with consequence management requirements emanating from the crisis.

- Such a crisis could quickly "go global"—generating operational requirements across multiple areas of operation and calling for complex coordination of efforts among multiple combatant commanders.
- Coordinating such a complex contingency would be equally difficult on the civilian side, where the activities of the Departments of State, Defense, Homeland Security, and Energy would need to be managed and coordinated to ensure the effective allocation of resources and consistent communication.

Response Requirements

This scenario is dangerous not only because of the threat posed by rapid proliferation, but also because of the size and complexity of the crisis and speed with which events could spiral out of control. This complex global contingency would require a wide range of simultaneous activities and responses, carried out on a global basis under dangerous operating conditions and enormous time pressure. U.S. military and civilian leaders would need to manage multiple complex operations in which there are numerous factions and countries in pursuit of different and sometimes conflicting agendas with events unfolding in multiple areas of operation simultaneously. The

United States and its partners would have to search for WMD programs whose elements and locations are only suspected at best, and in environments where access would likely be obstructed by hostile actors, difficult terrain, and/or complex political calculations. The longer this process takes to unfold, the more likely it will be that elements of the failed state's WMD programs, including actual weapons or critical weapons materials, will "go missing"—correspondingly increasing the burden on detection and interdiction assets to find and secure those WMD program elements before adversaries can make use of them. The geographic expanse of the detection and interdiction challenge would become immense, from national to regional to global.

In addition to locating, characterizing, securing, and, where possible, disabling/destroying WMD capabilities before they fall into more dangerous hands, the U.S. military and its international partners could be called upon to:

- engage the international community in a coordinated response to the crisis
- prevent the transfer of nuclear, chemical, or biological weapons, materials, and/or expertise to state or nonstate actors
- detect and interdict the movement of WMD weapons, materials, or components before they reach their intended destination

- work closely with major international actors to prevent the transfer or leakage of WMD weapons or capabilities and coordinate with other major powers to prevent a possible spillover of violence
- work to prevent civil war or broader conflict by assisting sympathetic parties in the region with humanitarian assistance and political stabilization
- protect American and friendly forces, as well as civilians in the region, from the use of nuclear, chemical, or biological weapons and be prepared to respond to such use
- defeat WMD capabilities that pose an immediate risk to the forces and interests of the United States and/or partner nations
- enhance protection of the U.S. homeland to include a fully layered defense from the point of origin of the threat to the location of a possible attack
- prepare the homeland for attack should efforts to contain the WMD threat to the theater of operation fail.

An effective response to a large-scale WMD contingency, such as the collapse of a WMD-armed state, will depend on our ability to integrate and leverage military and nonmilitary capabilities while working in a coordinated fashion with key allies and international partners to contain

the threat as quickly as possible. Within DOD alone, the integration challenge would be great, and across the interagency the challenge would be even greater. Such a large-scale, complex effort has never been tested or exercised, and there are no current mechanisms or bureaucratic processes adequate to the task. In such a situation, where needs will far outstrip available capability, success will depend on the U.S. ability to allocate resources efficiently across a wide set of requirements in multiple areas of operation.

Where We Stand Today

The WMD response infrastructure is overwhelmingly focused on the terrorist threat. In recent years, the U.S. Government has undertaken numerous additional programs and activities designed to enhance national capabilities to prevent and respond to WMD terrorism, both unilaterally and in conjunction with international partners. While many of these efforts represent significant advances since 9/11, they have also contributed to a view of the threat as confined to isolated terrorist attacks rather than as a complex, large-scale global contingency. Nevertheless, these programs, activities, and capabilities constitute the infrastructure that would be available to respond to a large-scale or global WMD contingency.

DOD Response Capabilities

Special operations. Within the military, the most important changes have involved the role of U.S. Special

Operations Command in synchronizing DOD efforts in combating terrorism—including efforts to track, interdict, and if necessary defeat potential sources of WMD terrorism. Even so, these capabilities are largely oriented toward isolated, high-threat events. While critically important, the Nation's limited special operations capabilities cannot possibly meet the challenge posed by state-owned WMD threats generally, let alone the massive requirements generated by the collapse of a WMD-armed state.

Homeland defense. USNORTHCOM had a clear mission to support national efforts to defend against WMD attacks targeting the U.S. homeland and to support a national response to a WMD catastrophe should defenses fail. At the start of such a crisis, the command would energize national military defenses and prepare for the possibility that efforts to contain the crisis in the region could fail and the U.S. homeland could be threatened. It is not clear, however, how resources and capabilities would be allocated between USNORTHCOM and the other regional commands impacted. The domestic political pressure to keep specialized response assets at home during a crisis, even in the face of actual or imminent WMD use abroad, would be considerable. In such a scenario the Department of Defense may face conflicting pressures on whether to use key units (such as the Army's 20th Support Command, the

Marine Corps Chemical Biological Incident Response Force, and the CBRNE Consequence Management Response Force [CCMRF] units) primarily to protect the American homeland and allied populations or to interdict and eliminate overseas WMD threats. The multiple responsibilities of such units could add to confusion and bureaucratic battles during crises, so there should be a concerted effort to coordinate and deconflict units prior to a crisis.

The CBRNE Consequence Management Response Force units are the Department of Defense's newest counter-WMD response capability and are still in their formative stages. In October 2008, the United States stood up the first of three planned CCMRF units dedicated to respond to CBRNE incidents. These units, to be phased in over 3 years, will be assigned to USNORTHCOM as part of its homeland defense mission. Within the CCMRFs are medical, civil support, aviation, and logistical teams specializing in specific aspects of consequence management—giving them highly valued capabilities. While the development and designation of additional consequence management units are welcome, it should be noted that some of the units of the current CCMRF and those slated for future CCMRFs may well have additional, potentially conflicting duties in the event of a WMD-armed state collapse. For instance, the 20th Support Command, slated to become

part of a future CCMRF force, would also make up a significant portion of a Joint Task Force–Elimination in the event of a WMD-elimination operation. It seems unlikely that, at current force levels, the 20th Support Command can provide sufficient manpower and expertise to support large-scale response efforts in multiple theaters. Moreover, there are significant questions within the homeland security community about how CCMRF units could best be used in the event of a crisis.

WMD elimination. DOD's most specific contribution to the response required by a WMD-armed state collapse scenario has been the creation of a new mission requirement for WMD elimination, which is the official DOD term for "military operations to locate, characterize, secure, disable, and/or destroy a state or nonstate actor's WMD programs and related capabilities in hostile or uncertain environments." Following a long and complicated bureaucratic process, the WMD elimination mission has begun to take hold. In 2007, DOD agreed to the establishment of the Joint Elimination Coordination Element (JECE). During peacetime, the JECE operates under the command authority of U.S. Strategic Command (USSTRATCOM) via its supporting element, the U.S. Strategic Command Center for Combating WMD, and is collocated with the Army's 20th Support Command. The JECE will provide operational-level planning, maintain situational awareness, and coordinate joint training and exercises for WMD elimination

missions in support of combatant command requirements. Upon request of a supported combatant commander, the JECE would act to enable and/or augment another joint or service headquarters to become a Joint Task Force–Elimination Headquarters to command and control the forces conducting WMD elimination missions.

Despite very real progress over the last 5 years, the elimination mission is still in its infant stages, support among the services and commands is tenuous, and concepts and capabilities are still lacking. While a Joint Task Force–Elimination can form the backbone of the military's capability to locate, characterize, and secure WMD capabilities in less permissive settings, that task force must be accompanied by a larger ground force element capable of providing logistics and security necessary for the task force's mission. Moreover, while this niche capability will improve the ability of the United States to respond militarily to the collapse of a WMD-armed state, it is by no means sufficient to deal in a timely fashion with the large, widely distributed WMD programs and capabilities such a scenario anticipates. This capability is "one deep"—DOD can only field one JTF–Elimination comprised of only 8 individual teams. Neither is this capability a substitute for highly specialized, but also limited, capabilities resident in the intelligence and special operations communities that are geared to clandestine or hostile environments. (See appendix A for further discussion of WMD elimination.)

Interagency Response Capabilities

Of course, the Department of Defense cannot begin to respond to such a crisis alone. Today, many of the most important efforts to improve the U.S. ability to respond to WMD terrorism have developed outside of the Department of Defense. These initiatives include the Proliferation Security Initiative, the Global Initiative to Combat Nuclear Terrorism, the Container Security Initiative, and the Megaports Program. They encompass and sometimes provide a mechanism to marshal and coordinate a wide range of interagency and international capabilities, including in the areas of detection, interdiction, consequence management, and attribution. Through the creation and collocation of the Intelligence Community's National Counterterrorism Center and National Counterproliferation Center, significant progress has been made in developing integrated responses to WMD challenges.

Interdiction. A number of significant improvements have been made in the area of WMD interdiction. The Proliferation Security Initiative launched in May 2003 and now including more than 90 countries has created a common set of principles regarding the transfer of WMD capabilities; facilitated and expanded the sharing of information and best practices about interdiction efforts; and encouraged a shared purpose and intention to prevent dangerous proliferation. The U.S. Government

has established an interagency focal point for interdiction that allows intelligence analysts and operators to collaborate in identifying and tracking proliferation risks and engaging military assets around the globe in interdicting WMD-related materials in transit. Even so, this focal point for interdiction only holds one piece of the interdiction puzzle, since terrorism-related transactions and the possible movement of high threat weapons and capabilities fall under the purview of the counterterrorism working groups and U.S. Special Operations Command. Once again, the interagency decisionmaking process and interdiction monitoring system are designed to monitor and respond to a small number of high-interest targets. Even so, U.S. Government decisionmakers have trouble coordinating responses and issuing guidance within the decision window. In a failed state scenario, the number of air, land, and sea interdictions and potential transit scenarios could expand dramatically, calling for multiple hail-and-queries or boardings in multiple areas of operation that could easily saturate existing capabilities and overwhelm decision resolution processes. (See appendix B for further discussion of WMD interdiction.)

Nuclear detection. Through the creation of the Domestic Nuclear Detection Office (DNDO) at the Department of Homeland Security, the U.S. Government has sought to create a holistic approach to U.S. efforts to detect and prevent the movement, transfer, and use

of nuclear and radiological threats. While many of these efforts have focused on improving detection capabilities at U.S. borders and ports of entry, DNDO also partners with the Department of Energy in efforts to detect these threats at a greater distance from U.S. shores. These efforts join a host of other projects designed to detect and inhibit the movement of dangerous weapons and materials before they can threaten the United States and its interests. As a result, today, more than ever, much of the capability and expertise to deal with a large-scale WMD contingency, such as the failed state scenario described above, lies outside of the DOD apparatus. Unfortunately, processes and systems necessary to identify, allocate, and coordinate these capabilities as part of a regional or global WMD containment effort are nonexistent. Thus, in most cases regional commands are not aware of these capabilities in DHS or the Department of Energy and lack mechanisms to integrate them into their regional response plans. Interagency partners are concerned about how to bring their capabilities to bear in such a scenario. They are also uncertain as to where and how to plug into the Department of Defense.

International response capabilities. Similarly, the United States has both led and joined a number of bilateral and multilateral efforts designed to increase WMD defense measures, as well as consequence management capabilities. All of these developments constitute

real improvements in American and allied capacity and capability to deal with the multitude of threats that could emerge in the event of a WMD-armed state collapse. However, multilateral improvement in other areas is much more limited. For example, while a tiny number of states are known to be developing rudimentary WMD-elimination capabilities and units, this mission is still predominantly a "U.S.-only" game, as the United States is the only country that can field elimination capability.

While these new programs and initiatives represent a substantial improvement over pre-9/11 capabilities, they are largely designed and calibrated to deal with relatively small and isolated events. The political implosion of a WMD-armed state like North Korea or Pakistan could quickly overwhelm the quantity of specialized counter-WMD assets for response as well as the quality of existing mechanisms for coordinating the planning and execution of the operational response across the Defense Department, the broader U.S. interagency, and the international community.

