PROTECTING AGAINST THE SPREAD OF NUCLEAR, BIOLOGICAL, AND CHEMICAL WEAPONS

PROTECTING AGAINST THE SPREAD OF NUCLEAR, BIOLOGICAL, AND CHEMICAL WEAPONS

AN ACTION AGENDA FOR THE GLOBAL PARTNERSHIP

Volume 1: Agenda for Action

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Foreword

The gravest danger in the world today is the threat from nuclear, biological, and chemical weapons. The most likely use of these weapons is in terrorist attacks. Preventing the spread and use of nuclear, biological, and chemical weapons should be the central organizing security principle for the twenty-first century.

The sudden collapse of the Soviet Union created a vulnerable *supply* of weapons of mass destruction and materials as well as know-how. The rise of global terrorists created a new *demand* for these weapons and the willingness to use them. We are in a perilous new arms race: terrorists are racing to acquire nuclear, biological, and chemical weapons; we ought to be racing to stop them.

Based on the dangers these weapons pose in a volatile post–Cold War climate, I introduced the Nunn-Lugar legislation in the U.S. Congress in 1991 and, with Senator Richard Lugar and others, worked for its passage and implementation. Over the last 10 years, the U.S. Cooperative Threat Reduction Program has evolved and expanded into a $1 billion a year multiagency effort to account for, secure, and dismantle nuclear, biological, and chemical weapons and their associated materials and infrastructure and to prevent former Soviet weapons specialists from sharing their know-how with hostile states and terrorist organizations.

Although this program has had important successes—including the denuclearization of Ukraine, Kazakhstan, and Belarus, and the dismantlement of approximately 6,000 nuclear weapons—there is much unfinished business. More than 20,000 nuclear warheads remain at 123 nuclear weapons storage sites, and a massive 1,350 metric tons of highly enriched uranium and weapons-grade plutonium remain dispersed in a variety of forms and in a variety of secure and insecure circumstances throughout the world's largest network of nuclear facilities, employing nearly 1 million people. Some 40,000 tons of mostly Soviet-made chemical weapons declared under the Chemical Weapons Convention, including nerve gases and skin-burning blister compounds, also reside in Russia, along with the remnants of an extensive biological weapons complex that employed around 60,000 personnel throughout the former Soviet Union at its height.

Countries in Europe, Asia, and North America recognize that this "unfinished business" constitutes a threat to their security. In June 2002, participants at the summit meeting of the Group of 8 (G-8) nations announced the Global Partnership against the Spread of Weapons and Materials of Mass Destruction, saying, "We commit ourselves to prevent terrorists, or those that harbor them, from acquiring or developing nuclear, chemical, radiological and biological weapons; missiles; and related materials, equipment and technology." The partnership included a pledge to raise up to $20 billion dollars from G-8 and other nations over the next 10 years to support specific cooperation projects, initially in Russia with the possibility of expanding to other countries. The partnership also agreed to a comprehensive set

of principles and guidelines for new or expanded cooperation projects designed to remove impediments that have hindered the pursuit of these projects to date. Although this initiative originated at the G-8 summit, some non–G-8 countries have also adopted the principles and guidelines laid out in June and will be called on to play a vital role in the Global Partnership in the years to come.

The G-8 initiative can make a major contribution toward meeting the global challenge posed by weapons of mass destruction and could be a primary building block for the formation of a broader Global Coalition against Catastrophic Terrorism around the world. Its success is imperative.

Protecting against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership is the right publication at the right time. The report aims to provide an essential catalyst for achieving the goals outlined in the G-8 Global Partnership by identifying solutions to bureaucratic and other obstacles that have hampered past threat reduction activities and by outlining an actionable agenda for the future.

The report addresses key challenges in making the Global Partnership work, including how the political momentum for such an effort should be sustained and how to meet the $20 billion funding goal identified at the G-8 2002 summit. Other key questions include how to organize for success, find new ways to manage the nuclear agenda, reduce the biological weapons threat, secure destruction of chemical weapons, and enhance export and border control concerns. It is essential to foster the sustainable transition of the threat reduction relationship with Russia from one of "patronage" to "partnership" and to shrink—toward zero—the risk that nuclear, chemical, or biological weapons will be used.

This report is part of the Strengthening the Global Partnership Project led by the Center for Strategic and International Studies (CSIS) and a consortium of international research organizations under the cosponsorship of the Nuclear Threat Initiative (NTI) and the Carnegie Corporation of New York. It is intended to provide the foundation for the next stage in this project: reaching out to key European, Asian, and North American decisionmakers—in national ministries, in parliaments, and in the EU—on this issue.

The greatest dangers of the twenty-first century are threats all nations face together and no nation can solve alone. We must never forget: the chain of worldwide security is only as strong as the link at the weakest, least-protected site. Clearly, this chain of security cannot be forged by just one, two, or even a dozen countries. It has to involve a worldwide partnership, which must include every nation that has something to safeguard or that can make a contribution to safeguarding it. It is our hope that this project will help make the partnership a reality.

Sam Nunn
Cochairman
Nuclear Threat Initiative

Acknowledgments

Protecting against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership is the product of an extraordinary collaboration of research organizations across the globe. The insights, counsel, and hard work of the dedicated members of this international consortium have made this unique report possible.

The membership of the Steering Committee of the international consortium provided overall direction and individual expertise throughout the formulation of the report. Many thanks are owed to this talented group of individuals, which has developed a strong intellectual platform for its efforts to support the goals of the Global Partnership into the future.

Consortium members include Fen O. Hampson and John Hay of the Norman Paterson School of International Affairs, Carleton University (Canada); Burkard Schmitt of the EU Institute for Security Studies (European Union); Francois Heisbourg and Bruno Tertrais of the Fondation pour la Recherche Stratégique (France); Christoph Bertram and Klaus Arnhold of Stiftung Wissenschaft und Politik (Germany); John Chipman and Gary Samore of the International Institute for Strategic Studies (International); Ian Anthony of the Stockholm International Peace Research Institute (International); Maurizio Martellini and Paolo Cotta-Ramusino of the Landau Network–Centro Volta/Union Scienziati Per Il Disarmo (Italy); Nobumasa Akiyama and Tsutomu Arai of the Japan Institute of International Affairs; Marianne van Leeuwen and Peter van Ham of the Netherlands Institute of International Relations; Sverre Lodgaard and Morten Bremer Mærli of the Norwegian Institute of International Affairs; Alexander Pikayev of the Institute of World Economy and International Relations (Russia); Vladimir Orlov and Yuri Fedorov of the PIR Center for Policy Studies in Russia; Ola Dahlman of the Swedish Institute of International Affairs; and Paul Cornish of King's College London's Centre for Defence Studies (United Kingdom). Considerable input for this assessment was provided by the authors of volume 2: Victor Alessi, Derek Averre, Igor Khripunov, Paul Walker, and Jon Wolfsthal.

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Although volume 1 is a consensus document that went through several drafts and reflects the extensive input from members of the international consortium's Steering Committee, the Center for Strategic and International Studies (CSIS) was responsible for the drafting of the volume and the coordination of the international consortium. Throughout this effort, strong support has been provided by the CSIS

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Funding for the project and report came from the Nuclear Threat Initiative (NTI), whose mission to strengthen global security by reducing the risk of use and preventing the spread of nuclear, biological, and chemical weapons is making the world safer day by day. Particular thanks must go to Sam Nunn, Charles Curtis, Laura Holgate, Brooke Anderson, Joan Rohlfing, Sue Hitchcock, and the other wonderful staff at NTI who, through their strong commitment and constant support, have helped ensure the success of this project.

Robert J. Einhorn
Michèle A. Flournoy
Project Directors

About the Project

Since the end of the Cold War, the United States, Europe, and others have worked with the successor states of the Soviet Union to account for, secure, and dismantle nuclear, biological, and chemical weapons, agents, materials, and infrastructure, as well as to help former weapons scientists and specialists reintegrate into civilian work. In large part, these programs have been successful, but there is much unfinished business.

In June 2002, leaders of the Group of Eight (G-8) nations announced a global partnership against the spread of weapons and materials of mass destruction. In the words of former U.S. senator Sam Nunn, "This global partnership represents a major step in the right direction in terms of how the United States and its partners and allies must work together to prevent dangerous groups from gaining control of the most dangerous materials—materials that could be used to carry out catastrophic terrorism."

The project—Strengthening the Global Partnership: Protecting against the Spread of Nuclear, Biological, and Chemical Weapons—seeks to reinforce and expand upon the objectives of the G-8's Global Partnership against the Spread of Weapons and Materials of Mass Destruction, by building support in Europe, Asia, and North America for assistance programs aimed at reducing the threats posed by nuclear, biological, and chemical weapons and materials.

Over the last year, CSIS has led a consortium of 15 influential policy research organizations in Europe, North America, and Asia as part of a three-year project, sponsored by the Nuclear Threat Initiative (NTI), aimed at strengthening future threat reduction efforts. The consortium has concluded a major assessment, published here, that identifies shortfalls and lessons learned from existing threat reduction programs; recommends future programmatic objectives; and proposes how best to accomplish the remaining tasks.

Based on the findings and recommendations of this study, during the second phase of the project, consortium partners will actively reach out to key constituencies—government officials, parliamentarians, journalists, scholars, and other opinion leaders—to promote governmental and public support for the goals outlined by the G-8 in June 2002 and, in particular, to ensure that the Global Partnership's ambitious funding target ($20 billion over 10 years) is met.

This four volume set, entitled *Protecting against the Spread of Nuclear, Biological, and Chemical Weapons: An Action Agenda for the Global Partnership,* is designed to assist the reader in assessing threat reduction programs to date and identifying priorities for the future. The assessment consists of four volumes:

Volume 1: Agenda for Action
Volume 2: The Challenges
Volume 3: International Responses
Volume 4: Russian Perspectives and Priorities

For more information on the project, please visit our Web site at <http://www.csis.org/isp/sgp/index.htm>

Project Partners

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Russia—Institute of World Economy and International Relations (IMEMO)
Sweden—Swedish Institute of International Affairs
United Kingdom—Centre for Defence Studies, King's College London
United States—Center for Strategic and International Studies

CHAPTER 1

Introduction and Summary

The disintegration of the Soviet Union in 1991 raised urgent questions about the ability of its successor states to control a vast weapons of mass destruction (WMD) complex, as well as the weapons themselves. Tens of thousands of Russian nuclear warheads and hundreds of tons of nuclear weapons-usable materials were scattered at dozens of inadequately secured sites. Virtually overnight, Ukraine, Kazakhstan, and Belarus were left in possession of almost 4,000 nuclear weapons. Over 40,000 tons of chemical weapons (CW) were located at seven major storage sites. The Soviet Union's huge biological weapons (BW) complex comprised perhaps 20 major facilities and several dozen related ones, mainly in Russia but also in other successor states. Faced with desperate economic conditions, tens of thousands of scientists, engineers, technicians, military personnel, and others employed in WMD-related activities posed a proliferation risk.