Gaps and Shortfalls

Limited Capabilities and Capacities

U.S. specialized counter-WMD units and capabilities are too limited to respond effectively to large-scale

WMD contingencies. The small numbers of specialized counter-WMD units that exist today are relied upon to perform a variety of missions, from elimination to consequence management, but those missions would likely occur in the same or overlapping timeframes in a scenario like a failed WMD-armed state. There simply are not enough of these units to handle these missions concurrently and in multiple locations. It takes a great deal of time, resources, and specialized training to build new units, particularly given the relatively small cadre of WMD experts available in and out of government.

New or improved counter-WMD technical capabilities, particularly in the areas of detection, assessment, and prioritization tools, and agent-defeat counterforce, are also needed to extend the capability of counter-WMD units. Enhanced detection of nuclear/radiological, biological, and chemical agents or materials is especially important as it is the foundation for efforts to defend against a WMD attack and to respond effectively should defense fail. The United States has made strides in improving detection technologies and in deploying them more broadly, as exemplified by the BioWatch program and the efforts of the DNDO. However, standoff detection of fissile material, biological agents generally, and some chemical agents remains elusive. Achieving standoff detection against WMD threats should be a research and development priority.

Inadequate Coordination and Synchronization

U.S. Strategic Command's mission to "integrate and synchronize" DOD's combating WMD activities has not yet been adequately defined, much less effectively implemented. In 2005, the Secretary of Defense gave the command the mission to "integrate and synchronize" the department's combating WMD activities. While geographic combatant commands (GCCs) generally acknowledge a peacetime role for USSTRATCOM in the deliberate planning process, they do not acknowledge concomitant authority for the command in reconciling counter-WMD shortfalls within and across their operational plans. Neither do the GCCs accept a synchronizing role for the command during actual operations. While new Unified Command Plan language makes clear that USSTRATCOM has a role in providing military representation on WMD matters and advocating for counter-WMD capabilities, it also states plainly that it does not have authority to execute or direct operations in this arena. While expanding USSTRATCOM's role may not be the only or necessarily the best answer for providing better overall coordination of the DOD response to a large-scale, globalized WMD event, it seems unlikely that the current supported/supporting command structure lends itself to managing such a unique and unfamiliar crisis.

The U.S. ability to plan, coordinate, and execute an effective whole-of-government response to the col-

lapse of a WMD-armed state remains seriously deficient. In part, this problem derives from dysfunctional organizational structures, poorly defined roles and missions, and a lack of clearly articulated guidance and authority with regard to large-scale WMD-related missions across the interagency process as well as among the combatant commands, Joint Staff, and Office of the Secretary of Defense (OSD) within the Department of Defense. The uncertainty infusing USSTRATCOM's role has also made it difficult for other U.S. Government agencies to know where to "plug into" the Defense Department in coordinating the planning and conduct of their own operational responses to WMD contingencies. This lack of coherence has been replicated within the White House and interagency process, where different aspects of such a failed state crisis scenario would involve multiple policy coordination committees on both the Homeland Security Council (HSC) and the National Security Council (NSC).

The lack of coordination and synchronization mechanisms inhibits efforts to evaluate alternative courses of action and assess associated risks. A failed state crisis will demand multiple simultaneous operational responses in multiple theaters of operation. This response will probably require difficult and sometimes risky tradeoffs especially with regard to efforts to locate and secure WMD capabilities in a collapsing or failed state. Should

high-demand, low-density assets be forward deployed or held in continental U.S.-based reserve? What are the benefits of long-range or air-delivered kinetic strikes in defeating a WMD-related facility versus ground-based WMD elimination capabilities? Can the strike be executed with limited risk of accidental release and disproportionate collateral damage? Are the benefits of early neutralization of the target outweighed by losses in the intelligence value of the site? Early destruction will preclude vital intelligence regarding the actual contents of the target, evidence of tampering, theft, or transfer, and leads on other potential targets. In most cases, efforts to reliably locate, secure, and contain a country's WMD capabilities will require that U.S. forces be "up close and personal" rather than "at a distance." On the other hand, in such a circumstance the need to rapidly contain the WMD threat and restrict possible pathways for weapons transfer and transit may force the United States to form uncomfortable alliances or share valuable information with less than reliable partners. These tradeoffs too must be evaluated in the context of a broad and integrated approach to the conflict that will account for the many operational and political needs of the situation. Currently, no organizational entity has the authority and expertise to provide a comprehensive view of these risks and trade-offs or to develop the rigorous analysis necessary to guide decisionmakers.

Leadership and Organizational Issues

Countering WMD threats, especially those arising from states rather than terrorists, is not accorded sufficient priority or staff resources today from the Joint Staff, OSD, and combatant commands. The number of personnel within OSD Policy and the Joint Staff (J5) responsible for counter-WMD policy, strategy, and planning is seriously inadequate and dispersed across too many organizational elements. Reorganizations within both entities over the past year and a half substantially reduced the number of personnel devoted to combating WMD and diminished the mission's organizational profile. This has reinforced a view widely held across the interagency that DOD is relatively disinterested in the combating WMD mission, which has compromised the department's ability to contribute to, much less to lead, national efforts to prevent, protect against, and respond to WMD threats.

Robust OSD and Joint Staff counter-WMD staffs are essential to the development and translation of WMD policy guidance and commander's intent to the defense activities and military commands that execute that guidance and intent. OSD and Joint Staff counter-WMD personnel also are critical to maintaining centralized awareness of the activities and requirements of the many defense organizations and military commands engaged in counter-WMD activities and to ensuring that those activities are being effectively coordinated. Rebuilding these staff capabilities

is an essential step in developing responses to large-scale WMD contingencies as well as to providing day-to-day management of these daunting WMD challenges.

What Needs to Be Done

Establish a comprehensive inventory of all specialized counter-WMD forces and capabilities within DOD and the larger interagency. In particular, this assessment should include search, detection, and response capabilities from the Departments of Homeland Security, Energy, State, Agriculture, and Health and Human Services; the Environmental Protection Agency; and the Intelligence Community.

- Identify specific gaps and weaknesses of existing counter-WMD forces and capabilities using risk-based assessment against the demands of a large-scale WMD contingency. Include training and education within the assessment, as specialized WMD knowledge is a critical but scarce asset among forces today.
- Develop and implement a plan to remedy the gaps and weaknesses identified per the foregoing assessment in the U.S. capacity to respond effectively to large-scale WMD contingencies.

Expand specialized, counter-WMD units and capabilities. Some capability shortfalls are already well identified and documented. In particular, DOD must

seek to expand the capacity of its specialized counter-WMD forces/units for WMD detection, interdiction, and elimination, both within the special operations and general purpose forces. In addition, the U.S. Government must increase investments in WMD stand-off detection, medical countermeasures, and technical forensics capabilities.

Improve processes and procedures for coordinating operational responses to large-scale WMD contingencies, both across the Defense Department and the larger interagency community.

- Define the specific targets and goals for the effective synchronization of counter-WMD operations within and among the military and other concerned departments and agencies.
- Resolve issues with regard to U.S. Strategic Command's role in "integrating and synchronizing" the WMD mission space and identify processes by which DOD can plan and execute global counter-WMD operations.

Consolidate counter-WMD responsibilities within OSD and the Joint Staff, and establish a single, senior OSD point of contact for interagency cooperation on countering WMD. Restore counter-WMD personnel reductions that were made under the most recent OSD Policy and J5 staff reorganizations.

Exercise operational responses to large-scale contingencies on a regular basis, both across the Defense Department and the larger interagency community.

- Exercise, exercise, exercise.

BIOLOGICAL TERROR CAMPAIGN

The crisis scenario. *Analysis of samples from multiple BioWatch sensors has identified a large-scale release of aerosolized anthrax 12 hours earlier during the Fourth of July Celebration on the National Mall. The U.S. Government has high confidence that a biological attack has occurred but has limited information about the extent of the attack or the size of the area affected. Because of these uncertainties, initial estimates suggest that anywhere from 100,000 to 1 million people might have been exposed to the deadly spores, including those on the Mall during the release, those downwind of the release, and those in other areas where anthrax spores have been unwittingly carried by parties who were exposed initially. Because of uncertainty as to exactly who was exposed, public health experts indicate that it may be necessary to provide pre-symptomatic treatments to everyone in the Washington metropolitan area (up to 5 million people). The Nation has been at a heightened state of readiness for a bioterrorist attack since an anthrax attack in the London subway system 2 months earlier infected more than 2,000 people and resulted in more than 500 deaths. In recent weeks, intelligence sources have confirmed that a previously unreported disease outbreak in Kashmir that killed dozens of people was likely the work of an al Qaeda affiliate conducting a dry run of an anthrax*

attack. Due to limited disease surveillance capabilities, Indian medical, public health, and security officials failed to recognize the attack. It now seems likely that the United States and its European allies are facing a broader biological terror campaign, making additional attacks in the coming days and weeks likely.

Senior decisionmakers are consumed with the enormous tasks of saving lives and preventing follow-on attacks. Modeling suggests that 90 percent of those actually infected can be saved if they are located and treated within 48 hours. Activation of the Strategic National Stockpile is under way, and health departments in the National Capital Region have begun to identify and mass treat the potentially exposed population. That said, it is not clear how many of the infected can be located and treated within this critical window or how the area will cope with the tens of thousands likely to require intensive medical intervention. At the same time, law enforcement and intelligence agencies are trying to attribute the attacks and prevent follow-on attacks, but they have little to report. Word of the attack reached the press within minutes of the start of responses, and senior officials worry that panic will spread across the country.

Policy Implications

Biological attacks on U.S. urban areas would have unprecedented and potentially catastrophic consequences for the Nation. Today, the United States probably could

not stop a biological attack even after receiving strategic warning. At best, officials might be able to detect an attack within a day, but only if, as in the above scenario, an attack occurs in a place and manner that can trigger BioWatch sensors to provide an alert. Moreover, U.S. leaders would be forced to rely on response capabilities that are largely untested for crises of this magnitude. Complicating matters, many of those affected would be government officials responsible for response operations. Local and state governments, aided by the Federal Government, would need to distribute antibiotics to millions within days to minimize loss of life. Even with a highly effective response, senior officials know that tens of thousands of people would probably die. With a failed response, fatalities could easily exceed 100,000. Mounting an effective response to such a crisis would pose challenges that could make the difficulties of Hurricane Katrina seem small. It would not be a time for hesitation.

The impact of such an attack would extend far beyond those actually infected. Because of the recognition that "reload" is highly feasible with biological agents, the population will probably expect follow-on attacks. That will generate widespread fear, as was evident from the public reaction to the 2001 anthrax letters, and fear could degenerate into panic if government responses do not enhance confidence. People across the country would likely alter normal patterns of commerce and transportation. Some

may flee urban areas in the hope of being less vulnerable. Others may refuse to go to work or send their children to school, especially if the government's handling of the attack raises doubts about its ability to protect its citizens. If fear of repeated attacks takes hold in the population, it could disrupt the country's financial and economic systems and thus the fabric of our society.

Such circumstances will require decisionmakers to undertake operations of a scope and complexity with which they will have had no previous experience. They will be obliged to act with incomplete or inaccurate information. At the same time, the world will be looking to the United States to take the lead in organizing the global effort to prevent additional attacks. Drastic measures will be needed to regain public confidence since any subsequent attacks could destroy the legitimacy of our national institutions.

Other implications of such an event include the following:

- Responding to a bioterrorism attack will require an unprecedented national effort calling for integrated responses by both government (Federal, state, local, and tribal) and private institutions. Given our Federal form of government, this will pose an extraordinary challenge.
- Enormous pressures to locate the perpetrators and prevent additional attacks may result in unprecedented

intrusions of law enforcement in daily life and curbs on civil liberties.

- Other nations will try to ensure that they are not attacked and may drastically restrict the movement of people and goods.
- The economic cost to the United States could easily exceed $1 trillion, and cumulative international costs would be far higher. Such an attack could devastate economies already faltering in the global recession.
- A large swath of the Nation's capital could be rendered unusable/uninhabitable until people feel confident they are not at risk for infection from the re-aerosolization of spores blanketing the area.
- The catastrophic use of a biological weapon could result in broader adoption of biological agents as terrorist weapons and erode global norms against their use.

Response Requirements

The unique characteristics of biological weapons will profoundly impact responses. First, biological agents used intentionally to cause disease are the only weapons other than nuclear devices capable of causing catastrophic casualties. Second, once a group develops the capability to produce and disseminate biological agents, it will be

relatively easy to generate multiple attacks, what Richard Danzig has called "reload." Third, it is extremely difficult to detect a biological attack. In the absence of effective environmental sensors, the first instance of a bioterrorism attack is likely to be the onset of illness. A small-scale attack might never be detected, and even a larger attack could be misidentified as a natural outbreak. Finally, effective medical countermeasures can prevent serious illness, and, in some instances (that is, smallpox and antibiotic susceptible bacterial agents), it may be possible to prevent the onset of disease altogether. But all this often means identifying and treating exposed individuals within days of exposure, placing a premium on both rapid detection of the attack and mass prophylaxis of those who are potentially exposed.

These considerations dramatically impact the nature of the responses to biological weapons use. Faced with a bioterrorism campaign, the U.S. Government must act to:

- detect biological attacks as quickly as possible
- initiate preventive treatments for those exposed as well as for first responders and other high-threat areas, but only if the biological agent is an organism for which treatments exist
- treat actually infected individuals to save lives
- maintain order and reassure the public

- prevent follow-on attacks
- attribute the attacks—that is, identify who is responsible
- act against those responsible
- initiate recovery processes, especially to deal with the impact of widespread contamination that would result from a large anthrax release
- work with international partners in all aspects of the response.

Government officials' initial concern will be discovering that an attack has taken place. This will involve both environmental sensors, such as the BioWatch system deployed in major urban areas, and public health disease surveillance systems.

Recovery will be seriously complicated if the perpetrators employ a biological agent, such as anthrax, that can contaminate the target area for an extended period. Many biological agents do not survive long outside of a host, but anthrax spores can remain viable for years. It may be necessary to order evacuations of anthrax-affected areas.

Where We Stand Today

Some terrorist groups probably possess extremely rudimentary biological weapons, and some are seeking to acquire the more sophisticated capabilities needed to inflict mass casualties. Currently, the primary focus is on

al Qaeda, which had a program to develop anthrax for use as a biological weapon prior to 9/11. That activity was disrupted by the U.S. invasion of Afghanistan. Published information makes it difficult to assess whether al Qaeda has resumed those activities. According to 2008 testimony by the Director of National Intelligence, the Intelligence Community believes that al Qaeda and other groups will rely mainly on explosive devices, but they continue to seek biological weapons.

Detection of Biological Attacks

In the absence of environmental sensors, the first indication of a bioterrorism attack will be illness. A small-scale attack might escape detection altogether, and even a larger attack—depending on what agent is employed—could be misidentified as a natural outbreak. Under ideal circumstances, an astute clinician will detect the disease symptoms and provide warning to the public health community. In a small-scale attack, as in the case of the 2001 anthrax letters, detection depends largely on the chances that those infected seek medical care and are seen by someone who can identify the unusual disease. In a larger event, the mere fact that large numbers are seeking medical care will provide warning that something unusual is happening, and—given that certain parts of the population are likely to be more susceptible than the rest—this could provide timely warning to protect the bulk of the

populace. Public health disease surveillance systems are operated primarily by state and local health departments, although certain Federal agencies (especially the Defense and Veterans Affairs Departments) have them as well.

Environmental detection capabilities were enhanced significantly after 9/11 through the development and fielding of new sensor networks. The Department of Homeland Security, along with the Environmental Protection Agency (EPA) and state and local partners, manages the BioWatch system. It has sensors in more than 30 urban areas. Because the system relies on filters that must be transported to a laboratory, it takes between 10 and 34 hours to analyze the samples. The BioWatch system is supplemented by detectors operated by the Defense Department, the Postal Service, and other agencies. In addition, certain Federal agencies operate detectors deployed for special events.

Medical Response to Attack

Prophylaxis. Rapid prophylaxis (medical treatment before the onset of illness) can prevent or reduce the severity of illness from some biological agents. For many agents (antibiotic-susceptible bacteria and smallpox), rapid treatment of exposed individuals can prevent the onset of disease or at least reduce the severity of the symptoms. Generally, this means treating individuals within days of exposure, placing a premium on both rapid detection of

the attack and the speed of prophylaxis. Inasmuch as it may be unclear who has been exposed, this may require providing treatments to significantly more people than the number likely to become ill.

To ensure that people receive treatment, the United States relies primarily on the speedy establishment of treatment facilities (point of distribution sites, or PODs). Considerable work has been done to enable local governments to establish PODs. In addition, the U.S. Government has developed a supplemental delivery system for antibiotics using the U.S. Postal Service. Studies and exercises have demonstrated that the postal system can deliver initial antibiotic doses to most addresses in a major urban area before the PODs can be fully operational. As a result, the two systems are viewed as complementary.

Strategic National Stockpile. The Strategic National Stockpile (SNS) is central to medical mitigation capabilities. The SNS is a centrally managed repository of medical supplies intended to address the consequences of catastrophic incidents. It currently stocks large quantities of certain vaccines (sufficient smallpox vaccine for the entire population and several million doses of anthrax vaccine), antibiotics (sufficient to treat tens of millions, assuming the bacterial agent is not resistant to antibiotics), and other medical countermeasures for radiological and chemical exposures.

Medical countermeasures development. Considerable effort is focused on enhancing medical countermeasures

capabilities. To address countermeasures deficiencies, Congress enacted Project BioShield in 2004, which addressed a number of issues, including providing authority for the issuance of Emergency Use Authorizations to allow off-label use of medical countermeasures when they are deemed effective in preventing and treating disease. More significantly, it gave the Department of Health and Human Services (HHS) funding and enhanced acquisition authorities for procurement of new medical countermeasures. Experience with BioShield, however, demonstrated that the market for biodefense medical countermeasures was insufficient to entice most large pharmaceutical companies to develop biodefense products, and that smaller companies responsive to HHS solicitations often lacked the expertise to complete development of new products. As a result, Congress enhanced the authorities assigned to HHS and created the Biomedical Advanced Research and Development Authority (BARDA). However, BARDA did not receive the autonomy, authorities, and funding needed to accomplish its mission. Some of these deficiencies were addressed by providing supplemental funding to BARDA, but it still lacks the necessary authorities.

Security. Medical responses depend heavily on the ability to provide security. Postal workers delivering antibiotics, PODs, and infrastructure associated with the response to a biological attack will need protection because

of concerns that people desperate for medicine might endanger the safety of responders. Responders—whether postal employees or health care professionals—may be reluctant to perform critical tasks in the absence of effective security. This will almost certainly stretch the capabilities of local law enforcement agencies. As a result, it may be necessary to rely on National Guard troops and other assets to augment regular law enforcement capabilities.

International Issues

Virtually any use of biological terrorism will involve many countries, even if the attack is limited to a single country. Contamination can easily spread across borders, and travelers infected in one country might be on the other side of the globe before it is known that they were affected. U.S. Government officials will need to initiate contacts with other countries at the first indication of a bioterrorism attack anywhere in the world. U.S. citizens might be the victims of an attack in another country. Even if that were not the case, U.S. Government officials will need to work with foreign law enforcement, intelligence, public health, and emergency response personnel to offer assistance and to understand the emerging threat. Perpetrators may reside somewhere other than the United States; working with foreign countries may be essential to law enforcement or other responses aimed at those responsible. The initial international implications will be much greater if a biologi-

cal attack involved a highly communicable disease, such as smallpox or foot and mouth disease, as other countries act to prevent its spread to their territory. Such actions could include exclusions and quarantines that might dramatically affect the international flow of people, goods, and services; even military operations might be disrupted.

There is considerable activity within the international community to address BW-related issues. The United States and the international community have developed numerous instruments to address the biological warfare threat. There is a treaty framework, consisting of the 1927 Geneva Protocol and the 1972 Biological and Toxin Weapons Convention, prohibiting possession and use of biological weapons. The United States also has coordinated its own export controls with other like-minded states through the Australia Group (there are currently 41 participating countries). After 9/11, U.S. international BW engagement activity expanded considerably but shifted focus from state to nonstate terrorist threats. One of the most important results of these activities was United Nations Security Council Resolution 1540 requiring states to ensure that terrorists are unable to acquire the materials needed to produce WMD, including biological weapons. Through the auspices of the UN's 1540 Committee, the international community works with individual countries to develop the legal and law enforcement infrastructure to undertake these obligations.

Interagency Issues

U.S. biodefense activities are widely dispersed within the Federal Government, and many key roles are assumed by state, local, and tribal governments or by the private sector. In part this reflects the nature of the problem, which requires a national response that cannot be fit neatly into a single basket. Major biodefense roles are assigned to the Departments of Agriculture, Defense, Homeland Security, Health and Human Services, Justice, and State, to the Environmental Protection Agency, and to various elements of the Intelligence Community:

- Agriculture is responsible for protection of the farm sector from biological attack, as well as for food security associated with meat, poultry, and eggs.
- Defense is primarily responsible for activities related to protection of military forces and the conduct of military operations overseas, but also has a homeland defense role involving support for domestic authorities. This includes involvement with development, acquisition, and deployment of biodetectors and medical countermeasures. DOD also conducts a large biological Cooperative Threat Reduction Program abroad, primarily in the states of the former Soviet Union.

- Health and Human Services is primarily responsible for medical and public health responses, including research, development, and acquisition of medical countermeasures for the civilian sector, medical and public health preparedness, and execution of medical response activities under the National Response Framework. It operates the National Disaster Medical System, maintains the SNS, and is responsible for execution of the BioShield program for acquisition of medical countermeasures. HHS is also responsible for the protection of most food products.
- DHS develops and operates biodetectors, is responsible for the planning and overall coordination of the national response to catastrophic terrorism incidents, and conducts the risk and threat assessments meant to guide HHS's medical countermeasures development and acquisition. It has a lead role for bioforensics and is currently responsible for operating the Nation's primary laboratory for exotic foreign animal diseases.
- Justice has the lead for prosecution of bioterrorism cases, and through its oversight of the Federal Bureau of Investigation has the lead role in investigating biological attacks. It plays a major role in a range of preparedness and awareness activities, especially those directed at the law enforcement community.

- State has the lead role in international engagement and is responsible for negotiations involving the Biological Weapons Convention and other activities such as implementation of UN Security Council Resolution 1540, which mandates that countries take steps to prevent illicit acquisition of WMD.
- The EPA has the lead for decontamination, although not for broader restoration operations.
- Little attention has been given to post-attack restoration operations, but it appears Homeland Security would have the lead given its overall coordination responsibilities.

Biodefense responsibilities often are divided within agencies and departments. Unfortunately, coordination among agencies is often hampered by problematic internal coordination. HHS, for example, assigns biodefense responsibilities to three main agencies: the Centers for Disease Control and Prevention, the Food and Drug Administration, and the National Institutes of Health. In addition, the HHS Office of the Secretary, through the Office of the Assistant Secretary for Preparedness and Response, is tasked with advanced medical countermeasures development and certain acquisitions, and for emergency preparedness planning. Similarly, other departments with significant duties, including the Defense and State Departments, divide their biological activities among multiple, dispersed offices.

White House biodefense efforts are divided internally. The primary White House center of activity on biodefense issues has been within the Homeland Security Council, which has had a Senior Director for Biodefense matters since its inception. This office has played a critical oversight role for the development of biodefense policy and strategy and has been the lead office for pandemic influenza planning. The National Security Council also has important roles in the biodefense arena but has given significantly less attention to it during the past 5 years. Issues involving international engagement on biodefense matters have been assigned to the Counterproliferation Strategy Office and the Counterterrorism Office has also had an important role. As the new administration develops its own structure for the Executive Office of the President, it is important not to lose the benefits of an office focused exclusively on biodefense issues within the NSC/HSC architecture. It is crucial that these critical biosecurity issues not get lost within a centralized approach that will likely be dominated by nuclear security issues.