In response to this enormous threat, the United States, Europe, Canada, and Japan have assisted Russia and other states of the former Soviet Union in reducing strategic nuclear forces and eliminating CW; in securing nuclear and other WMD-related materials, equipment, and technology against theft or seizure; and in addressing concerns about nuclear reactor safety and the environmental impact of Soviet-era military programs.

Much has been accomplished by the U.S. nonproliferation and threat reduction assistance programs (generically known as the "Nunn-Lugar" programs for their original sponsors, Senators Sam Nunn and Richard Lugar) and by similar programs pursued by European and other countries. But after more than a decade of effort, the task remaining is huge.

The countries of North America, Europe, Japan, and Russia have long recognized that this "unfinished business" constitutes a threat to their security. But the September 11, 2001, attacks in the United States—and the realization that highly organized and resourceful terrorist groups are actively seeking WMD and would have little hesitation in using them—have heightened their awareness of the threat and dramatically increased the urgency of efforts to prevent dangerous weapons, materials, equipment, and technology from falling into the hands of hostile countries or nonstate actors.

Those countries increasingly recognize not only that WMD proliferation constitutes a common threat but also that they must share responsibility for reducing that threat. Threat reduction programs that had their origin largely in bilateral U.S.-Russian nuclear arms reduction agreements—and that therefore placed the lion's share of the burden on the United States—must now become a central preoccupation of a broad international coalition and a strengthened, coordinated effort.

The G-8 Initiative

The leaders of the G-8 countries rose to this challenge at their June 2002 summit meeting in Kananaskis, Canada, by adopting a G-8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. They committed their countries "to prevent[ing] terrorists or those that harbor them from acquiring or developing nuclear, chemical, radiological and biological weapons; missiles; and related materials, equipment and technology." They agreed to raise up to $20 billion over the next 10 years—with half coming from the United States and half from the other G-8 countries—to support projects, initially in Russia, to address nonproliferation, disarmament, counterterrorism, and nuclear safety (including environmental) issues. In addition, the leaders approved implementation guidelines for new or expanded cooperation projects that were designed to overcome impediments that contributing countries had encountered in the past in their dealings with Russia. The G-8 members also invited other countries to join and contribute to the initiative.

By setting ambitious funding targets, addressing obstacles that have hindered cooperation to date, and pledging a multiyear, collaborative international effort, the G-8 Global Partnership has the potential to make a major contribution toward overcoming the WMD challenge. Whether that vast potential will be realized or squandered, however, depends on the determination of G-8 and other governments to follow through on their commitments—and on whether they have the ingenuity and political will to translate the promising but general framework contained in the Kananaskis G-8 statement into concrete actions.

But the resolve and creativity of governments will not be enough. Achieving adequate support for Global Partnership programs in the world's leading industrialized democracies will require elected officials to make hard choices among competing priorities, which in turn will require the backing of well-informed citizens. Therefore, if the G-8 and other countries are to forge a truly effective partnership against global WMD threats, governments must be joined by parliaments and publics.

The Strengthening the Global Partnership Project

Nongovernmental organizations can play an important role in building the necessary support for cooperative threat reduction. For the past year, our 15 policy research institutions in the United States, Canada, Japan, Russia, and other European countries have joined together in an unprecedented effort—funded by the Nuclear Threat Initiative and the Carnegie Corporation of New York—to produce a comprehensive assessment of national and multilateral threat reduction programs, to raise public awareness of them, to outline an actionable agenda for future threat reduction programs, and to strengthen the political consensus in favor of them in our respective countries. Our consortium of "think tanks" strongly supports the G-8 Global Partnership adopted at the Kananaskis summit. Indeed, after Kananaskis, we decided to call our project "Strengthening the Global Partnership." Much of our

work since the summit has been devoted to considering how the Global Partnership can best be implemented.

We have produced this four-volume report to evaluate threat reduction efforts to date and chart a course for the future. Volume 1 outlines the group's principal findings and recommendations. Volume 2 contains analyses of each of the main functional areas, including fissile materials, chemical and biological weapons, weapons dismantlement, export controls, and "brain drain." Volume 3 is a collection of reports written from the perspective of the contributors, including European states, the European Union (EU), Canada, Japan, and the United States. Finally, volume 4 reports on Russian experiences with past and ongoing programs and perspectives on the future.

Key Findings of the Report

One of the report's main findings is that the relationship between contributing countries and Russia in the threat reduction effort should be transformed from patronage to partnership. Although the contributing governments have not intended their assistance efforts to embody the negative features typically associated with donor-recipient relationships, Moscow has often perceived threat reduction assistance in that light—and clearly that must change. That means treating Russia not as a dependent client but as an equal partner who must be fully integrated into the design and operation of specific projects as well as the planning and guidance of the overall effort.

With this more central role for Russia comes greater responsibilities, both for increasing its own financial contribution and for removing impediments that have long plagued threat reduction programs with Moscow (e.g., bureaucratic obstacles, inadequate transparency and access to work sites, resistance to providing tax exemptions and liability protections). In a number of cases, the failure to resolve these problems has meant that contributing states have been unable to proceed with projects for which funds had already been made available. The Kananaskis "guidelines" were designed to remove these impediments. Unless Moscow acts decisively to support the Global Partnership and to meet the requirements of the guidelines, contributing governments will be reluctant to authorize the release of additional resources.

In terms of funding priorities, this report concurs in principle with the "priority concerns" identified in the G-8 statement—namely, destruction of CW, disposition of fissile materials, dismantlement of decommissioned nuclear submarines, and employment of former weapons personnel. At the same time, in view of the growing dimensions of the worldwide proliferation and terrorist threat, programs aimed at preventing terrorists and hostile states from acquiring WMD or their ingredients deserve the highest priority.

We believe, moreover, that the varied expertise, geography, and interests of contributing states will influence the particular projects to which they choose to devote their own energy and resources. Given the magnitude and diversity of the challenge, this inclination of different governments to focus on different objectives should not

be a problem as long as all critical objectives receive adequate support. Indeed, the overall effort will often benefit from a conscious division of labor, with some partners pursuing projects that others might be unwilling or unable to pursue.

However, with projects carried out largely on a bilateral basis between contributors and recipients and with contributing countries often setting their own priorities, there is a compelling need for effective coordination. A good first step was the creation of a G-8 Senior Officials Group charged with overseeing the Kananaskis agreement and ensuring that its commitments are fulfilled. The group should meet regularly and invite representatives of contributing non–G-8 governments to participate. But coordination *within* governments will be just as important as coordination *among* governments. High-level coordinators or coordination mechanisms are required in Russia and in contributing governments and multilateral institutions to overcome bureaucratic obstacles, promote well-integrated national or institutional efforts, and provide authoritative points of contact.

Another finding of our group was that, given improving economic conditions in Russia, emphasis should increasingly be placed on self-sustaining solutions to the WMD problem so that external assistance for threat reduction in Russia and other states of the former Soviet Union can be substantially reduced by the end of the decade and eventually phased out. This will require various tools, including commercialization, retraining, and retirement, to help downsize Russia's vast WMD infrastructure without increasing proliferation risks. It will also require preparing Russia to become capable on its own, after assistance has ended, of ensuring security at WMD-related facilities remaining after downsizing.

A Summary of the Project's Recommendations

On the basis of these principal findings, our group adopted a concrete set of recommendations, which are summarized briefly just below and discussed in more detail later in this volume.

Sustaining political momentum. The Global Partnership should be a key theme at future G-8 and other high-level bilateral and multilateral meetings. Large, immediate contributions to high-profile, cash-starved projects such as chemical weapons destruction and nuclear submarine dismantlement could help keep political and public attention focused on the initiative. As G-8 chair in 2003, France should press others to make new contributions to the Global Partnership so that pledges will reach the $20 billion mark by the time of the Evian summit in June 2003. Looking ahead, the partners should agree on specific milestones that could be achieved in key programs before the 2006 G-8 summit in Moscow. Annual reports should be issued by the outgoing G-8 chair on progress achieved.

Meeting funding requirements. National commitments by G-8 members will be the largest source of new funding, especially in the near term. Several members have already pledged new funds, and others must be urged to follow suit. Although fixed budgets until 2006 mean prospects for increased funding by the EU are limited in the near term, EU spending on threat reduction could increase sub-

stantially in the latter half of the decade. To help meet the Kananaskis target, holders of Soviet-era and Russian debt may wish to waive debt payments in exchange for additional threat reduction expenditures by Moscow, which could be deposited into a multilateral fund controlled by Russia and its partners. G-8 members should also approach non–G-8 countries, especially in Europe, to contribute to and participate in the Global Partnership. As a means of encouraging its partners to exceed their $10 billion share of the $20 billion target, the United States should treat its planned contribution of $10 billion over the next decade as a floor, not a ceiling.

Organizing for success. The G-8 Senior Officials Group should be a mechanism for genuine multilateral coordination, not just information exchanges, and should allow representatives of non–G-8 countries to participate. It should report progress and problems to G-8 leaders and receive annual guidance from them. In Russia, the appointment of Deputy Prime Minister and Finance Minister Alexei L. Kudrin to coordinate all national threat reduction efforts is a welcome step. In addition, Russia's capacity to absorb assistance—in terms of qualified personnel and bureaucratic structures—should be upgraded. Within contributing states and the EU, senior coordinators or coordinating mechanisms should be established to ensure that Global Partnership efforts are well integrated.

Clearing away implementation roadblocks. To remove obstacles that have inhibited cooperation and could discourage contributors from making new commitments, the Russian Duma should ratify the U.S.-Russian Umbrella Agreement that governs conditions for U.S.-Russian programs as soon as possible. Then, consistent with the guidelines agreed to at Kananaskis, Moscow should promptly conclude comparable arrangements with other contributing governments and entities (e.g., the EU) or, alternatively, consider adopting a federal law dealing with threat reduction assistance that would provide the necessary exemptions and protections to all contributors. In general, contributing states and Russia should review existing legislation applicable to threat reduction programs with a view to modifying provisions that have hindered those programs (e.g., U.S. certification requirements that blocked threat reduction expenditures for several months in 2002; the Russian Law on State Secrets, which has precluded the necessary transparency and access).

Managing a multifaceted nuclear agenda. In addition to continuing the U.S. effort to help dismantle former Soviet strategic nuclear delivery systems, the United States—and the United Kingdom and France where appropriate—should assist Russia in accelerating the consolidation of its strategic and tactical nuclear weapons at a reduced number of secure storage sites. In this effort, all parties concerned, not just Russia, should provide greater transparency on the numbers and locations of nuclear weapons in Europe, and partners should offer to help Russia accelerate the reduction of tactical weapons. In the area of materials protection, control, and accounting (MPC&A), a new European-sponsored program could help complete security upgrades at civilian sites currently covered by the U.S. program, allowing the United States to concentrate more on military facilities. Contributing countries in Europe and North America, together with the International Atomic Energy Agency (IAEA), should also undertake a program

under which excess highly enriched uranium (HEU) would be removed from vulnerable sites in the former Soviet Union, any remaining HEU would be secured, and HEU-fueled reactors would be shut down or converted to operate with low-enriched fuel. Moreover, ongoing efforts to render bomb-grade nuclear materials no longer usable in nuclear weapons should be accelerated by doubling the blend-down rate for Russian HEU and by funding the construction of facilities needed to convert Russian plutonium into mixed-oxide fuel for burning in civilian reactors. Finally, to head off serious proliferation and environmental risks, Russia, Europe, and Japan should work together to dismantle Russian general-purpose nuclear submarines and manage the safe and environmentally sound disposition of their reactors, fuel, and radioactive wastes.