What Needs to Be Done

Review biodefense authorities and strategies. The national biodefense program evolved over the past decade, starting in the Clinton administration. Many authorities and national requirements reside only in Homeland Security Council documents, including *Biodefense in the 21st*

Century, the Bush administration's biodefense strategy. In addition to defining its own strategy for addressing the challenges of biological warfare, bioterrorism, and natural disease outbreaks, the new administration needs to be aware that programs it supports may disappear if earlier White House guidance is not reiterated.

- Develop a strategic framework providing guidance to both the national and homeland security communities.
- Conduct a comprehensive review of U.S. biodefense activities in the context of other pandemic disease concerns.

Improve collection and analysis of biological warfare and bioterrorism intelligence. According to the 2005 report of the WMD Commission, the quality of intelligence related to biological warfare is poor. It blames many of the deficiencies on inadequacies in the Intelligence Community's collection and analysis of BW-related intelligence.

- Enhance the quality of intelligence analysis related to biological warfare activities, whether state or terrorist.
- Enhance collection of intelligence for biological warfare–related targets.

Strengthen national capabilities for mitigating the consequences of a biological attack. There are significant deficiencies in national capabilities to apply medical prophylaxis to large numbers of people.

- Develop a family of agent-specific response plans that provide a comprehensive response framework comparable to the existing pandemic influenza response strategy and response plan.
- Revisit the Homeland Security scenarios to generate more realistic challenges to guide planning and exercising of biodefense response capabilities.

Develop capabilities to disrupt follow-on biological attacks, or "reload." Because of the nature of biological weapons, an adversary will probably possess the ability to mount multiple attacks. Disruption of follow-on attacks is essential. Law enforcement agencies need to develop exercised capabilities to address the prospects for follow-on biological attacks.

Strengthen medical countermeasures development and acquisition capabilities. The Nation's stockpile of medical countermeasures has severe limitations, including gaps in our ability to treat most viral agents.

- Enhance the Biomedical Advance Research and Development Authority by making it a separate agency, funded fully and with enhanced authorities to accomplish its mission.
- Better integrate basic science, development, and acquisition processes in DOD and HHS for medical countermeasures, both within and between departments.

- Give greater priority to development of medical countermeasures designed to address agents for which there are no known countermeasures, as well as countermeasures that might protect against future threats.

Improve bio-attribution capabilities. The United States has only a limited ability to attribute biological agents to their origin. This limitation rests in large part on the nature of the pathogens themselves and on the scientific limitations of bioforensics.

- Develop and exercise a bio-attribution process.
- Devote more resources to bioforensics, especially the scientific foundations for authoritative forensic assessments.

Strengthen efforts to deter use and dissuade acquisition of biological weapons. Deterrence is a central pillar of the existing combating WMD terrorism strategy. In 2008, the United States articulated a declaratory policy intended to deter support to those who would perpetrate WMD terrorism. Dissuasion became a key element in the strategic lexicon when DOD gave it a central role in U.S. nuclear strategy in 2001. The concept recognized the importance of influencing adversaries long before they had entrenched weapons programs and possessed WMD capabilities they might be tempted to employ.

- Reinforce deterrence of state use of biological weapons.
- Emphasize activities that dissuade acquisition of biological weapons by state and nonstate actors.

Strengthen international engagement in the biological arena. Many efforts to counter bioterrorism overlap with international efforts directed at natural disease outbreaks. At the same time, not all countries view the bioterrorism threat as seriously as does the United States. As a result, future international engagement will require a broad framework that takes into account the challenges of natural outbreaks, such as pandemic influenza or Severe Acute Respiratory Syndrome, as well as intentional spread of disease.

- Develop a strategy for international engagement that integrates a full range of activities to address the challenges of natural outbreaks as well as of state and nonstate misuse of biological agents.
- Launch a comprehensive public health and biodefense initiative similar to the Global Initiative to Combat Nuclear Terrorism. Promote negotiation of a biological terrorism convention comparable to the nuclear terrorism convention.
- Build on existing engagement activities through the BTWC, United Nations mechanisms (particularly the UN Security Council Resolution 1540

process), and biological engagement initiatives (especially at the State Department for projects executed through HHS, Agriculture, and other agencies with specific expertise).

Strengthen interagency processes for managing biodefense activities. Biodefense activities are widely dispersed within the Federal Government and among state and local governments. Coordination among and within agencies is poor. White House coordination on biodefense matters has been complex and cumbersome.

- Review White House processes for managing diverse biodefense activities to ensure effective interagency coordination and Presidential oversight within the overall architecture for management of national security, homeland security, and counterterrorism activities.
- Require each department and independent agency to designate a lead office for interagency coordination on biological defense activities.

NUCLEAR DETONATION IN A U.S. CITY

The crisis scenario. *Witnesses have reported a blinding flash and mushroom cloud in the seaport area of a major U.S. city. First responders have detected high radiation levels in the area. Aerial reconnaissance has indicated that most structures within a 1-square-mile area have been destroyed or severely damaged. The Federal Government has assumed that the explosion was a nuclear detonation, with a yield of perhaps 1 to 10 kilotons, but experts have given no definitive word on the nature or size of the event. If it was a nuclear detonation, modeling predicts that nearly 16,000 people have died or soon will from the detonation's prompt effects and that another 20,000 are at risk of death from exposure to radioactive fallout downwind of ground zero. An additional 10,000 people could be injured. Local first responders are carrying out rescue efforts but are hampered by the physical devastation, radiation hazards, and their unfamiliarity with such an event. Federal emergency response assets are en route to the scene.*

The Government has not characterized the event publicly as a nuclear detonation, but the media are reporting it as one. Speculation is rife as to the most likely culprits and how Washington will respond. No one has claimed responsibility, nor has the Government determined who

is responsible. Nevertheless, some public opinion leaders are calling for prompt military action against potential perpetrators. The biggest question on leaders' minds is whether to expect follow-on attacks. Fear grips the United States and other Western nations. People are fleeing major cities, including Washington, New York, London, Paris, and Tel Aviv.

World leaders, including those of all known and suspected nuclear weapons states, are condemning the apparent attack and pledging support and assistance to the United States. They entreat Washington to refrain from rash military action and to work through international bodies, including the United Nations Security Council and the International Atomic Energy Agency, in determining and holding accountable the responsible parties. The U.S. President's first public remarks on the event are awaited anxiously everywhere.

Policy Implications

It has been said that a nuclear detonation in a U.S. city would "change everything." It is difficult to imagine a more shocking blow to the public's sense of security and its faith in traditional methods of securing the Nation. Americans know that some current and potential adversaries already possess nuclear weapons, but faith is placed in those states being sufficiently rational to be deterred by our overwhelming retaliatory capability. Americans also

know there are terrorists who seek nuclear weapons and have justified their use against our nation, but some comfort is taken in the assessment that terrorists do not currently possess such weapons and that it would be very difficult to acquire them. The Government's efforts against nuclear terrorism are focused on prevention: securing nuclear weapons and fissile material and detecting and interdicting them if they slip their bonds. Yet if an act of nuclear terrorism occurs, that source of comfort would immediately disappear. Americans would be consumed with fear about the possibility of future attacks and could:

- demand violent retaliation against the most likely suspects even before we have convincing evidence of their involvement in the attacks, potentially stimulating a widening and escalating cycle of catastrophic violence
- consider unprecedented restrictions on personal freedom to enhance our security
- relocate away from population centers that are likely sites of future attacks
- call for withdrawal from international commitments and reducing other international engagement in an attempt to build a more impregnable barrier around our country and/or to give adversaries less cause to attack us.

Response Requirements

Our government, economy, and society could all change dramatically and adversely in response to a nuclear detonation in one of our cities and the prospect of more to come. Preventing a detonation is imperative, but so is preparing to manage its consequences. Confronted with a nuclear detonation in a major urban area, an administration must act to:

- save lives and rapidly restore impacted critical infrastructure and functions
- prevent and defend against potential near-term, follow-on attacks
- maintain domestic order and reassure a frightened public
- protect important interests at home and abroad from opportunistic adversaries
- attribute the attack, that is, determine its source
- act against those deemed responsible for the attack
- undertake other, longer term responses to prevent future attacks
- effect longer term recovery and restoration of impacted area and infrastructure
- balance increased security against individual freedom at home; balance less exposure to future attacks

against the engagement necessary for long-term prosperity and security abroad

- work closely with allies and partners to accomplish the foregoing.

Saving lives, rapidly restoring critical infrastructure and functions, and preventing and preparing to defend against follow-on attacks will take priority. But the objectives of maintaining domestic order and protecting other important interests from opportunistic-minded adversaries follow close behind. Public statements and diplomatic communications that convey awareness, knowledge, resolve, and a clear way forward will play a key role in achieving these objectives. Attributing responsibility for the attack could take weeks or months, if it is indeed possible, but efforts must be initiated immediately to collect critical, time-sensitive data. Some of the attribution-relevant information gathered may contribute to determining whether follow-on attacks are coming.

Deciding the appropriate action to take against the perpetrators of the attack will depend heavily on who is responsible and our confidence in the determination. Attribution efforts may not support military retaliation if it is not possible to determine responsibility with sufficient confidence or if attribution leads to actors against whom military retaliation is infeasible or inadvisable. There are a range of nonmilitary responses that the administration

will also likely want to pursue, including those directed against actors who may be suspected of involvement and other measures intended to make it more difficult for future actors to carry out like attacks.

After completing lifesaving and stabilization efforts and restoring critical infrastructure, the focus must turn to long-term recovery and restoration. The most difficult long-term challenge could be striking the right balance at home between more effective security measures and protection of individual freedoms, and abroad between reducing our exposure to future attacks and maintaining the international leadership necessary to our long-term security and economic well-being.

The United States must work closely with its allies and partners in accomplishing all of the above tasks. Allies and partners can render significant assistance in managing the direct consequences of an attack. Information, materials, and capabilities they possess will be important in identifying and defeating any near-term follow-on attacks, attributing responsibility for the attack, and acting against those responsible. Such cooperation will clearly be needed to reestablish global conditions for long-term security and prosperity. Similarly, allies and partners will depend on the United States to support their responses to nuclear threats or attacks against them.

Where We Stand Today

U.S. efforts to address the threat of nuclear terrorism are heavily weighted toward prevention. Belated attention has been given to preparing to respond to an actual act of nuclear terrorism.

Managing the Consequences of Nuclear Attack

The United States currently lacks a robust nuclear consequence management capability, although important efforts are under way to enhance preparedness. A robust consequence management capability could save lives, facilitate restoration of critical functions, better contain social and political impacts, and more effectively manage the larger international security repercussions. *Nuclear consequence management is feasible*. It is important to keep in mind that a nuclear detonation in a major urban area would be horrific but not apocalyptic. We do not face the existential threat of large-scale strategic nuclear war that was the constant backdrop of the mid and late Cold War. That scale of destruction transcended consequence management. As a result, the United States allowed its robust civil defense program of the early Cold War to atrophy. Now that that level of destruction has dramatically receded at the same time the likelihood of such employment may actually have increased, the United States needs to reclaim the spirit and knowledge of an earlier period of robust civil defense.

The policy requirement for increasing our preparedness to manage the consequences of nuclear terrorism has been clear since shortly after the 9/11 terrorist attacks. A 10-kiloton detonation has long top-listed the Federal Government's homeland security planning scenarios. Yet it was not until early 2008 that the Department of Homeland Security stood up a Response Preparedness Team for a nuclear detonation, providing an organizational impetus for a sustained interagency effort to enhance nuclear consequence management readiness. It was not until August 2008 that DHS issued the final *Planning Guidance for Protection and Recovery from Radiological Dispersal Device (RDD) and Improvised Nuclear Device (IND) Incidents*. That document helps responders assess their radiation risks as they make safety decisions during emergency operations and provides a decisionmaking framework for reaching a consensus on the desired level of cleanup in affected areas, but it is geared much more toward RDD hazards than a nuclear detonation. And it was not until January 2009 that the Homeland Security Council released the first edition of planning guidance for response to a nuclear detonation. The recent developments outlined above constitute welcome if belated progress, but much more must be accomplished before the United States can be said to have a robust capability to manage the consequences of one or more nuclear detonations. Responders at all levels will need to digest

recent and forthcoming guidance, adapt it to their areas of purview, ensure that they have or can obtain the requisite training (especially with regard to radiation hazards) and equipment (particularly radiation detectors, dosimeters, and personal protective equipment), and regularly exercise their nuclear detonation response capability. The mechanisms to coordinate response assets effectively at various levels—local, state, tribal, and Federal—also must be clearly delineated and regularly exercised. More work needs to be done on modeling and developing appropriate responses to the mass psychological effects of a nuclear detonation (these are not addressed in current or forthcoming response guidance). Educating the general public in advance about nuclear effects and about how individuals should respond would facilitate response efforts and save many more lives. Important technical, legal, and regulatory issues of long-term recovery and restoration initiatives (particularly with regard to large-scale decontamination of structures and surfaces, roles and missions, and who pays) need to be addressed.

Attributing Nuclear Attacks

Determining the "who and how" of the attack will be an urgent priority. An immediate concern in the wake of a nuclear detonation will be attempting to determine whether additional attacks may be in progress and how to prevent them. Decisionmakers will need as much information as possible

about the attack to help prevent follow-on strikes. Even if no near-term, follow-on assaults are coming, the Government must still identify and act against those responsible for the attack to preclude their ability to undertake future attacks, deter other actors from attempting attacks, and satisfy the Nation's need to see justice done. Attribution capabilities and procedures are central to the Government's ability to accomplish these tasks.

Attribution is determination of the source and nature of an attack. It will be based on information primarily from intelligence sources, technical forensics (in this case, technical nuclear forensics), and broader law enforcement investigation. Attribution is often equated with technical nuclear forensics, and technical nuclear forensics is commonly believed capable of providing quick, "DNA-like" matches to known sources of nuclear material leading to the identification of the attack perpetrators. The reality is rather different. Technical forensics can provide some definitive information about the nature of the attack, but can take longer than senior policy officials may appreciate. Technical forensics may narrow the list of potential sources of the material used in a nuclear device, but it is unlikely to provide a specific match. Nor can technical nuclear forensics alone identify those who perpetrated the attack or those who may have assisted them, though it may provide important clues for the intelligence and law enforcement communities on where to focus their investigations. Any

determination of the source of the attack, how it was executed, and who is responsible, to the extent that these questions can be answered with high confidence, will depend greatly on intelligence and the results of a traditional law enforcement investigation.

Important strides have been made in recent years to strengthen nuclear attribution capabilities, including: 1) according attribution a much higher policy profile and priority; 2) reconstituting technical nuclear forensics capabilities that have been neglected since the end of the Cold War; and 3) establishing processes for integrating technical forensics, intelligence, and law enforcement information to produce better attribution assessments. The United States has also begun to reach out to allies and partners regarding cooperation on attribution, sometimes under the auspices of the Global Initiative to Combat Nuclear Terrorism. This is important because the United States most likely will require information and technical capabilities from other countries to attribute an attack. Moreover, other countries' participation in the attribution effort would enhance the international credibility and acceptance of U.S. findings and thereby garner greater support for Washington's responses and those it will ask other nations to make.

Many challenges remain, especially with regard to technical forensics, even though the Nation is better prepared to attribute nuclear attacks now than it was just

a few years ago. These challenges include reinvigorating an aging technical forensics infrastructure and workforce; reducing the time it takes to conduct technical forensics, both through near-term measures to shorten timelines for obtaining and transporting samples from the attack site to laboratories for forensics analysis, and through efforts to develop more responsive approaches for conducting analysis; removing statutory and other obstacles to sharing sensitive nuclear information with international partners when that is essential to attributing actual or attempted nuclear attacks; streamlining the integration of technical forensics, intelligence, and law enforcement information to better serve the needs of senior policy officials; and developing relevant declaratory policy.

Preventing and Responding to Nuclear Aggression

Response is, above all, about preventing future attacks. How the United States acts against those deemed responsible for a nuclear attack will be situation-specific and depend, in part, on our confidence in the attribution assessments, the identity of those deemed responsible, the domestic political context, and the broader international security environment. There will be a strong domestic desire to retaliate for the sake of punishment. The larger goal, however, must be to prevent future attacks, both by destroying, disabling, or otherwise removing the actors and capabilities that made

the attack possible and by deterring others from attempting attacks through demonstrating our willingness and ability to identify and hold accountable those responsible.

Response is thus very much about deterrence. Of course, the goal is to deter catastrophic attacks from occurring in the first place. Deterrence may be achieved by denial or by threat of retaliation, and both approaches figure in current U.S. strategy. If the Nation is perceived as well prepared to prevent, defeat, and mitigate the consequences of aggression, the prospect of failure may deter an adversary from attempting or facilitating a WMD attack. This is deterrence by denial, and its success depends on the quality of our intelligence, detection, interdiction, defense, and consequence management capabilities. Deterrence may also be achieved by a credible threat to impose unacceptable costs on an adversary in response to its WMD attack or facilitation thereof. This is deterrence by the threat of retaliation, and its success depends on the quality of our attribution and offensive capabilities and on the content and credibility of our declaratory policy. Put another way, deterrence by the threat of retaliation is a function of what we say we will do in response to the actions we seek to deter, how others perceive our capability to do what we say, and how others perceive our will to do what we say.

Deterrence will require a U.S. nuclear force that is reliable over the long term. Nuclear weapons experts cannot affirm the long-term reliability of our existing nuclear

weapons in the absence of testing. The Bush administration proposed the Reliable Replacement Warhead (RRW) program to address this problem. The RRW program would incorporate new materials and components into existing and previously tested nuclear weapons designs to make U.S. nuclear weapons safer, more secure, and more reliable without testing or enhancing military capabilities. RRW would replace existing operationally deployed warheads, permitting a significant reduction in the U.S. nuclear weapons inventory in two ways. First, the RRW's greater reliability would allow the United States to reduce the number of reserve warheads needed to hedge against failures among operationally deployed weapons. Second, the RRW would restore U.S. ability to manufacture additional weapons (rather than maintain a large reserve stockpile) if threat conditions required an increase in operationally deployed weapons. A warm production base is more secure than a large stockpile and better supports the new administration's goal of deep, stabilizing reductions in nuclear weapons. The administration will need to decide whether to adopt the RRW or a similar program to replace existing U.S. nuclear weapons to devise a different approach to ensure the reliability of the U.S. nuclear force over the long term.

Deterrence also requires a strong and credible declaratory policy. "Overwhelming response" and "fully accountable" are the two key elements of current U.S. declaratory

policy intended to deter nuclear or other WMD attacks or facilitation thereof by the threat of retaliation. The United States reserves the right to inflict an overwhelming response, including resort to our own nuclear weapons, on those responsible for attacks on our nation, forces, and allies. It also asserts that it will hold those who perpetrate and enable such nuclear or other forms of WMD attack fully accountable. Both concepts embrace ambiguity: they seek to persuade adversaries that they will suffer serious consequences, while not committing the United States to any specific type of response.

Current U.S. declaratory policy begs a number of questions. One is whether the policy is too ambiguous to influence an adversary's decisionmaking, particularly in light of North Korea having flouted various strong but ambiguous U.S. warnings regarding the progression of its nuclear weapons and missile programs without suffering undue consequence. If ambiguous statements like "fully accountable" are not considered compelling, a second question would be whether threats of greater specificity would be more desirable. A third question is whether the deterrent value of U.S. declaratory policy toward WMD threats would be increased if Washington reduced the scope of what it is trying to deter. For example, some argue that the United States should declare that the only purpose of its own nuclear weapons is to deter others' nuclear weapons use and that it no longer reserves the right

to resort to nuclear weapons in response to nonnuclear aggression. The new administration must carefully think through how the Nation could and would respond to an actual nuclear or other WMD attack, or the facilitation of such attacks, before it moves to alter longstanding U.S. declaratory policy toward WMD threats. Since there has been no known state employment of WMD against the United States since 1918, nor any major employment against our nation by nonstate actors, caution should be the guiding principle in any reexamination of current declaratory policy.

Securing Nuclear Weapons and Materials

Securing nuclear weapons and materials will increasingly need to occur outside of Russia. Extensive attention and resources have been devoted to securing nuclear weapons and materials, especially in Russia and other states of the former Soviet Union, so these assets do not come into the possession of actors who would perpetrate or facilitate nuclear terrorism. Cooperative threat reduction activities of the Departments of Defense, Energy, and State have funded the destruction or dismantlement of large numbers of Soviet nuclear weapons and strategic delivery vehicles. They are also enhancing security at Russian nuclear weapons sites, helping keep former Soviet nuclear weapons scientists employed in legitimate pursuits, supporting the conversion of fissile material from dismantled warheads

into civilian nuclear reactor fuel, converting nuclear reactors in third countries from using highly enriched uranium (HEU) to low-enriched uranium, and returning stocks of HEU to their country of origin (Russia or the United States). Much of this has been accomplished with the support of other allies and partners, such as the Global Partnership for Preventing the Spread of Weapons and Materials of Mass Destruction and the Global Threat Reduction Initiative. While securing existing nuclear weapons and materials clearly has not suffered from neglect, the global task is large and will increasingly need to focus on countries beyond Russia, particularly as the major tasks that Russian authorities have permitted on their territory are nearing completion.

Some countries, including U.S. allies, are resisting U.S.-championed nuclear fuel cycle initiatives. The United States and, in somewhat different form, the Director of the IAEA, have sought support for measures intended to end the proliferation of uranium enrichment and plutonium reprocessing (ENR) capabilities. ENR assets enable the production of fissile material suitable for weapons as well as of fuel for civilian nuclear reactors. Under the NPT, states may establish ENR capabilities and obtain assistance from other states, provided such capabilities are used only for civilian purposes and subject to IAEA safeguards. Some states, like North Korea and probably Iran, have covertly abused this allowance for

nuclear weapons purposes. To garner support for ending the proliferation of ENR capabilities, the United States and the IAEA have proposed using an international fuel bank to guarantee the supply of nuclear fuel for civilian reactors to countries that forswear ENR and to international fuel centers to collect and process spent reactor fuel. While such measures would significantly constrain the scope for future nuclear weapons proliferation, numerous countries, including some U.S. allies, are resistant. Their reasons include objection to conceding their right to capabilities some other states already possess, concern that their access to nuclear fuel and energy security could be compromised or manipulated by supplier states for political purposes, and interest in participating as a supplier in a lucrative international market for fuel. The new administration should consider new approaches by which it might overcome the objections that to date have blocked agreement to these nuclear fuel cycle initiatives.

Detecting Nuclear Weapons and Materials

The Nation remains vulnerable to covertly delivered nuclear weapons notwithstanding the considerable progress to date in securing nuclear weapons and materials. Accordingly, considerable effort and resources have been invested the past few years in enhancing the Nation's and the international community's ability to detect and interdict nuclear weapons and materials that are "on the

move," in an effort to defeat nuclear terrorism before it can be perpetrated. This entails numerous national and international programs and organizations. For example, through the Megaports Program and Container Security Initiative, the United States has arranged with host countries for the screening, including for radioactive materials, of container traffic at major ports around the world. Through the Second Line of Defense Program and Proliferation Prevention Initiative, the United States provides partner nations with training and technical capabilities to improve their ability to police traffic across their borders, including movement of nuclear materials.