Diminishing the biological weapons threat. An urgent task is to increase the security of pathogen collections at Russian and other former Soviet civilian facilities. In addition, to allay long-standing concerns about access and openness at key military installations of the former Soviet BW complex, personnel and facilities from Russia's Ministry of Defense and their counterparts in the United States and Europe should be integrated into threat reduction efforts (including in combating bioterrorism). Europeans should also work with the United States in finding sustainable ways to engage former Soviet research, development, and production capability to promote accelerated development and production of drugs, vaccines, and innovative medical technologies. These efforts should be integrated into health care systems as well as toward protecting civilian populations against BW attacks. Cooperation with Russian former BW entities should also include facilities currently under the supervision of nonmilitary entities, including the Ministries of Agriculture, Health, and RAO Biopreparat.

Securing and destroying chemical weapons. With Russia's CW destruction program now benefiting from capable leadership and significant financial support from Moscow, there is a pressing need for stepped-up external assistance to help Russia destroy its huge CW stocks by the final 2012 deadline set by the CW Convention (CWC). A sensible division of labor would make the United States primarily responsible for funding an expanded destruction facility at Shchuch'ye and the Europeans responsible for a large facility at Kambarka. Pending destruction, the security of CW stocks should be ensured. To do its part, the U.S. government will need permanent authority to waive current legislative restrictions, which have produced lengthy delays in destroying CW.

Fostering sustainable threat reduction. To consolidate and downsize Russia's WMD infrastructure in a manner sustainable for Russia and without heightening WMD proliferation risks, the United States and Europe should expand programs (such as the U.S. Initiative for Proliferation Prevention, European and U.S. initiatives focused on nuclear cities, the International Science and Technology Center Partners program, and some TACIS programs) aimed at providing self-sustaining commercial and other civilian opportunities for former weapons scientists and institutions. Russian entrepreneurs and Western corporate enterprises should become an integral part of this effort and be considered not only targets for assistance but also potential consumers of and investors in technology. The Russian

government should adopt measures (e.g., tax credits) that would make it attractive for Russian businesses to hire former weapon scientists and workers, especially from the "closed nuclear cities." As part of their mandates, assistance programs should include facilitating retirement, retraining, and resettlement of WMD personnel, both former weapon scientists and specialized military officers. Preparing Russia to maintain high levels of security at WMD facilities after external assistance is reduced requires that efforts be pursued now to help Russia produce the necessary equipment indigenously, to train the necessary personnel, and to instill a culture of security in all personnel working at such facilities. In addition, the Russian government should create incentives for Russian facility managers to devote the necessary resources and attention to maintaining high levels of security.

Bolstering national export controls and border security. The effective export control and border security systems of the European states, Canada, and Japan put them in a strong position to supplement existing U.S. assistance efforts in this area. These countries should continue to work with Russia and other states of the former USSR—a significant number of which still have weak export controls and porous borders with one another—in the training and equipping of customs services and border guards, in improving internal compliance mechanisms and information sharing at the level of enterprises, in developing tools to control "intangible" transfers of proliferation-sensitive information, and in automating licensing systems. Key contributing countries should cooperate with Russia and other NIS countries to develop a strategic plan that evaluates the export control and border security systems in the region, identifies needs and priorities, develops a set of best practices, and establishes a division of labor for assisting regional states to strengthen their capabilities.

The Challenge Ahead

The international community faces no greater challenge in the twenty-first century than stopping the proliferation of WMD to states and dangerous subnational groups. The Global Partnership against the Spread of Weapons and Materials of Mass Destruction, which was launched in Kananaskis, is a major step toward meeting this challenge. But without the continuous, high-level attention of governments as well as the sustained support of legislatures and public opinion, the opportunities created by the G-8 summit agreement may be lost. Our nongovernmental organizations can play an important role in mobilizing the necessary support. In the period ahead, we are determined to work actively with each other and within our respective societies to ensure that the funding targets set at Kananaskis are met or exceeded, that these additional resources are put to their most effective use, and that the ambitious goals of the Global Partnership are fully realized.

CHAPTER 2

Strengthening the Global Partnership: Findings

The Strengthening the Global Partnership Project made the following basic findings:

1. **Over the past decade, international threat reduction efforts have made major progress, especially in helping dismantle the former Soviet strategic nuclear arsenal. But the work is far from finished; Russian nuclear, chemical, and biological materials, weapons, and expertise still pose grave proliferation risks that urgently need to be addressed.**

The United States has spent about $7 billion over the past decade through a variety of Nunn-Lugar threat reduction programs. European countries, Canada, and Japan also contributed to these efforts, although in smaller amounts. As a result, Ukraine, Kazakhstan, and Belarus have been denuclearized. Over 800 strategic launchers, 97 heavy bombers, 24 ballistic missile submarines, and 815 ballistic missiles and related silos were destroyed pursuant to U.S.-Russian arms reduction agreements. The EU as an institution spent more than €700 million on nuclear reactor safety in the former Soviet Union and billions of euros to help stabilize the successor states socially, politically, and economically. The world's largest anthrax production facility, located in Kazakhstan, was dismantled. The first prototype CW destruction facility in Russia is ready to start operating. Projects funded by the International Science and Technology Centers have engaged more than 50,000 WMD scientists, helping to prevent the spread of their expertise into dangerous hands.

But enormous challenges remain. "Rapid" security upgrades have been completed at facilities containing only 46 percent of the approximately 603 metric tons of weapons-usable nuclear materials in Russia targeted by the U.S. Department of Energy's MPC&A program, and "comprehensive" upgrades are only now getting under way. Less than one-seventh of Russia's total highly enriched uranium stockpile has been rendered unusable for nuclear weapons and virtually none of its plutonium. The same is true for the United States. None of Russia's nerve agent CW has yet been destroyed, a task that will also stretch out over the coming decade. Its former military biological weapons program continues to remain closed to outsiders, and physical protection against theft or seizure of biological pathogens is inadequate at a number of locations. Finally, thousands of weapons scientists and workers are still unemployed or underemployed. If current Russian downsizing

plans are implemented, many will be laid off in the next few years, but it is unclear where they will find new jobs.

2. Reducing the danger that weapons, materials, or expertise will fall into the hands of substate terrorist groups or states of proliferation concern should be the highest near-term priority. At the same time, the traditional focus on safe and secure dismantlement of weapons systems, as well as their disposal, remains the best long-term solution to the WMD problem.

For much of the 1990s, the focus of threat reduction was on the safe and secure dismantlement of Russian nuclear weapons and their delivery systems, largely to ensure that requirements imposed by U.S.-Russian arms reduction agreements were met. Of course, there was also a nonproliferation benefit since the secure dismantlement and subsequent long-term storage of nuclear weapons would prevent their spread beyond the former Soviet Union's borders. Moreover, some programs were clearly designed with nonproliferation in mind; for example, the Science and Technology Centers based in Moscow and Kiev helped prevent a "brain drain" of former Soviet weapons scientists by providing tens of thousands of them with civilian work in their own countries. Still, the early focus of threat reduction programs was more on disarmament than on nonproliferation.

In the past several years, however, WMD proliferation, particularly to terrorist groups acting to wreak destruction or disruption on a massive scale, has increasingly been recognized as a clear and present danger. Substate actors have amply demonstrated their interest in both acquiring and using WMD. The 1995 chemical weapon attacks by Aum Shinrikyo in a Tokyo subway resulted in 12 dead but might have killed thousands if it had been executed more professionally. The Al Qaeda network has been seeking nuclear weapons and has made repeated attempts to buy stolen nuclear material and to recruit scientists. Evidence discovered in Kabul, Afghanistan—including crude bomb design drawings and extensive downloaded materials on nuclear weapons—confirmed Al Qaeda's interest. Videotapes also made it clear that the organization had an active test program for chemical arms.

The October 2001 anthrax attacks in the United States demonstrated a high degree of technical sophistication, but low-tech WMD or terror may present an even more attractive avenue for these groups. The most well-known example of biological terrorism occurred in 1984 in Oregon when the Rajneeshee cult contaminated salad bars with salmonella. More recent speculation has focused on the "dirty" or "radiological" bomb, which could be fashioned from widely available radioactive materials and explosives. Such a bomb, set off in large metropolitan areas such as Berlin, New York, or Moscow, might kill small numbers of people compared with a nuclear weapon, but could contaminate large areas for decades, have a significant, negative economic impact, and cause major social disruptions. Unfortunately, this is not science fiction. A U.S. citizen with Al Qaeda ties was recently arrested on suspicion of planning such an attack, as were six Lithuanians suspected of trying to buy nuclear materials for a dirty bomb.

Russia's WMD infrastructure remains a prime target for those interested in illicitly acquiring weapons, material, or expertise. Over the past decade, according to the International Atomic Energy Agency, there have been 18 incidents involving the

seizure of stolen highly enriched uranium or plutonium that have been confirmed by the relevant states. Among the most troubling cases was a failed conspiracy in 1998 by insiders at one of Russia's largest nuclear weapons facilities to steal enough highly enriched uranium to build such a weapon. Moreover, Russia has reported that known terrorists may have conducted at least two surveillance missions of nuclear warhead storage sites in the past year. These reports paint a disturbing picture, but just as disturbing is what we do not know. The U.S. intelligence community, after studying the question of nuclear security in Russia, concluded recently that "undetected smuggling has occurred, although we do not know the extent and magnitude of such thefts." Reported events may therefore constitute only the tip of the iceberg.

3. September 11, 2001, demonstrated that prevention through threat reduction is less costly than dealing with the consequences of an attack. That is an important factor for the G-8 countries and other contributors to keep in mind as they seek to fulfill their Kananaskis threat reduction commitments.

The toll from September 11 was staggering. Aside from the thousands of dead and wounded and the profound psychological impact on the people of New York City, Washington, D.C., and the rest of the world, the economic loss suffered by New York alone in the first month after the attack was estimated to have been approximately $105 billion. Scores of businesses disappeared, and close to 200,000 jobs were destroyed or relocated out of New York City. Moreover, with globalization, the economic consequences of such an attack are not confined to the targeted locality or country; they have a ripple effect throughout the world. The worldwide airline industry, for example, suffered losses of $17 billion in the year following September 11, with job losses at European airlines exceeding 20,000 and transatlantic freight traffic falling off an average of 3 percent each quarter since the attack.

Current spending on threat reduction programs pales in comparison to the possible consequences of a terrorist WMD attack. It has been estimated that the detonation of a nuclear weapon in lower Manhattan could in the near term reduce the U.S. gross domestic product by 3 percent or approximately $300 billion and incur losses of trillions of dollars in the longer term. Yet current spending in the United States on threat reduction programs amounts to only about $1 billion per year.

4. Cooperation under the Global Partnership can play an important role in strengthening multilateral regimes designed to stop the spread of WMD.

Strengthening multilateral agreements designed to stem the spread of WMD remains an important goal for the members of the Global Partnership. In that context, threat reduction efforts can both complement as well as reinforce the international nonproliferation regime.

A significant example is the assistance provided to Russia in meeting obligations under the CWC to destroy its large stockpile by 2012, the final deadline permitted by that agreement. Without that assistance, Moscow would be unable to meet its obligations, calling into question the continued viability of a major international agreement. Foreign assistance designed to upgrade the security and accounting of nuclear materials in Russia complement global initiatives, led by the

International Atomic Energy Agency, to help other states improve the security of their nuclear materials and to amend the Convention on the Physical Protection of Nuclear Material to cover not just nuclear material in international transport but also material in domestic use, storage, and transport. Programs to secure pathogen collections, strengthen biological materials export controls, and help former biological weapons research and production facilities find civilian pharmaceutical, health, and environmental applications can work hand-in-hand with the BWC to help rid the world of BW.

5. As agreed at Kananaskis, substantial additional resources should be devoted to threat reduction in the next decade. Although the priorities of participating countries for assisting others may differ, the task is so large and diverse that it is possible to accommodate the perspectives of each contributing country.

Meeting the summit target of $20 billion for threat reduction programs poses a significant challenge for the G-8 and other countries that can only be met using a variety of funding mechanisms. In the near term, bilateral contributions may provide the most realistic avenue for increased funding. Since the summit, the funding pledged by some of the G-8 members has increased dramatically. Over the next decade, the United Kingdom has pledged to contribute $750 million and Germany $1.5 billion. At Kananaskis, Japan reaffirmed its pledge to contribute $200 million. The United States pledges to provide $10 billion over the decade. Some other G-8 partners and non–G-8 countries may soon follow suit.

The EU will be another important source of funds. At Kananaskis, $1 billion was pledged by the EU over the next 10 years. Past multilateral European funding has focused largely on nuclear safety, with a smaller amount provided for other threat reduction programs under Europe's Common Foreign and Security Policy (CFSP) and with contributions to the International Science and Technology Centers provided through the Technical Assistance to the CIS (TACIS) program. Although there is only limited scope to pursue a greater EU contribution in the near term under fixed budget ceilings, the real prospect for securing a substantial increase will occur in 2006 when a new budget cycle for the EU will come into effect. European countries will need to begin to build a consensus for such multilateral funding in 2003 when the 1999 Joint Action on Nonproliferation will be renewed.

Finally, new funding mechanisms, including multilateral ones, could lead to an increase in contributions to the Global Partnership or facilitate the fulfillment of existing pledges. The Kananaskis statement cites the option of "bilateral debt for program exchanges" as one possibility. That refers to the "debt for nonproliferation swap" that is now being looked at seriously by the Bush administration. A decision to use such a swap mechanism could be attractive to some key European countries because they hold most Soviet-era and Russian debt owned by sovereign creditors.

Just as important will be arriving at a sensible division of labor among contributing countries. The G-8 and other contributors all share a commitment to strengthening security through the Global Partnership. But building on diverse experiences and expertise, they have differing approaches on how and for what purposes assistance should be provided to Russia and other states of the former Soviet

Union. For example, Scandinavian countries keenly feel the environmental threat posed by Russia's large, decommissioned fleet of nuclear submarines next door on the Kola Peninsula. Japan shares those concerns about Russia's submarines in the Far East. The United Kingdom is more focused on issues related to nuclear weapons, nuclear materials, and biological warfare given its previous experience in all three areas. Germany, building on its own experiences with CW destruction, is concentrating on that task, and it also feels very strongly about nuclear safety for civil and military facilities. Goals may be diverse, but the extent of the problem is large enough to allow countries to focus largely on their own priorities, provided that all critical threats get adequate attention. Moreover, this diversity of approaches makes effective coordination among contributing countries and with Russia indispensable for putting available resources to their most effective use.

6. **The current relationship with Russia in the area of threat reduction assistance should be transformed from patronage to partnership. That transformation carries with it both new responsibilities for Russia—greater political and financial support for Global Partnership activities—and also new advantages and privileges, such as a greater role in their planning and execution.**

The Russia of 2003 is different from the Russia of 1991. The danger of political unrest and economic disintegration has receded. Reforms are being enacted, and the economy is no longer in desperate straits. Moreover, practical cooperation with the West, both political and economic, is now seen as an inescapable requirement given Russia's fundamental need for growth and Eurasian stability.

In view of these developments, the time is ripe for transforming Moscow's relationship with the G-8 and other countries in the area of threat reduction assistance from patronage to partnership. That means new responsibilities for Russia. One important responsibility will be an increased financial contribution to cooperative threat reduction efforts. Russia's funding has been uneven in the past and certainly much less than that provided by outside contributors. In recent years, Moscow's funding has increased, reaching hundreds of millions of dollars annually. That contribution must continue to grow and should be accompanied by steps to ensure that Moscow's budgetary commitments are transparent.

Second, Moscow should redouble efforts to ensure effective implementation of these programs. That will mean putting into place sufficient qualified personnel and effective organizational mechanisms to ensure proper handling of the anticipated increase in projects. It will also mean overcoming barriers highlighted in the G-8 summit declaration that have hampered the efforts of outside contributors in the past. These include taxes on assistance, inadequate protections for foreign contractors from being held liable for accidents at or near work sites, and lack of access to sites to ensure that agreed objectives are met and funds are properly spent. Without determined steps by the Russian government to fulfill the requirements of the Kananaskis Guidelines for New or Expanded Cooperation Projects, the prospect of increased funding by other contributors will be jeopardized.

But the new arrangement will also mean new benefits—first and foremost that Russia will be treated as a security and scientific partner rather than as a client.

Given its own substantial financial contribution, Moscow should be more fully integrated into all aspects of planning, design, and implementation of specific projects as well as the overall direction of the Global Partnership reduction effort.

Moreover, the shift to a new relationship would help encourage the support of additional segments of Russian society for Global Partnership projects. Implementation of debt for nonproliferation swap arrangements could help to engage key Russian agencies like the Ministries of Finance and Economic Development, which have so far not been heavily involved in threat reduction programs. Representatives of major businesses in Russia have already begun to realize that it is beneficial for them to establish a predictable and sustainable environment for their efforts to flourish. They recognize that threat reduction efforts are an important tool in that context. Major entrepreneurs can better their relations with foreign partners and improve domestic acceptability of threat reduction efforts through exerting political influence inside Russia. In short, major Russian businesses could help facilitate the success of threat reduction assistance and serve overall Russian economic interests at the same time.

A true partnership will serve long-term threat reduction interests. Although assistance from other countries will be important for some time to come, a long-term objective will be to return this responsibility to Russia.

7. Cooperative threat reduction is too important to be held hostage to differences between Russia and contributing countries on other issues.

In spite of growing cooperation between Russia and the West on a variety of political, economic, and security issues, some remaining differences threaten to undermine support for threat reduction efforts. For example, concerns in the United States about assistance by Russian entities to Iran's nuclear and missile programs have dampened political support in Washington for threat reduction assistance. The same is true concerning continued suspicions in Washington that Russia has not accurately declared its CW stockpile as required by the CWC and that it may be continuing work prohibited by the BWC.

These matters are clearly important; they deserve to be addressed and resolved. If they are not resolved, they could make it more difficult to sustain the necessary political support in contributing countries for threat reduction assistance. However, the danger to international security posed by the possibility of WMD leakage to other states or substate actors is such that funding for cooperation on Global Partnership projects should not be linked in law or policy to finding solutions to these outstanding differences.

8. With Russia back on its feet, greater emphasis should be placed on self-sustaining solutions to the WMD problem that will allow contributors to reduce assistance at the end of the decade. A number of tools, including commercialization, retraining, and retirement, can help cope with the effects of downsizing Russia's WMD infrastructure. Ensuring security will also be important for the infrastructure that remains after downsizing.

Over the next decade, the G-8 countries and other participants in the Global Partnership face two challenges on this front. First, they need to ensure that the WMD

infrastructure is downsized without increasing the proliferation threat. Second, they must aid Russia in maintaining high standards of security at remaining WMD facilities once outside assistance tapers off. Even with downsizing, Russia will still have an enormous WMD infrastructure that will have to be well protected.

Some EU TACIS programs, International Science and Technology Center activities, and national technology cooperation programs by Western countries already serve these objectives. It will be necessary to expand such efforts and improve coordination among them.

The Global Partnership will have a number of tools at its disposal. First, commercialization will play an important role in creating a self-sustaining solution for those parts of the WMD infrastructure that will literally be out of a job. The approach is that government will work with the private sector to mate scientific expertise, formerly used for WMD purposes, to commercially viable projects. Russian civilian industrial centers can create new jobs at home and abroad.

For example, software and programming activities, though promising, remain on a small scale. The huge pool of underemployed Russian mathematicians and physicists could be turned into high-end computer programmers, ideal for developing complicated programs of the future, like air control systems to handle the huge increase in aviation traffic. Russia could become an offshore programming powerhouse like India, whose software exports now amount to $7 billion per year.

The Russian government has identified biotechnology as a target industry for the twenty-first century. In addition to providing a potential commercial platform for former biological weapons experts, this focus could help address the critical gaps in health care and support the development of innovative medical technologies and products. Similar efforts to develop novel laser applications, nanotechnologies, fuel cells, and other cutting-edge technologies should be explored.

Facilitating downsizing without creating proliferation risks will require more than commercialization. Additional programs will be necessary. Aside from continuing support for basic research and development projects, programs for early retirement may be an effective and affordable approach. For example, Russia currently has plans to cut its nuclear weapons infrastructure by 75,000 employees, many of whom will retire. One Russian official has suggested that 2,000 of his workers could be retired with a $500 pension supplement, a cost of $1 million per year. Retraining is another possibility. A number of avenues are available, including programs run by private sector firms where individuals find new jobs. Finally, creating public sector employment opportunities could prove useful. Former WMD scientists and technicians could make valuable contributions in environmental remediation projects and other fields, such as energy research and development.

The second major sustainability challenge is ensuring that high standards of security will be maintained at remaining WMD facilities even if assistance tapers off. A recent Russian survey of 14 sites with weapons-usable nuclear material found that all of the managers who responded believed they would have serious problems maintaining adequate security if U.S. assistance was phased out. U.S. threat reduction programs have tried to follow practices that encourage sustainability over the long term. For example, indigenous Russian companies manufacture much if not all of the equipment used to upgrade security at Russian nuclear warhead storage

sites. Moreover, the United States has begun a number of training programs designed to instill in a cadre of professionals a "culture of security." Nevertheless, more work needs to be done, not only in the nuclear area but in the CW and BW areas as well.