A global nuclear detection architecture is being created to reduce vulnerability. The Domestic Nuclear Detection Office, an interagency-staffed entity within the Department of Homeland Security, was created in 2005 to integrate efforts like those discussed above and to establish a nuclear detection architecture. DNDO also coordinates the development, testing, procurement, and fielding of more capable radiation detectors. Despite these challenges, tremendous progress has been made in the screening of vehicles and cargoes entering the United States at official points of entry, including general aviation aircraft and small maritime craft, and a start has been made in determining how to enhance detection of illicit nuclear/radiological traffic across other parts of the vast U.S. land and maritime borders by ground, sea, or air transport.

While the detection of nuclear/radiological materials within the vast amount of traffic that enters the United States every day may seem akin to finding a needle in a haystack, it is nonetheless essential to a layered defense system. The detection architecture complicates the attacker's plan, alters his calculus of the chance of success, and helps deter him from attempting the attack. Other layers of the broader defense system enhance the architecture's efficacy, such as intelligence that alerts detection assets and focuses their search. Particular attention must be accorded to improving radiological detection capabilities, which is primarily a technological challenge, and determining the most effective ways to monitor unofficial points of entry to U.S. territory, which is both an operational and technological challenge.

Interdicting Nuclear Weapons and Materials

Detection must be followed by interdiction to defeat the threat. Detection, however, is but one spur of interdiction and not always the most prevalent one. Interdiction will usually be cued by intelligence, and the intelligence will usually be incomplete and of varying levels of confidence. (Indeed, the current limitations of WMD intelligence are profound and need remedy.) Most interdiction efforts will involve requesting foreign partners to investigate and/or take other action on suspicious cargoes, financial transactions, or other activities. Many leads do not pan out, and

when action is taken, it usually will be by law enforcement or other nonmilitary entities. WMD interdiction activity overwhelmingly involves components, materials, and resources contributing to WMD development as opposed to actual weapons, but the interdiction community must be prepared to seize, disable, or otherwise render safe actual weapons. Despite its challenges, interdiction capability is critical to an effective layered defense against nuclear weapons. Interdictions routinely and materially disrupt nuclear weapons and delivery vehicle programs. Like detection, the adversary's awareness of a robust interdiction capability complicates his plan of attack and his calculus of the likelihood of success, thereby helping deter him from attempting not only an attack but even the acquisition or movement of nuclear weapons or materials.

The United States has engaged in WMD-related interdiction for decades. In recent years, this mission has benefitted from greater policy emphasis, improved organizational structure, and new capabilities (including financial interdiction and the Proliferation Security Initiative). The higher profile and expanded capabilities afforded the WMD interdiction mission has enabled a number of impactful interdictions and increased the difficulties and costs of moving WMD-related assets for all proliferators.

Organizational and capability challenges need to be addressed. A prominent organizational seam has been created between those communities focused on the terrorist

WMD threat (the counterterrorism community) and those focused on the state threat (the counterproliferation community). This seam permeates the Government's broader counter-WMD effort, but it is particularly prominent in interdiction. A related interdiction challenge is getting the military, particularly the geographic combatant commands, to recognize counterproliferation interdiction as a distinct and vital mission requiring more and better trained personnel to execute. This begins with ensuring that the priority accorded to interdiction in national strategic and policy guidance is translated into military plans. Among capability challenges, attention needs to be given to strengthening render-safe capabilities for nuclear and radiological weapons, which DHS has identified as a priority but which other elements of the government have resisted due to budgetary concerns.

What Needs to Be Done

Raise leadership awareness of nuclear and other WMD matters. Few general and flag officers have professional experience in or more than a rudimentary exposure to the WMD area, reflecting to an important extent the deemphasis of the nuclear, chemical, and biological missions in the U.S. military since the end of the Cold War. Among civilian leaders, the cadre of WMD experts remains small.

- Ensure civilian and military leaders with responsibilities bearing on nuclear and other WMD matters are knowledgeable about the nature of those threats and effective responses.
- Support WMD education opportunities for senior civilian and military leaders. The Center for the Study of Weapons of Mass Destruction at National Defense University can assist.

Reclaim the spirit and knowledge of an earlier period of robust civil defense and apply it to the present consequence management problem. The United States lacks a robust capability to respond to the consequences of a nuclear detonation. Response has long taken a back seat to prevention. Recent efforts are beginning to fill gaps in nuclear incident guidance to responder personnel.

- Accord a higher priority and more resources to nuclear and radiological consequence management, emphasizing rapid characterization of the event and impacted areas, clear and consistent guidance to the response community at all levels on how to conduct response to a nuclear detonation, equipping and training the response community at all levels, regularly exercising response plans at all levels, and a better understanding of the challenges associated with long-term recovery and restoration.

- Increase public awareness of the effects of a nuclear detonation and the most effective responses that they can make to such an event. Prepare in advance generally applicable messages that would need to be transmitted to the public after the attack.
- Engage allies and partners to develop a common understanding of the challenges of managing the consequences of a nuclear attack, build allied and partner capacity to manage those consequences, and coordinate all respective response planning efforts.

Consider in advance what types of action the United States should take and/or want other nations to take against nuclear threats, which are not feasible absent a crisis but which a nuclear detonation would make possible. Examples might include much stronger actions against rogue nation nuclear programs and terrorist sanctuaries as well as more stringent and verifiable controls on nuclear materials and capabilities worldwide.

Sustain and build upon nuclear attribution gains. Attribution's contributions to deterrence and response are constrained by such factors as a technical nuclear forensics infrastructure and workforce that were built and trained during the Cold War for the Cold War threat, impediments to information sharing with key allies and partners, and process and strategic communications challenges.

- Achieve significant, near-term reductions in the time required to obtain and transport high-quality samples from nuclear detonation sites for forensics analysis.
- Provide the nuclear technical community the resources to revitalize aging laboratory infrastructure and retain and replenish its aging workforce.
- Initiate research and development leading to new or improved scientific approaches and technical capabilities for conducting nuclear forensics analysis, which could make technical forensics far more responsive to policymakers' timely information needs.
- Seek modifications to current law governing nuclear cooperation with other countries to permit the Nation to exchange restricted nuclear information and materials with other countries when necessary to attribute actual or attempted nuclear attacks.
- Revisit the recently agreed articulation of the roles, missions, and integration of the various governmental communities involved in WMD attribution to determine if it can be further rationalized and streamlined.
- Develop a strategic communications plan for U.S. nuclear and other WMD attribution capabilities to enhance their contributions to the deterrence of nuclear and other WMD attacks.

Strengthen U.S. declaratory policy to deter nuclear aggression. Questions have been raised as to whether current U.S. declaratory policy intended to deter the transfer and use of weapons of mass destruction is too ambiguous or broad in scope to be effective.

- Review U.S. declaratory policy intended to dissuade or deter WMD use, acquisition, and transfers in light of current threats, recent experience with North Korea and Iran, and the administration's larger counter-WMD strategic goals.
- Proceed cautiously in considering any narrowing of the scope of current U.S. nuclear deterrence policy to apply only to nuclear threats, as that might make biological and chemical weapons use more likely without significantly advancing nuclear disarmament goals.

Improve capabilities to detect and interdict nuclear weapons and materials. The effectiveness of the nascent global nuclear detection architecture today is most constrained by the limitations of current radiological detection technology and the challenges, operational and technological, of monitoring vast borders where there are no manned, official points of entry. The seam between U.S. counterterrorism and counterproliferation communities, particularly pronounced in the interdiction area, can impede response to WMD threats and foster neglect of the counterproliferation mission.

- Support and extend ongoing efforts to establish and fortify the global nuclear detection architecture, in particular developing more effective radiological detection technology and identifying more effective ways to monitor unofficial points of entry.
- Demand a concerted management effort by senior White House and departmental officials to ensure adequate staffing and resources for both the counterterrorism and counterproliferation missions, robust cross-communication between the counterterrorism and counterproliferation communities, and timely resolution of their jurisdictional disputes.
- Ensure that military planning guidance and operational plans that implement national strategic guidance on counterproliferation interdiction are developed and promulgated and that the geographic combatant commands and military Services accord the priority and resources to the mission consistent with the strategic guidance.
- Strongly endorse, sustain, and build on the Proliferation Security Initiative and Global Initiative to Combat Nuclear Terrorism.
- Invest in more robust render-safe capabilities for nuclear and radiological weapons.

Secure and reduce nuclear weapons capabilities while safeguarding nuclear deterrence. The challenges of further securing nuclear weapons–related materials and capabilities increasingly extend beyond Russia. Efforts to end the proliferation of uranium enrichment and plutonium reprocessing capabilities for civilian nuclear purposes are being resisted by some U.S. allies and other countries. Concerns about the long-term reliability of existing U.S. nuclear weapons pose obstacles to efforts to reduce the risk of nuclear weapons use.

- Increasingly focus cooperative threat reduction activities on countries beyond Russia as the major tasks that can be accomplished in Russia move toward completion.
- Identify new approaches to overcoming the resistance of other countries, including allies and partners, to U.S. and IAEA nuclear fuel cycle initiatives aimed at ending the further proliferation of uranium enrichment and plutonium reprocessing capabilities for any purpose.
- Advance the standing proposal to develop and produce nuclear weapons that are safer, more secure, and reliable over the long term as a means to ensure the sustained effectiveness of a smaller U.S. nuclear deterrent force, or develop as a matter of priority an alternative means to achieve those ends.

Appendix A
WMD Elimination

The 2003 "hunt" for weapons of mass destruction (WMD) in Iraq exposed not only weaknesses in WMD intelligence, but also operational shortcomings in U.S. military ability to locate and secure WMD capabilities in an environment where the cooperation of the host nation is lacking. While military options are neither desirable nor preferred when seeking to reduce and eliminate WMD threats, the U.S. military must be prepared to locate, secure, and eliminate such threats when the security of the United States and its interests is at risk. Whether called to meet the aggression of a WMD-armed adversary, confront the political collapse of a WMD-armed state, or prevent catastrophic WMD proliferation or use, the U.S. military must be prepared to conduct operations necessary to locate and neutralize WMD threats. Today, the United States remains seriously underprepared to meet such a challenge.

In light of the Iraq experience, the Department of Defense (DOD) has taken a number of steps to mitigate the numerous shortfalls. The first step in this process was the establishment of the new mission requirement—WMD elimination—in military doctrine and strategy. Today, *WMD elimination* is the official DOD term for "military operations to systematically locate,

characterize, secure, disable, and/or destroy a state or non-state actor's WMD programs and related capabilities in hostile and uncertain environments."[1]

Establishing an organizational home for this mission followed a long and complicated path, as various commands and Services were reluctant to take responsibility for the mission. In January 2005, U.S. Strategic Command (USSTRATCOM) assumed the overall responsibility for synchronizing and integrating the combating WMD mission, with specific direction to give priority to the elimination and interdiction mission areas. After nearly 2 years of little progress institutionalizing this requirement, the 2006 Quadrennial Defense Review (QDR) required that DOD "establish a deployable Joint Task Force [JTF] headquarters for WMD elimination to be able to provide immediate command and control for forces executing those missions." In particular, the QDR directed DOD to "expand the Army's 20th Support Command [Chemical, Biological, Radiological, Nuclear, and High Yield Explosives] capabilities to enable it to serve as a Joint Task Force capable of rapid deployment to command and control WMD elimination and site exploitation missions by 2007."[2]

After several years, the WMD elimination mission has begun to take hold. In 2007, DOD agreed to the establishment of the Joint Elimination Coordination Element (JECE). During peacetime, the JECE operates under the

command authority of USSTRATCOM via its supporting element, the USSTRATCOM Center for Combating WMD, and is collocated with the U.S. Army 20th Support Command. The JECE will provide operational-level planning, maintain situational awareness, and coordinate joint training and exercises for WMD elimination missions in support of combatant command requirements. Upon request of a supported combatant commander, the JECE will act to enable and/or augment another joint or Service headquarters to become a JTF–Elimination Headquarters (JTF–E HQ) to command and control the forces conducting WMD elimination missions. On a day-to-day basis, the JECE conducts planning and supports combatant command planning, maintains situational awareness of threats and issues, and plans for and participates in training and exercises. At the early stages of a crisis, the JECE would monitor events and determine focus areas, coordinate crisis-specific planning and training, and conduct planning for establishment and deployment of a JTF–E.