Aside from providing sufficient funding for specific security programs, there needs to be a broad-based educational campaign by nongovernmental organizations, academic institutions, and the media both to improve the professional skills of personnel at WMD-related facilities and to educate the public. Such a campaign should explain the rationale for the nonproliferation regime, its legal foundations, and the consequences of violating its rules. Nongovernmental organizations should also band together to demonstrate the importance of nonproliferation to the general public.

CHAPTER 3

Strengthening the Global Partnership: Recommendations

Sustaining Political Momentum

Without sufficient follow-up, the long list of challenges posed by the Kananaskis statement could erode and eventually overwhelm good intentions. The announcement of new financial contributions by some G-8 members is a good start, but additional steps should also be taken.

1. Secure the strong, consistent support of national leaders as well as key national opinionmakers.

After the Kananaskis summit, the Global Partnership should be a key theme at future high-level bilateral and multilateral meetings. Annual G-8 summits will provide important opportunities to emphasize continuing support, as will periodic G-8 foreign minister meetings. Regular reports to G-8 leaders by the Senior Officials Group, together with periodic guidance to the group by the leaders, will serve both to ensure effective oversight and to maintain political momentum. Government representatives from non–G-8 countries with a strong interest in threat reduction should also be invited to attend the Senior Officials Group. Finally, governments participating in the Global Partnership should take advantage of every opportunity to demonstrate to key legislators, journalists, and other national opinion-makers that money spent on these programs is a sound investment in terms of security and other national interests.

2. Encourage high visibility projects to help build momentum right away.

The G-8 partners, together with other contributors, should select a few projects where progress can be made both visibly to the general public and in the near term. For some projects, all that is needed is money and publicity. CW destruction could benefit from a cash infusion. Russia also could begin almost immediately to dismantle its retired general-purpose nuclear submarines with a cash infusion, since the infrastructure and expertise are in place courtesy of the U.S. program to dismantle Moscow's ballistic missile submarines. Norway, a non–G-8 country already actively involved in threat reduction programs, is concerned about the potential problems caused by these submarines and could quickly capitalize on good working relationships with Russia to lead this effort, drawing on the support of other European countries, Canada, and Japan.

3. **Establish the Global Partnership initiative as a high priority for France's chairmanship of the G-8 in 2003.**

Canadian leadership was crucial to the Kananaskis outcome. In preparing for the early June 2003 summit in Evian, the French government should seek concrete ways to give further impetus to the Global Partnership. President Jacques Chirac recently stated, "In 2003, under the French presidency, all the necessary impetus will be given to this programme's implementation." One important objective should be to ensure that, by the time of the Evian meeting, pledges of contributions to the Global Partnership reach the $20 billion mark.

4. **Make the Global Partnership a key theme for the 2006 G-8 summit in Moscow.**

Aside from highlighting Moscow's new partnership role in dealing with WMD, the summit would provide an opportunity to review progress on the Global Partnership almost halfway into implementation. The partners may also want to set specific milestones to be met by the time the summit is held.

Meeting Funding Requirements

The cost of coping with the WMD challenge may exceed the funding target of $20 billion, but raising even that amount will prove challenging. The most promising avenue in the short term is increased bilateral commitments from the G-8 partners and other countries. Several contributors have already announced increased funding for the next decade. The remaining G-8 members should follow suit. Other avenues for raising funds include the following:

1. **Expand EU funding by 2006.**

Given fixed budget ceilings for current EU programs, significant near-term increases in EU Global Partnership–related projects do not seem realistic. However, a substantial increase in funding will be possible beginning in 2006 when a new European Community budget is in place. A first step in that direction will be to renew the 1999 joint action—scheduled to be discussed in early 2003—which provides the institutional basis for threat reduction funding. Renewal will also ensure at least a minimum of continuity and visibility for EU threat reduction efforts. Once that has been accomplished, member states should agree that the Global Partnership is a critical priority for CFSP and that significantly increased funding should be provided for it.

2. **Use debt swaps to finance Global Partnership projects by creating a multilateral Russian Nonproliferation Fund.**

Although the Kananaskis statement includes debt swaps as a method for raising funds, only a few countries so far have expressed publicly their intention to consider exchanging debt owed by the Russian government for additional nonproliferation expenditures by Moscow. Partners should take advantage of this opportunity to increase their commitments to threat reduction. Europe and Japan hold much of

the $41 billion of Paris Club debt, $33 billion of which is from the Soviet era. As a major holder of debt at a little over $5 billion, Italy could play a key role in pressing ahead. (Germany, the largest holder of Paris Club debt, has so far been cool toward the idea of debt swaps.) Rome and Moscow have already discussed the issue, and Italy should now seek to mobilize others to help make this proposal a reality. Japan and France follow with about $3 billion each. If the United States decides to use this funding vehicle, the initial focus would probably be on Soviet-era debt totaling about $2.7 billion, but there is no reason why additional Russian-era debt of a little over $1 billion could not also be included.

Rather than pursue this approach as the basis for bilateral programs, which would encourage a welter of swaps earmarked according to national priorities, contributors should consider funneling a substantial portion of these funds into a multilateral arrangement, a Russian Nonproliferation Fund. These funds might be used in larger projects where joint funding is needed, perhaps CW destruction. Establishing a multilateral fund would also be more in line with Russia's new role as a partner. Russia and other contributors would appoint a board of directors that would decide how funds would be spent.

3. Urge non–G-8 countries to contribute to the Global Partnership.

The Kananaskis statement invites additional countries to enter into discussions with the G-8 on joining the initiative. G-8 members, individually or collectively, should approach other governments, especially in Europe, and encourage them to do so, offering them a role in mechanisms designed to coordinate the efforts of contributing countries.

4. Make the U.S. contribution of $10 billion over the next decade a floor, not a ceiling.

The U.S. commitment of $10 billion—half of the funds pledged in Kananaskis—is an important step forward but only codifies what the United States had already planned to spend over the next decade. Yet many experts believe Washington should be spending more on these programs. Washington's willingness to go beyond its anticipated financial commitment will reaffirm its leadership role and the importance with which it views multilateral efforts to deal with WMD. It will also be a powerful tool in leveraging contributions from the G-8 members and other contributors.

Organizing for Success

In view of the political, financial, and substantive scope of the Kananaskis initiative, proper implementation will almost certainly require organizational measures in addition to the "annual review" mechanism specified in the G-8 statement. On an international level, the challenge will be to ensure better multinational coordination to avoid needless duplication and to ensure the highest priorities are being addressed. The national challenge, both for states providing assistance and for Russia, will be to clear up bottlenecks that hamper implementation. The recommendations follow:

1. Ensure genuine multilateral coordination, not just information exchanges.

Contributors to the Global Partnership should move beyond the practice of the past, when delegations met occasionally to provide each other with informational briefings on national programs, to active coordination of their efforts. They have already taken a first step by establishing a Senior Officials Group (at the undersecretary level) that will meet regularly on implementing the G-8 initiative. Those meetings should become the focal point of coordination by setting priorities, identifying gaps and new funding needs, and resolving thorny problems. A working-level group might meet more frequently to ensure that any decisions are properly implemented. These sessions should eventually include non–G-8 contributors as appropriate.

As for individual projects, contributors should use a variety of different mechanisms for coordination, depending on the project itself and its funding mechanism. For example, an informal ad hoc working group of government officials already meets to coordinate assistance for CW destruction. In other cases, existing organizations might play an important role. For example, the Arctic Military Environmental Cooperation Program—a trilateral arrangement involving the United States, Russia, and Norway—is already implementing initiatives related to environmental security. In other cases, it may be necessary to create a new mechanism. Although contributors have been meeting informally, the construction of new facilities in Russia to convert weapons-origin plutonium into mixed-oxide reactor fuel might be best handled by a new international organization.

2. Promote effective coordination within Russia.

President Putin's appointment of Deputy Prime Minister and Finance Minister Alexei L. Kudrin to chair an interagency committee responsible for ensuring the success of Global Partnership efforts in Russia is a welcome development. Minister Kudrin's committee should be empowered to coordinate across ministries and agencies, participate in the budget process (including the integration of foreign assistance with Russia's own budget), respond rapidly to any roadblocks that arise with any contributors, and be equipped with a small operational staff. Clearing up problems with implementation, whether they involve inadequate cooperation on the part of certain Russian bureaucracies or issues such as taxes and liability, will be a top priority. Another responsibility for the coordination committee will be to monitor international assistance to ensure that contributors understand when some projects have more than enough money and when others are experiencing shortfalls. In fulfilling this mandate, the new coordinator and his staff would work closely with foreign partners as well as regional and local governments and nongovernmental organizations, have the authority to establish commissions designed to break through bureaucratic roadblocks, and be empowered, with presidential approval, to initiate legislation in the Duma.

The interagency working group established under Minister Kudrin should include not only Russian agencies directly involved in threat reduction activities (e.g., the Ministries of Atomic Energy, Foreign Affairs, Defense, and the Munitions Agency), but also other key executive institutions such as the Presidential Adminis-

tration, the Office of the Prime Minister, the Federal Security Service, and the Ministries of Finance and Economic Development.

3. Improve Russian capacity to absorb international assistance.

Current Russian bureaucratic structures, staffing levels, and lack of experience in dealing with foreigners are inadequate to support a robust multilateral assistance effort. The same is true for several of Russia's neighbors. The creation of a larger cadre (including at the regional level) of Russian interlocutors—empowered to deal with foreign teams, familiar with Western negotiating and contracting approaches, trained in Western program management techniques, skilled in maneuvering through the maze of Russian bureaucracies, ideally English- or German-speaking—will be necessary if the Global Partnership is to put additional resources to effective use. These broad-ranging objectives will require a variety of measures. As contributors design individual threat reduction programs, some funding should be devoted to training for Russian counterparts in key skills, such as program management and foreign languages. Also, Russian personnel who are losing their jobs because of weapons complex downsizing but have experience with foreigners in the area of threat reduction, or other assistance issues, may be retained to work on Global Partnership programs.

4. Improve coordination and implementation within contributing partner governments.

Contributors should take steps to ensure that their governments are organized for effective implementation. One important step will be to ensure integrative thinking at senior levels. In the case of the United States, a senior White House official, probably the deputy national security adviser, should preside over an interagency committee charged with setting government-wide priorities, avoiding overlap between programs administered by different U.S. agencies, and ensuring that threat reduction and other U.S. assistance programs in Russia (e.g., for community development) are effectively reinforcing each other. Other contributing countries should take similar steps to ensure high-level coordination. Moreover, their enhanced efforts may require increasing the number of personnel working on threat reduction and creating bureaucratic focal points for running these programs, as Canada has recently done. Contributing governments may also wish to set up mechanisms, formal or otherwise, that enable them to draw on the advice and resources of private sector groups and nongovernmental organizations.

5. Improve coordination between the EU's two pillars.

The EU has the unique possibility to coordinate European Community projects run by the commission with national European member states' projects. To maximize synergies requires that stronger coordination be performed under the heading of the EU Joint Action on Nonproliferation and Disarmament, which was launched in 1999 by a council decision. This would foster the coordination of the EU's two pillars and increase effectiveness. Reorganization of the current institutional setting and an increase in the EU staff in charge of threat reduction–related efforts would be needed to achieve this objective. Additional consideration should be given to the

appointment of an overall coordinator for Global Partnership activities for the EU and its member states. Regular meetings of national officials responsible for the implementation of projects should be organized by the Committee for Nonproliferation (CONOP) within the frame of the EU joint action. This would help promote the Nonproliferation and Disarmament Cooperation Initiative (NDCI), the goal of which is to reinforce overall coordination of government-supported threat reduction programs in Russia and the former Soviet Union.

Clearing away Implementation Roadblocks

Threat reduction programs in Russia have in the past suffered from serious implementation problems. Aside from complaints about bureaucratic obstacles within both the Russian and contributing governments, a number of technical problems have adversely affected implementation. First, Russia has not been sufficiently responsive to contributing countries' requirements for effective monitoring, auditing, and transparency measures to provide reassurance on how funds are spent, particularly their requirement for access to sensitive facilities such as nuclear weapons storage sites. Second, while contributors want to exempt assistance from taxes, duties, levies, and other charges, Russia argues that it is legally unable to grant an exemption from regional and local taxes without a government-to-government agreement in place authorizing it to do so. Third, there are inadequate protections in Russia for foreign contractors who need exemptions from liability for accidents at or near work sites. Finally, Russia has complained for some time that too much assistance has been spent hiring non-Russian contractors.

A key obstacle to resolving such implementation problems has been the lack of uniformity in agreements covering these matters, not just between Russia's agreements with the United States and its agreements with other partners, but also between individual projects conducted by a given partner. Agreement at Kananaskis on "guidelines for new or expanded cooperation projects," which were designed to address these problems, was indispensable to gaining G-8 support for the $20 billion funding target. Hopefully, the guidelines will provide the political impetus to achieve greater standardization and more conscientious implementation in the future.

Still, contributors should realize that, given the practical realities of running projects in a country as large and diverse as Russia, legal agreements might not always conclusively resolve implementation difficulties. But Russia should understand that the willingness of other countries to provide billions of dollars of assistance in the future would depend on its readiness to fulfill the requirements of the guidelines.

1. **Russia should ratify the Cooperative Threat Reduction Umbrella Agreement with the United States.**

The 1999 bilateral agreement provides far-reaching guidelines for dealing with all of the technical problems that have plagued the implementation process. Yet Russia has been hesitant to give this agreement the force of law by submitting it to the Duma, in part because of a concern that it may cede too much sovereignty to outside powers.

By applying the terms of the agreement provisionally, the United States and Russia have managed to move forward with threat reduction programs without ratification. But with the prospect of drastically increased foreign assistance for threat reduction efforts, Russia should now seek ratification as soon as possible and in any event before the Duma elections scheduled for December 2003. Once ratified, the provisions of the agreement, which only cover some U.S. programs, should be considered as a model or precedent for rules governing Global Partnership arrangements with other partners. In addition, the Duma should be encouraged to ratify the Agreement Establishing the International Science and Technology Center (ISTC), an intergovernmental agreement that has operated provisionally since 1994 and that extends beyond the United States and Russia to the EU and eight other countries.

2. Extend protections in the U.S.-Russia agreement to other contributors.

Moscow should promptly conclude arrangements with other contributing governments and entities that afford them the same protections extended to the United States. Currently, most contributors who fund threat reduction programs operate under a patchwork of bilateral and other arrangements (e.g., some projects are administered through the multilateral International Science and Technology Centers). Although this patchwork may suffice in the near term—most of these arrangements provide limited protections that are still sufficient to move forward—ratification of the U.S.-Russia Umbrella Agreement will create a new important legal precedent. Extending those protections to other contributing governments and entities (e.g., the EU) might be done by multilateralizing the U.S.-Russia agreement, developing a separate umbrella agreement covering the Europeans and perhaps Japan and Canada, or concluding a series of discrete measures that would supplement and remedy the patchwork of existing bilateral arrangements. An alternative to the conclusion of new implementation agreements between Russia and contributing countries or entities would be the adoption by Russia of a new federal law (see next item).

3. Streamline existing legislation and enact laws designed to ensure smooth implementation of Global Partnership programs.

Congress should give President Bush the permanent authority he has requested to waive the certification conditions that must be met to permit U.S. expenditures under the Department of Defense's CTR program. Under current legislation, the U.S. government has to certify a number of conditions annually, including that Russia is committed to comply with its arms control obligations. In spring 2002, the Bush administration told Russia not to expect certification because of concerns about Moscow's withholding of information about its CW stockpile and biological warfare infrastructure. In July, the Congress temporarily allowed a waiver of the certification requirement to permit rapid expenditure of funds by September 30. The final version of the fiscal year 2003 defense authorization bill, currently under negotiation, is expected to include a more extensive waiver.

Aside from obtaining a permanent waiver, the United States should seek to modify selectively its federal acquisition regulations (FAR), which were designed to ensure that contractors receive fair access to government contracts but have some-

times had the effect of severely hampering threat reduction efforts. The regulations require U.S. contracting officials to confirm in person that work has been done to their satisfaction. Yet there may be situations where that could prove difficult—for example, security upgrades at sensitive nuclear weapons storage sites. The competitive bidding process required by the FAR can also result in long initial program delays. The United States should take a flexible approach to the FAR, including amending them where necessary, to ensure they do not hamper threat reduction efforts. Other contributors should be alert to these potential problems (such as the frequent insistence of donors that their own businesses receive the bulk of national threat reduction expenditures) as they ramp up their own threat reduction programs.

Russia should modernize its own legal and regulatory structures to accommodate Global Partnership programs. For example, instead of considering and ratifying a significant number of bilateral umbrella agreements with contributing countries (see item 2 above), the Russian Federal Assembly might adopt a federal law—consistent with the Kananaskis guidelines—regulating taxes, liability, and the immunity status of threat reduction assistance programs. The president could also ask the lawmakers to amend some existing laws, such as the Russian Law on State Secrets, with the aim of lifting barriers to providing the level of transparency and access required to facilitate those programs.

Managing a Multifaceted Nuclear Agenda

Early in the past decade, the highest U.S. priority was to dismantle former Soviet strategic nuclear delivery systems as mandated by arm reduction agreements. That effort has made significant progress, though over the next decade hundreds of additional missiles and their launchers still need to be destroyed.

As the decade progressed, other programs concerned with stopping the spread of nuclear capabilities—securing and accounting for nuclear warheads and materials and disposing of stocks of nuclear materials that might be used in building weapons—gained in importance. Some G-8 countries, by virtue of their nuclear power and research capabilities, have been interested in the disposition of nuclear materials and could also contribute their expertise to materials protection, control, and accounting. Another priority, at least for several European countries and Japan, is dismantling decommissioned general-purpose nuclear submarines and disposing of their radioactive waste and old reactors.

1. Accelerate the consolidation of Russia's nuclear weapons stockpile.

For the past 10 years, Russia—with U.S. assistance—has been consolidating its large stockpile of strategic and tactical nuclear weapons at a reduced number of more secure storage sites. That process has been moving slowly and could take well into the next decade, especially since implementation of the recent U.S.-Russia strategic arms treaty could result in thousands of additional nondeployed strategic warheads. The wide dispersion of Russia's arsenal raises concerns about the physical security of these warheads, particularly tactical nuclear weapons. Consolidation of

this stockpile could be accelerated through building larger railcars with greater capacity or by increasing the size of trains transporting these weapons or the frequency of their trips. Other nuclear weapons states of the G-8—the United Kingdom and France—could help with this effort if necessary, just as they did during the early 1990s when nuclear weapons were transported out of Belarus, Ukraine, and Kazakhstan back to Russia. Security upgrades at warhead storage facilities should also be accelerated.

2. Increase transparency of tactical nuclear weapons.

In addition to the consolidation of nuclear weapons at fewer, secure locations, all parties concerned (i.e., not just the Russians) should provide greater transparency on the numbers and locations of nuclear weapons in Europe, perhaps in the framework of the new NATO-Russia Council. Contributors to the Global Partnership could provide, where needed, technical assistance to Russia to ensure the security and accurate accounting of Russia's tactical nuclear weapons, which have never been covered in any formal treaties or agreements. The relatively small size and portability of these weapons—as well as the fact that many older models do not contain locking or safing devices protecting them against unauthorized use—make them attractive for theft or seizure by states or terrorist groups.

3. Accelerate the destruction of tactical nuclear weapons slated for elimination.

Moscow and Washington agreed to important reductions of tactical nuclear-weapons stockpiles in 1991 and 1992. In Russia, the pace of destruction of these warheads has suffered from the priority given to the dismantlement of strategic nuclear weapons. Increased financial and technical assistance to Russia, particularly from European countries, could accelerate the process.

4. Create a complementary European materials protection, control, and accounting program.

The United States has made important progress in securing Russia's nuclear materials, although concerns have grown about small facilities with weapons-grade and other nuclear materials that might be used to build nuclear weapons or dirty bombs. Security upgrades (both rapid and comprehensive) are planned for completion by the end of 2008. That effort could be further accelerated by providing additional financial resources and increasing the number of U.S. employees and teams assigned to design and implement the upgrades.

Europe, through Euratom, has already provided Russia with a small amount of assistance in this area but generally has not been directly involved in the improvement of control and accounting at individual facilities. Rather, its efforts have focused mainly on the development of a state infrastructure for accounting, including implementation of information systems, the development of inventory-taking methodologies, and personnel training.

Building on those existing relationships, a European-sponsored program could take the lead on efforts to provide security upgrades at civilian sites currently covered by the U.S. program, allowing a division of labor in which the United States

focuses on projects at weapons-related facilities, such as establishing control and accounting at nuclear weapons serial production facilities. Some precedents already exist for European assistance at civilian sites. For example, Norway and Sweden have helped Russia with security upgrades at the civilian icebreaker fleet in Murmansk.

5. Establish a program to secure or remove excess highly enriched uranium (HEU) from vulnerable sites.

Such an effort is most urgently needed for small, insecure stocks of HEU-based research reactor fuels. At present, there are well over 100 research reactors in more than 40 countries worldwide that operate with HEU, including Russia, Ukraine, Kazakhstan, Belarus, Latvia, and Uzbekistan. Operators of such reactors often do not have the financial resources to ensure adequate protection for the fresh or irradiated fuel. Working with the IAEA and Russia (especially in the case of Soviet-origin research reactors), contributing countries should approach countries where potentially vulnerable HEU is located, assist in returning the fuel to the state that supplied it, help ensure the security of any remaining fuel, and encourage the operators to shut down or convert the research reactors to use low-enriched fuel not usable in weapons. The United States, Russia, and the IAEA recently cooperated in the removal to Russia of a substantial amount of HEU from a research reactor near Belgrade. Some members of the Global Partnership may wish initially to focus on potentially vulnerable HEU in the states of the former Soviet Union. Others, however, may wish to address needs outside the former Soviet Union in light of the global dimensions of this problem.