Similarly, during peacetime, the commander of the 20th Support Command (who would assume command of a JTF–E upon establishment) is tasked with acting as an advocate for elimination funding and interagency support. As there are a number of agencies and organizations within the government involved in some shape or capacity with WMD elimination, to include the military

Services, the combatant commands, Office of the Secretary of Defense, the Joint Staff, Defense Threat Reduction Agency, Defense Intelligence Agency, Central Intelligence Agency, Department of State, Department of Energy, Department of Homeland Security, the White House, Federal Bureau of Investigation, and the National Laboratories, such coordination skills and ability to leverage resources become critically important. Furthermore, the commander is tasked with overseeing day-to-day doctrine development, training, and execution. In short, the commander is supposed to have (and exercise) the "juice factor" that is critical to ensuring that a JTF–E would be capable of successfully executing its mission should it become necessary to engage in an elimination operation.

If the National Command Authorities determine that the establishment of a JTF–E is necessary to guide operations to locate, characterize, and secure WMD-related capabilities during military operations, the JECE would become, along with significant elements of the 20th Support Command (which operates under the command authority of U.S. Joint Forces Command), part of a JTF–E HQ, enabling command and control of joint forces for the elimination mission. Operational control of the established JTF–E would then be transferred to the supported combatant commander to begin conducting elimination operations. We should note that while the JECE and the 20th Support Command are standing entities that engage

in critical precrisis planning and will be integral parts of an established JTF–E HQ, they by themselves are not a JTF–E or a standing JTF–E HQ. While they can facilitate training, planning, and exercising for such contingencies, they can not *alone* provide command and control of WMD elimination operations or supply forces and capabilities to conduct elimination operations.[3]

After deploying from the United States to the region of concern, the JTF–E would develop, in conjunction with the supported combatant commander and allied state elements, a prioritized task list of WMD-related sites to be investigated. The JTF–E would move with ground maneuver forces to locate, characterize, secure, and disable/destroy the hostile or collapsed state's WMD programs and capabilities. During this time, the JTF–E HQ would analyze new intelligence and data as it became available and update and prioritize its WMD site task list accordingly. The eight JTF–E teams would continue to the next high priority sites when possible and appropriate. Such operations would continue until the state's WMD programs and associated capabilities are secure.

Once the JTF–E is established and in theater, its commander will be responsible for not only the actual investigatory operations involved in WMD elimination, but also a number of other activities. Such duties will include ensuring that the JTF–E HQ acts as a center of focus for WMD elimination efforts, communications,

and continuity. The commander will also have the responsibility to help coordinate and deconflict U.S. Government (military and civilian) and coalition efforts regarding elimination operations. The JTF–E HQ additionally will serve as conduit for reliable WMD-related information for both U.S. and allied militaries. It is clear that as in peacetime, the ability to integrate DOD, interagency, nonmilitary, and non-U.S. assets, capabilities, and knowledge will be critical to mission success in a WMD elimination operation.

Key Challenges

As complex an operation as WMD elimination would be, it should be remembered that it is unlikely to occur in isolation, but rather would need to be executed in conjunction with other critical missions. In addition to locating, characterizing, securing, and, where possible, disabling/destroying WMD capabilities before they can fall into more dangerous hands, U.S. forces would be called upon to conduct other simultaneous challenging missions, such as:

- assisting in-country elements and nearby countries with security and other humanitarian/refugee requirements
- managing a complex operation in which there are multiple factions and countries in pursuit of a different and sometimes conflicting agenda

- interdicting WMD materials, weapons, or components before transit to or transfer from the originating state
- defeating WMD capabilities that pose an immediate risk to the forces and interests of the United States and/or partner nations
- enhancing protection of the U.S. homeland and allied states to include a fully layered defense from the point of origin of the threat to the location of a possible attack.

Each of these critical missions will compete for units, attention from top policy and military leaders, intelligence priorities, scarce logistical capabilities, and conventional ground maneuver forces.

Meanwhile, other challenges that plague normal battlefield operations likely would be present. In the intelligence arena, enormous gaps in information awareness would put a premium on the ability to locate and characterize adversary WMD caches, sites, personnel, and programmatic facilities. Furthermore, WMD elimination operations would rely on high-value/low-density assets, to include highly specialized military units. These units' ability to conduct a variety of high priority missions would create great demand among commanders for their skill in executing competing missions, both within the region and throughout the globe. Consequently, the

relatively low number of these assets could create gaps and shortfalls that could impact elimination operations. Similarly, the U.S. WMD elimination capability is "one deep": DOD could field only one JTF–E comprised of eight individual teams. While a small number of states are developing rudimentary WMD elimination capabilities and units, this mission is still very much a "U.S.-only" game, as it is the only country that has any kind of fieldable elimination capability.

In addition, the enabling capabilities that keep a modern military moving and fighting would be in high demand in a WMD elimination operation. As mentioned, a JTF–E would lean upon conventional ground maneuver forces for its transportation and logistics needs. Similarly, it would rely heavily on U.S. and allied forces for security, force protection, and explosive ordnance disposal units. These units would be critical to ensuring that JTF–E teams can execute their mission without having to shift critical assets from elimination operations to force protection operations. Furthermore, linguistics and intelligence assets that reside in the regional combatant command would be necessary to augment and enable the JTF–E, which might not have indigenous country-specific intelligence analysts or linguists. Finally, it is likely that a JTF–E would rely upon conventional forces for additional communications and reachback capabilities. While ground commanders would most likely want to use these and other

critical enabling capabilities for other important mission areas, it must be stressed that without these capabilities augmenting the JTF–E, the elimination mission could not succeed. A capability that cannot move itself quickly and safely around the battle space is of little utility.

One final challenge centers not on enabling capabilities or the management of bureaucratic actors and competing missions, but resides in operational concepts. Specifically, the elimination mission needs to continue to evolve away from a targeting mindset to an investigatory one. The elimination operation conducted during Operation *Iraqi Freedom* was done in an ad hoc manner that was hampered by flawed planning assumptions and a site-centric approach that placed emphasis on "checking off" suspect sites versus conducting investigatory analysis and continually reprioritizing targets. Consequently, the *Iraqi Freedom* elimination effort continued to be plagued by incorrect intelligence that often was dated by the time that elimination units arrived at sites of interest, weak human intelligence collection, and constantly shifting information and data, which resulted in poorly integrated operational intelligence. The resulting operation became characterized by a targeting mindset that was unable to achieve optimal levels of success. Considering the complexity, size, and number of pieces involved in WMD programs, an investigatory mindset that integrates intelligence analysis, military

operations, and old fashioned detective work is critical in conducting an operation that could be both effective and timely.

What Needs to Be Done?

Despite progress over the last 5 years, the elimination mission is still in its infant stages, support among the Services and commands is tenuous, and concepts and capabilities are still lacking. Moreover, while this niche capability would improve the ability of the United States to respond militarily to the collapse of a WMD-armed state, it is by no means sufficient to deal with large, widely distributed WMD programs and capabilities that such a scenario anticipates in a timely fashion. Neither is this capability a substitute for highly specialized but limited capabilities resident in the intelligence and special operations communities. It is in short a critical, additional capability that could be brought to a larger fight. Without continued growth in both elimination capacity and capabilities, our ability to locate and secure an adversary's WMD capability in a timely fashion could be overwhelmed.

Considering the above issues, we offer the following recommendations on how to strengthen the WMD elimination capability:

- Focus more attention on nuclear weapons programs in unstable states. Specifically, leverage intelligence

to identify key personnel, sites, and infrastructure associated with nuclear weapons programs in states of concern.

- Define the specific targets and goals for the effective synchronization of counter-WMD operations within and among the military and other concerned departments and agencies.
- Establish more specialized counter-WMD forces/units, within both the special operations and general purpose forces so as to reduce mission overlap and mitigate requirements on high-value/low-density assets.
- Increase investment in specialized counter-WMD technical capabilities.
- Establish and improve processes and procedures for coordinating operational responses to large-scale WMD contingencies, both across DOD and the larger interagency community.
- Exercise operational responses to large-scale contingencies on a regular basis, both across DOD and the larger interagency community.
- Broaden international/allied exercises beyond those held with U.S. Forces Korea/Combined Forces Command.

- Develop a U.S.-only WMD elimination exercise series to examine issues deemed too sensitive for bilateral or multilateral exercises.

Notes

[1] *National Military Strategy to Combat Weapons of Mass Destruction* (Washington, DC: Chairman of the Joint Chiefs of Staff, February 13, 2006), available at <www.defenselink.mil/pdf/NMS-CWMD2006.pdf>.

[2] *2006 Quadrennial Defense Review Report* (Washington, DC: Department of Defense, February 6, 2006).

[3] The 20th Support Command (CBRNE) does not have day-to-day authority over the JECE.

Appendix B
WMD Interdiction

Weapons of mass destruction (WMD) *interdiction* refers to "operations to stop the transit of WMD and their delivery systems and associated technologies, materials, and expertise between states, and between state and non-state actors of proliferation concern, in any environment." Interdiction is a broad and complex operational requirement that engages numerous components of the Department of Defense (DOD), Department of State, Department of Energy, Department of Homeland Security, National Security Council, and the Intelligence Community. Key players and processes for WMD interdiction vary significantly depending upon the nature of the cargo and the identities of the suppliers and recipients.

The vast majority of interdiction operations involve components or dual-use items moving to state actors through normal commercial or state-controlled channels that could contribute to the development or delivery of nuclear weapons. The U.S. Government established an interagency focal point for interdiction that allows intelligence analysts and operators to collaborate in identifying and tracking proliferation risks and engage appropriate assets around the globe in interdicting WMD-related materials in transit. This is an interagency-staffed body organized to track and assess WMD interdiction–relevant

intelligence. This interagency focal point then refers its assessments and courses of action for consideration and decisions to an interagency policy coordinating committee chaired by the National Security Council (NSC).

Even so, this focal point for interdiction holds only one piece of the interdiction puzzle, since terrorism-related transactions and the possible movement of high-threat weapons and capabilities fall under the purview of the counterterrorism working groups. Terrorists generally avoid normal commercial channels in moving sensitive material and money. Since experts assess that terrorists would not develop nuclear weapons in the way that states do, any nuclear-related items that they may be suspected of moving or otherwise possessing are much more likely to involve fissile material or other late-stage components of a weapon, if not a weapon itself, than the dual-use building blocks of a state's industrial-scale development program. The National Counterterrorism Center (NCTC), an interagency-staffed body within the Office of the Director of National Intelligence, primarily tracks and assesses the informal channels favored by terrorists. Its assessments are referred for consideration and decision to another NSC-chaired policy coordinating group focused on terrorism. NCTC, therefore, performs an interdiction function similar to that of the interagency focal point, but, unlike the WMD-focused interagency focal point, its remit covers the broad range of counterterrorism activity,

of which WMD terrorism is just one part. Interdictions that may involve the transfer of high-threat items—nuclear, biological, or chemical weapons or weapons-usable material—or involving possible terrorist use of WMD are addressed in highly classified channels and engage highly specialized U.S. Government capabilities. These occurrences are extremely rare, and perhaps unprecedented.

How Did We Get Here?

Since 2002, WMD interdiction has been an increasingly high priority for the counterproliferation community. In December 2002, the *So San*, an unflagged North Korean freighter, steamed toward an unknown destination in the Middle East. U.S. intelligence indicated that in addition to its declared cargo of cement, Scud B missiles were likely also on board. The United States requested that the Spanish government use its naval assets to stop the ship in the Mediterranean and conduct an inspection to ensure that no illicit cargo was on board. On December 9, following initial attempts by the *So San* to evade boarding, Spanish forces stopped the ship and uncovered 15 complete Scud B missiles, 15 warheads, and a missile fuel oxidizer in addition to its declared cargo. Yemen claimed ownership of the Scud missiles 2 days later and declared that it had purchased the missiles from North Korea for defensive purposes under a 1999 contract. At the time, there was no international legal basis

for withholding the missiles and warheads from Yemen. On December 14, the *So San* was released and arrived in Yemen with its full cargo.