6. Accelerate the disposition of highly enriched uranium and weapons-usable plutonium.

The G-8 countries should accelerate their efforts to render stocks of fissile materials no longer needed for weapons unusable for that purpose. Although Russia and the United States, with the cooperation of other G-8 countries, have established programs to dispose of 500 tons of HEU and 68 tons of plutonium, those programs suffer from a lack of urgency or funding or both. First, the blend-down rate of HEU should be doubled from 30 to 60 tons a year. The current rate is determined by what government officials believe the commercial fuel market will bear, not the actual or future capacity of Russian blend-down facilities. The additional reactor-grade uranium produced on the accelerated blend-down schedule would be securely stored in Russia and gradually released onto the market. Second, the partners should quickly move forward with building the facilities needed to convert Russian plutonium into MOX fuel that can be burned in civilian reactors. That will mean raising $2 billion needed for the task. Finally, the G-8 countries should consider further engaging market forces in accelerating disposal by bundling front-end nuclear supply and back-end spent-fuel management services. One approach would be to establish an international company to lease fuel derived from weapons-usable plutonium and highly enriched uranium to nuclear power utilities and take back the spent fuel for safe and secure management and disposal. This lease approach could relieve utilities of all liability for spent fuel, freeing them to use those funds to subsidize the use of weapons materials for reactor fuel.

7. Dispose of Russia's nuclear submarines as well as associated radioactive waste and reactors by the end of the decade.

Moscow's growing number of retired general-purpose nuclear submarines—as well as the radioactive waste and old reactors associated with them—pose a grave environmental risk that is keenly felt by Russia, Europe, and Japan. They also pose a serious proliferation risk. The submarine fuel in most cases is HEU and in many cases has cooled down enough in terms of radioactivity so that it is no longer self-protected against theft.

Europe, Japan, Canada, together with Russia, should undertake an effort to dispose of general-purpose submarines in a safe and environmentally sound manner. The Russian government has recently estimated that approximately $4 billion would be needed to fund ship and vessel disposition and environmental rehabilitation of radiation hazardous sites. Russia should fund much of this effort; however, other countries should fill the funding gap. Some costs might be recouped by recovering and blending down highly enriched uranium from spent reactor fuel. Drawing on U.S. experience working with Russian shipyards, the multilateral initiative could move forward right away at the Nerpa, Sevmash, and Zvezdochka shipyards, even as U.S. dismantlement of ballistic missile submarines is being completed at the latter two sites. Other facilities may need to be upgraded, because some retired submarines are not located near these shipyards.

As for decommissioned Russian nuclear submarines located at bases that serve the Russian Pacific Fleet, Japan and Russia should make a concerted effort to break the impasse over implementation issues—Russian immobility on a liability waiver has been a key problem—and move forward with short-term initiatives to deal with those submarines. Of the $200 million pledged by Japan to the Global Partnership, $120 million is for Russian submarine dismantlement. If implementation problems can be overcome, these funds should be used at Russian Pacific facilities with acute problems in defueling, dismantlement, transportation, and storage. Funding provided for defueling and reactor removal facilities for the Pacific Fleet would negate the need to create a dismantlement facility in the Far East other than the Zvezda shipyard in Bolshoy Kamen. Support should be provided to the Zvezda shipyard to undertake a steady program of submarine dismantlement, starting with the oldest boats first.

In addition, a comprehensive plan should be formulated for managing the radioactive waste created by the decommissioning of Russian submarines. The Nordic countries, working through the Northern Dimension Program and supported by the EU, are in the initial phases of an initiative to deal with the spent fuel at Andreeva Bay, but other sites remain neglected, such as Gremikha Naval Base. Partner countries might consider funding dismantlement of aging and unsafe floating reloading bases and tankers used for transporting radioactive waste.

Diminishing the Biological Weapons Threat

Keeping elements of the former Soviet BW program from contributing to offensive programs by states or substate terrorist groups should be a critical priority for the Global Partnership. Since the late 1990s, U.S. and European efforts to deal with this

danger have increased, but a number of critical challenges remain, including the urgent one of increasing the security and accountancy of potentially vulnerable pathogen collections.

1. Build bridges to Russia's military BW program.

The BW experts of the Russian Ministry of Defense (MOD) currently do not participate in threat reduction activities. The MOD also has repeatedly denied entry to facilities that had been part of its BW complex, including four key installations at the core of the military complex. To build transparency and eventually redirect expertise and facilities to peaceful uses, the United States, in cooperation with European countries, should begin a confidence-building process. The initial focus should be on common challenges presented by bioterrorism. This could include establishing cooperative programs between the Russian MOD and organizations in the United States and Europe. That might encompass a broad range of activities from consultations between civil protection authorities to an expansion of current projects on biodefense to an aggressive research and development program into vaccines, medicines, and diagnostic tests, as well as studies of anti-crop warfare and potential threat agents. If this process is successful, it may be possible to pursue dismantlement of potential BW production sites in the military complex and redirect work to peaceful activities, such as the production of vaccines and the development of antiviral drugs and other projects to meet pressing health problems in Russia and the Third World. Some practical issues will have to be addressed, such as the legal prohibition against employees of the MOD accepting direct financial support from outside sources for cooperative research and development activities. Because BW-related facilities currently under the supervision of nonmilitary entities (e.g., RAO Biopreparat) might also become sources of leakage of dangerous pathogens and expertise, they also should remain a priority for cooperation with the U.S. and European organizations.

2. Encourage the Russian government to create an institutional environment more amenable to Global Partnership programs.

At present, jurisdiction over bio-facilities of concern is divided among a number of different agencies or companies, including the MOD, some of which have long resisted threat reduction projects. The Russian Munitions Agency (RMA) could perform a very useful coordination role, but has not been given the specific mandate for threat reduction programs. To create a more favorable environment for increased Global Partnership assistance, the Russian government should direct individual ministries and agencies to participate in the full range of appropriate activities and mandate the RMA to act as a coordinator and clearinghouse. If necessary, certain responsibilities could be transferred to that agency.

3. Broaden the coverage of current BW threat reduction efforts.

Many Russian and NIS civilian facilities that still possess pathogen and toxin collections and dual-use equipment have received little or no outside assistance. Most facilities also have little knowledge of or access to export control information. A number of European countries—for example, the United Kingdom, France, Ger-

many, Switzerland, and Sweden—have highly developed biotechnology industries, as well as experience working on biodefense and with infectious diseases. In the short term, in coordination with U.S. efforts, they could fan out and work to increase security and accounting for pathogen collections. Initial contacts in this context could provide insights into potential scientific research and technology development partnerships that can be pursued under other programs.

The Global Partnership could also help institutions make a long-term transition from working on military programs to civilian applications. Commercial opportunities exist in these institutions but have been largely confined to very specific research and development projects and are insufficient to support a larger microbiology and biotechnology industry. Assistance is needed to develop realistic business plans, identify viable products, and provide training in research and technology management. Areas could include cancer vaccines and therapies, new types of antibodies, improved vaccines, antiviral drug screening, and pharmaceutical development and production to meet pressing health problems, particularly in Russia.

The Global Partnership can help establish centers of scientific excellence, innovation centers, and international research laboratories that can host international research teams working on critical global problems, including emerging and reemerging infectious diseases, HIV/AIDS, multidrug-resistant tuberculosis, and malaria. It can also promote cooperative work in biodefense to protect civilian populations from BW attacks. This could include sensor technologies, prevention (vaccines), and therapies (antibiotics, antivirals, and other new approaches). In addition, the partnership could step up efforts to bring Russian laboratories and production facilities up to international standards.

As part of this effort, the ISTC's Science Partner Program and the U.S. Bio-Industry Initiative should pursue new collaborative programs devoting more resources to retraining BW scientists and the provision of transferable skills, including business management training, marketing, intellectual property protection, communication support, and other aspects of "soft technology." The objective would be to turn Russian scientific research into an internationally viable science, technology, and innovation partnership.

Securing and Destroying Chemical Weapons

The international community has recently recognized the need to take more concerted action in destroying Russia's 40,000 tons of chemical agents. Underlying this renewed sense of urgency is recognition that the threat of CW falling into the hands of terrorists is real and that the fate of this stockpile has important implications for the future of the CWC. Moreover, Russia has now found capable leadership to manage the destruction program and has begun to allocate significant resources to this goal. Although it may be difficult to achieve, every effort should be made to meet the final 2012 deadline set by the CWC for destruction. To break the logjam, the G-8 and other countries should take the following steps:

1. The Global Partnership should drastically increase funding for CW demilitarization.

Perhaps the most pressing problem with Russia's CW demilitarization program is the lack of funding. Up to $6 billion, or perhaps even more, may eventually be required. With Moscow now asking for several hundreds of millions of dollars in next year's Russian budget, countries contributing to the Global Partnership should also step up their assistance. Ongoing efforts suggest a natural division of labor. For example, the United States should fully fund the Shchuch'ye facility, including a second stage expansion that would allow the destruction to proceed more quickly. That could require additional U.S. expenditures in the hundreds of millions of dollars beyond the $900 million already planned. The other large-scale destruction facility, to be built at Kambarka, should be funded by European countries since it is based on a prototype facility at Gorny already financed by Germany and, in the final phase, to a smaller extent by the EU and the Netherlands. Once again, the cost could run into hundreds of millions of dollars. Russia and the other contributors should all participate in funding infrastructure projects such as utilities needed to support these new facilities. As for the substantial cost of transporting CW to these destruction facilities, including the cost of secure railcars and upgraded railroads, new burden-sharing arrangements could be worked out between Russia and contributors on the basis of who could provide certain assets and services most efficiently. International financial institutions, such as the World Bank, could become a source of funding for CW destruction-related programs. Russia, with the support of all partners, should engage in public outreach activities to educate and reassure local populations about the technologies used for destruction, any potential human or environmental threats, emergency procedures, and other aspects of CW destruction that have evoked negative public reactions in the past.

2. Ensure the security of CW stocks awaiting destruction.

Under the best of circumstances, destruction of Russia's CW stocks will take a decade. For those sites where easily portable weapons are stored, near-term security upgrades are essential to preventing theft or diversion. The United States already has the funding to carry out security upgrades at Shchuch'ye if waiver problems are resolved. Other facilities where other contributors are active also require security upgrades, which would be natural extensions of existing assistance efforts.

3. The Bush administration should seek a permanent waiver of restrictions on CW funding.

Legislatively mandated restrictions on U.S. funding owing to unresolved concerns that Russia has not declared its entire stockpile, as required by the CWC, have brought the U.S. program to build the critical Shchuch'ye destruction facility to the brink of collapse. A presidential waiver would allow key assistance programs to move forward. Although Washington will presumably continue to pursue the issue of whether Russia has undeclared stocks through talks with Moscow, the urgency of proceeding with CW destruction in Russia argues for de-linking the two goals.

Fostering Solutions Sustainable by Russia

Threat reduction assistance was never intended to be permanent. With the improving political and economic outlook in Russia and the strides programs have made in the past decade, the contributing states should now take steps that will allow them to consider selectively reducing assistance programs at the end of the next decade. That means that the consolidation and downsizing of the WMD infrastructure will have to be accomplished in a way that does not increase the risk of proliferation. Russia must also be capable of maintaining a high level of security at remaining WMD facilities once outside assistance is reduced. Just as urgently, effective and durable threat reduction practices must be adopted in neighboring states.