This incident brought to light numerous operational and policy weaknesses in U.S. ability to conduct interdiction operations and prevent the transit and transfer of critical WMD-related technologies. Following the *So San* incident, the United States began aggressive new measures to improve its WMD interdiction capabilities and to engage the international community on interdiction matters. In DOD, this included specific strategic planning guidance to establish a DOD "lead" for interdiction activities. Within the interagency community, these efforts included classified strategic guidance and the establishment of several new interagency working groups and committees specifically dedicated to WMD interdiction matters. The most public and "high profile" of these efforts involved the formation of the Proliferation Security Initiative (PSI) and new discussions at the United Nations (UN) to push for a combating WMD resolution—which ultimately became UN Security Council Resolution 1540.

Proliferation Security Initiative

The PSI was proposed in 2003 by President George W. Bush in Krakow, Poland, as a multilateral effort to interdict shipments of WMD and their related materials. Initially, 10 states joined with the United States to form the PSI core

membership. Today, some 90 countries participate in PSI, representing a diverse cross-section of the global community. The initiative is described as "a set of activities, not a formal treaty-based organization." Participants in the initiative are not members of an international organization, nor are they bound to a set of treaty requirements. Rather, participation is voluntary and states adhere to a set of guidelines termed the Statement of Interdiction Principles, which outlines the general nature of PSI and the commitments that members agree to undertake in supporting the effort. The Department of State notes that the level of participation in the initiative varies, but the essential requirements for states to be considered "formal" participants, according to the Statement of Interdiction Principals, are as follows:

- Commit to and publicly endorse the initiative and the Statement of Interdiction Principles.
- Participate in PSI actions, such as interdictions of shipments (on land, sea, and air) and training exercises.
- Contribute specific national assets to the PSI effort, such as intelligence, military, or law enforcement assets.
- Strengthen national legal authorities to conduct interdictions.
- Provide points of contact for PSI interdiction requests and "other operational activities."

PSI seeks to enhance multilateral cooperation via diplomatic channels to improve the number and success of future interdictions. The core states meet regularly and conduct joint training exercises. On any given interdiction activity, only those PSI members who choose to involve themselves will do so.

Member states are expected to take action (consistent with their laws) against vessels transporting WMD, their delivery systems, and related material through their territory or vessels that are flying their flags and transiting through territorial waters. States participating in PSI are asked to institute laws and develop (or improve upon) their domestic capability to interdict and seize shipments of WMD, share information relating to the transport of WMD to states and nonstate actors of proliferation concern, and interdict vessels either within their territory or vessels under their jurisdiction crossing international territory. In addition, members may be asked to take action against vessels suspected of transporting WMD at the request of another PSI member. A PSI member also can seek the permission of another PSI member to interdict a vessel suspected of transporting WMD-related cargo if the state holding jurisdiction is incapable of conducting the operation.

Although much of PSI activity is "informal," it does have a component involving more traditional agreements between states. As part of the initiative, the United States

has entered into ship-boarding agreements with several nations that have open registries. These open registry or flags of convenience (FOC) states have long presented problems for the international combating WMD community. These states allow companies to obtain registries with little or no government restrictions. Because FOC states offer such little oversight over registries and shipping, it provides shippers with a great deal of anonymity, allowing for relative ease in moving illicit shipments. Because FOC states make up such a large portion of global shipping by tonnage, PSI needed to address this issue. The boarding agreements brokered by the United States with FOC states stipulate that the FOC state will either interdict a ship suspected of carrying WMD, their delivery system, and related material, or the state will grant authority to the United States to conduct the operation. To date, the United States has signed boarding agreements with most of the world's largest FOC states.

PSI establishes a common set of principles regarding the transfer of WMD capabilities, facilitates and expands the sharing of information and best practices about interdiction efforts, and encourages a shared purpose and intention to prevent dangerous WMD proliferation. The initiative adds an extra layer to the nonproliferation regime and reduces the options available to nonstate actors and states of proliferation concern

to acquire WMD. Beyond the member nations, PSI has been publicly endorsed by the UN Secretary General and European Union. On April 24, 2004, the UN Security Council adopted Resolution 1540, which "called on states to establish and enforce effective domestic controls over WMD and WMD-related materials in production, use, storage, and transport; to maintain effective border controls; and to develop national export and trans-shipment controls over such items." Resolution 1540 provided PSI with some legitimization. Although it did not go so far as to endorse such controls over the transfer of WMD to other states, it did legitimize an international counterproliferation effort against nonstate actors.

Differences Between PSI and Interdiction Operations

PSI encourages and provides a framework for expanded cooperation among the United States and likeminded nations in preparing for and conducting WMD interdiction activities and facilitated international cooperation in this area. PSI has contributed to numerous actual interdictions of WMD-related items and transactions. Moreover, its very existence complicates and increases the costs and risks for all proliferator efforts to move WMD-related items and materials and to conduct WMD-related financial transactions.

But PSI and WMD interdiction operations are not interchangeable concepts.

PSI *enables* interdiction through the application of the statement of interdiction principles, but PSI is not the mechanism for conducting interdiction operations. PSI provides the peacetime/non-operational backbone of WMD interdiction by providing training for military forces and governmental agencies, and by establishing informational sharing protocols. PSI is also a deterrence tool, demonstrating intent by PSI members to enable or engage in WMD interdiction operations. In addition, it provides a framework for activities and initiatives that enhance interdiction operations. That said, most PSI activities involve unclassified "planning" exercises and are handled via relatively open diplomatic channels. Most of the dialogue with international PSI partners occurs among the ministries of foreign affairs and is generally not suited for the timeframes and operational security requirements of real time interdiction operations. In fact, most actual interdiction activities are driven by intelligence, which is usually highly classified and handled in tightly controlled intelligence channels. Engagement with international partners often involves tightly controlled intelligence or military channels that may or may not include coordination and communication with the PSI "shops" in the foreign affairs ministries.

Importance of WMD Interdiction for Nonproliferation Goals

When interdiction operations successfully prevent the transfer of WMD or key components among states or nonstate actors, the benefits to U.S. nonproliferation goals are obvious and unambiguous. But interdiction operations, and by extension the activities supported by the PSI, convey benefits to U.S. nonproliferation objectives in many other ways as well. By exposing illicit proliferation activities, WMD interdiction can produce significant leverage points for diplomatic efforts in the nonproliferation arena, even if operations fail to prevent actual transfer. Interdiction operations and activities also generate critical intelligence about routes and pathways for WMD acquisition and help to reveal the networks without which WMD proliferation cannot flourish. Moreover, the ability to impose financial sanctions against actors engaged in WMD proliferation and the mobilization of the interdiction-relevant information and capabilities of many foreign partners under the auspices of PSI significantly enhance the nonproliferation toolkit. By extending the financial sanctions authority of Executive Order 13382 to WMD proliferation, the United States can deny access to its financial system to actors engaged in proliferation activities. This is a powerful tool, particularly in motivating foreign financial institutions worldwide to steer clear of identified proliferators, lest they risk losing

access to the single most important national financial system in the world.

What Needs to Be Done?

Improve the level of understanding and cooperation from and among combatant commands with regard to WMD interdiction operations. Lack of understanding about WMD interdiction and its operational and intelligence value among combatant commands greatly inhibits the ability to engage potential interdiction targets in a timely and effective manner. Too often, combatant commands act with excessive caution or insufficient zeal to requests for interdiction operations because the commands do not adequately understand their legal scope for action or do not appreciate how their interdiction of "widgets" can materially impair or delay WMD acquisition activities.

Develop standing operational plans and expedited decision procedures for critical interdiction operations. Lack of planning, procedures, and processes for managing complex interdiction operations greatly hinders our ability to respond to emerging technology and drive down the likelihood that a proliferation transaction will be completed successfully.

Integrate interdiction operations into broader diplomatic and military efforts to reverse proliferation and defend against WMD attack. Interdiction efforts must

be integrated into broader efforts to handle WMD challenges, whether to deal with the prospect of a failed or collapsing WMD state or to enhance diplomatic efforts to prevent or reverse proliferation.

Recognize the value of interdiction operations in generating critical intelligence, enabling forceful diplomacy, and deterring potential proliferators even when such operations fail to find and interrupt the transfer of actual WMD or related components. Most interdiction efforts will involve requesting foreign partners to investigate and/or take other action on suspicious cargoes, financial transactions, or other activities. Many leads do not pan out, and when action is taken, it usually will be by law enforcement or other nonmilitary entities. That said, interdiction capability is a critical element of an effective layered defense against nuclear weapons threats. Despite many dry holes, interdictions routinely are made that materially disrupt nuclear weapons and delivery vehicle programs. And, like detection, the adversary's awareness of a robust interdiction capability complicates the adversary's plan of attack, his calculus of the likelihood of success, and thereby hopefully helps deter him from attempting not only an attack but also even the acquisition or movement of nuclear materials.

Address capacity limits. The interagency decision-making process and interdiction monitoring structure is designed to monitor and respond to a small number of

high-interest targets. Even so, U.S. Government decisionmakers have trouble coordinating responses and issuing guidance within the decision window. Also, the land, naval, and air assets capable of conducting such widely distributed operations are limited. In a larger scale WMD contingency, such as a failed WMD state scenario, the number of land, naval, and air interdictions and potential transit scenarios could expand dramatically, calling for multiple operations in multiple regions that could easily saturate existing capabilities and overwhelm existing decision resolution processes.

Plan for the future of PSI. Most PSI advocates consider its informal and flexible nature among its greatest strengths. The question is whether this approach will be sustained over time. As governments change and the "tangible impact" of PSI becomes less apparent, however, leaders and their constituents may be less inclined to support the initiative. While states may not formally withdraw from PSI, the initiative may see states less willing to commit resources to its activities. PSI may not die per se, but with no formal requirement for states to meet a specific level of support, PSI may exist in name only. As one pro-PSI observer noted, "the success of PSI is . . . dependent on the firm political will of the participating states."

Tackle the dual-use dilemma. The vast majority of components for a state's indigenous WMD or missile programs are "dual use" in nature. Without a clearly

defined set of standards specifically banning certain dual-use materials, the decision of participants to intervene against specific shipments is ultimately a political one. Whose standard applies in determining which materials are worthy of interdiction? Who will be the authority to arbitrate disputes? If the transfer of dual-use materials becomes untenable because of sensitivities to PSI or political disputes, it is unlikely more states will support the initiative.

Address legal limitations. While PSI may be flexible, its participants vigilant, and the interdictions it facilitates effective, the initiative is still constrained by sovereign immunity and other legal constraints. Articles 95 and 96 of the UN Convention on the Law of the Sea grant immunity to warships and noncommercial government ships traveling through international waters. But interdiction operations that occur within international territory also remain highly problematic as jurisdiction is the sole province of the flag state, except under specific conditions such as piracy and drug trafficking. The states of concern to PSI members, such as Iran and North Korea, can circumvent interdictions by using ships that they have deemed for official government use to transport the material they need to construct WMD. While the material is transferred on such a vessel, it is protected by sovereign immunity. While this may slow a state's ability to build a WMD program, it is an easily ex-

ploited measure that protects the material until it leaves the safety of the protected vessel. So as long as the material in question is on a vessel protected by sovereign immunity, interdiction may be viewed as an act of war.

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“. . . the United States and its allies have begun to fear the imminent collapse of the nonproliferation regime . . .”

“. . . a state known to possess a nuclear weapons capability and suspected of possessing both chemical and biological weapons programs stands on the brink of political collapse . . . ”

“. . . analysis of samples from multiple BioWatch sensors has identified a large-scale release of aerosolized anthrax on the National Mall . . .”

“. . . witnesses have reported a blinding flash and mushroom cloud in the seaport area of a major U.S. city . . .”

…and Their Implications for U.S. Policy