1. Support commercialization and downsizing through expansion of existing programs.

The United States and Europe already have in place programs that aim to reduce the spread of dangerous WMD knowledge to certain states and substate actors. The International Science and Technology Centers focus on civilian scientific and technological cooperation projects with former weapon scientists and workers. The EU's TACIS program and the International Association for the Promotion of Cooperation with Scientists from the New Independent States of the Former Soviet Union (INTAS) foster economic and technological cooperation with Russian enterprises and facilities and train Russian scientists in management and marketing. A number of European governments support technology cooperation projects on a national basis. For many Europeans, rather than seeking to commercialize new products developed in the nuclear cities (which could involve large capital investments and substantial effort to transport goods from those isolated cities to world markets), the preference is to put highly skilled scientists and technicians to work providing scientific consulting services, either for Russian use or internationally (e.g., involvement in basic research such as occurs at the European Organization for Nuclear Research).

The U.S. Initiative for Proliferation Prevention (IPP), which works to commercialize already completed research and development, has made important progress in recent years, creating 700 sustainable jobs—a figure that should grow to 2,000 in the next two years. Revenue from commercialized ventures, which has reached $21 million, is projected to continue growing. Yet the program's current funding of $24 million is clearly inadequate to meet the growing demand from industry for government seed money. New funds will attract increasing amounts of money from private sources, including banks and venture capital firms. (In 2001, U.S. companies participating in this program received venture capital for the first time, amounting to $56 million). In addition to expanding and broadening the IPP program, consideration should be given to establishing comparable programs in Europe and eventually forming a single, multinational organization to promote commercialization that could work closely with the ISTC.

2. Create sustainable sources of revenue.

The United States should create a fund that requires companies profiting from the IPP program to either pay back the government for its seed money or provide the fund with equity in their "products." For example, if the IPP used $1 million of government money for a project that eventually generated $50 million in revenues, the company would either pay back the $1 million or a certain percentage of the profit. This fund might be privatized, cutting back on government bureaucracy and speeding up the cumbersome approval process. The Israel-U.S. Binational Industrial Research and Development Foundation, established to encourage cooperation between U.S. and Israeli high-tech industries, could serve as a model. It receives repayment only from successful projects.

3. Bolster Russian business interest in the Global Partnership.

A growing number of major entrepreneurs in Russia, together with their counterparts in the United States, Europe, Canada, and Japan, have recognized that they have a common interest in reducing the risks of terrorist attacks or WMD proliferation. They should be encouraged to work together to reduce those risks. In this connection, a U.S. industry coalition working with the IPP program has fostered the creation of a similar Russian industrial coalition—the National Industry Coalition of Russia—to encourage commercial high-tech ventures and to promote Russian investment in Russia in cooperation with U.S. partners. Such a coalition could provide a source of capital and political support for threat reduction activities in Russia and could facilitate cooperation with the United States and other partners—through providing business training, for example.

4. Pursue an initiative to assist Russia and others in the retirement, retraining, and resettlement of WMD personnel through financial and other assistance.

Assisting Russia, Ukraine, and others with the retirement of WMD workers represents a straightforward, affordable option for sustainable downsizing. Moscow already has extensive plans to cut back its WMD workforce, particularly personnel employed by the Ministry of Atomic Energy, as well as uniformed members of the Strategic Rocket Forces and the 12th Main Directorate, responsible for nuclear weapons security during storage and transport. By 2005, about 20 percent of Russia's nuclear weapons–related workers will be at or near retirement age. Of those 13,000 workers, about 10,000 can be expected to retire with the proper financial arrangements in place. The cost may be manageable; one study has estimated that 10,000 Russian workers could retire with a small additional annual supplement to their existing retirement plan at a cost of $50 million.

Retraining of workers, while much more complicated, would also be another useful instrument in fostering sustainable downsizing, either as a process that would take place naturally as private jobs are created or through the creation of more "public value" jobs (e.g., energy technology or public health) not strictly dependent on commercial developments. Additional initiatives need to focus on providing English-language skills for scientists who have to interact with the West to develop business contacts and business management and marketing training.

The Russian government should take steps to make it attractive for Russian businesses to hire former weapons scientists and workers and to make investments that would help create jobs for them. For example, Russian companies that hire someone from one of the closed nuclear cities might receive a tax credit.

Partner countries should also do more to address the social consequences of threat reduction activities (e.g., housing, resettlement costs, retraining and retirement programs). In the past, certain European governments have committed substantial resources in this area (e.g., German financial support for housing Russian forces repatriated from the GDR). In addressing these social needs, it is important to focus not only on former weapons scientists but also on specialized military personnel whose experience handling and operating WMD systems would be of substantial value to terrorists and states of proliferation concern.

5. Provide limited immigration opportunities for former Soviet weapons scientists.

The U.S. Soviet Scientists Immigration Act of 1992 was designed to absorb weapons scientists and specialists from the former Soviet Union—who potentially held WMD expertise—through the provision of temporary and permanent visas and immigration. The recent renewal of this act by the United States could be followed by similar immigration legislation in nations who share this concern. It would be an opportunity to combine national security concerns with the economic demand for scientific expertise.

6. Prepare Russia to maintain security at WMD facilities once assistance is reduced.

The United States, Euratom, and others have already begun this effort through assisting in the development of an indigenous Russian infrastructure for designing, producing, operating, and maintaining equipment needed to safeguard these facilities. Extensive training has also been provided to develop a cadre of Russian experts on nuclear security and accounting. For example, the Moscow Engineering Physics Institute has begun to train specialists for a degree in the field of materials protection, control, and accounting. The Ministry of Education has also approved a new field of study for higher education on nonproliferation and nuclear materials security. A textbook was developed and published in Russia with the support of European countries.

Nevertheless, there remains a need for significant investment in the further development of a cadre of Russian experts. The nonproliferation education of the younger generation in Russia—including but not limited to researchers, scientists, engineers, diplomats, parliamentarians and government officials, the military, and customs officers—should be a high priority. Contributors can help foster this effort by providing financial and technical support to the growing number of programs in Russia designed to train those experts as well as by funding opportunities for Russians to train at European graduate and technical schools. Cooperation among Euratom, the Nuclear Regulatory Commission, and Russian organizations might also be expanded.

Although the promotion of nonproliferation education is extremely important, at the end of the day, sustaining high levels of security will depend on the availability of Russian funds for that purpose. In this context, perhaps one long-term objective of a Russian Nonproliferation Fund (which could be based largely on proceeds from debt-for-nonproliferation exchanges) would be to establish a permanent "endowment" that would help finance these activities.

Finally, indigenously produced equipment and well-trained experts will not be enough to guarantee security at sensitive Russian sites after foreign assistance is phased out. Another critical element will be incentives. The Russian government must create an incentive structure of benefits and penalties that will motivate facility managers to devote the necessary resources and attention to maintaining high standards of security at their installations.

Bolstering National Export Controls and Border Security

The improvement and effective enforcement of export controls by Russia and neighboring governments is increasingly recognized as an important supply-side contribution to threat reduction. But export control assistance, especially to Russia, has been negligible so far compared to the scale of the overall problem and the serious gaps in operating its national export control system. Given the considerable progress Russia has made in recent years in enhancing the legal and regulatory basis of its export control system, nonproliferation assistance efforts should now focus heavily on enforcement of existing laws and regulations. In the last analysis, however, the overall effectiveness of Russian export controls will largely depend on the Russian leadership's political commitments to adhere to nonproliferation values and practices in deed as well as in word.

But addressing deficiencies in Russia will not be enough. It will also be necessary to provide export control and border security assistance to neighboring NIS republics that may otherwise become dangerous transshipment routes, given their porous borders with Russia and the free flow of goods and services as a result of multilateral arrangements that have minimized trade restrictions within the NIS. Global Partnership contributors should work together with NIS countries, especially in Central Asia and the Caucasus, on a strategic plan that identifies priority countries and needs, develops a set of best practices, and establishes a division of labor for assisting NIS countries to meet those standards.

1. **Provide more detection equipment to customs services and border guards and train their personnel.**

The latest estimate is that only 45 percent of Russia's customs checkpoints have operable radiation detectors and monitors. Accelerated delivery of these instruments and support for customs analytical labs must be given higher priority. To promote both operability and long-term sustainability, radiation detection equipment should be manufactured in Russia, as has been the case under the U.S. Second Line of Defense Program. In addition to radiation detectors, imaging equipment

(x-ray or gamma ray) and other general detection equipment is urgently required, as is assistance to enforcement agencies in Russia and elsewhere in the former Soviet Union to enable their employees to communicate more effectively between far-flung border points, regional centers, and headquarters, and with each other. There is also a need to provide more support to customs and border guard training institutions in order to modernize and diversify their curriculums and to improve the ability of customs officials to recognize dual-use goods that can be used to manufacture WMD. The creation of a region-wide training center should be considered.

2. Expand assistance in improving internal compliance mechanisms and information sharing within private enterprises.

Weaknesses in the government-operated export control system make it imperative to expand ongoing assistance to private enterprises to help them establish internal export control mechanisms and procedures and improve the professional skills of the personnel responsible for ensuring that the enterprises comply with export control laws and regulations. In this connection, partner nations should join the U.S. Departments of Commerce and Energy in expanding regional export control seminars for Russia's exporters, which have already reached more than 500 Russian enterprises, and turn them into multilateral projects.

Another way to strengthen and promote these internal compliance mechanisms would be to facilitate the introduction of export control courses at Russia's technical universities, which could enable university graduates to assume part-time or full-time positions as internal-compliance officers at their future places of work. Western investors could also be encouraged to promote, where appropriate, export control awareness and culture in dealings with their partners in Russia and the other NIS.

3. Engage Russia in developing policy tools to control intangible transfers of proliferation sensitive information.

Today, enormous quantities of data with the potential to contribute to WMD programs can be exchanged instantaneously via fax, e-mail, and other electronic means with every corner of the world. As Russia joins the information technology revolution and continues to restructure its higher educational institutions, these "intangible transfers" risk becoming a major export control loophole. Former weapons scientists working under contract to foreign entities, or foreign students receiving training in technical fields in Russian universities, can electronically transfer proliferation-sensitive information to foreign governments or subnational groups. Although Russia has incorporated controls on intangible transfers into its export control laws, much work is needed to promote compliance on the part of industry and academia. Russia is hardly alone in needing to focus on this relatively new challenge. Other G-8 countries also have far to go in finding practical answers. They need to work together in a spirit of partnership, perhaps by convening a forum where Russian officials, as well as industry and academic leaders, can explore solutions with their G-8 counterparts.

4. Facilitate the introduction and operation of an automatic licensing system.

This online system would accelerate the consideration of license applications and make the entire process more transparent. Its introduction would make it easier for Russia to keep track of export transactions, share relevant information with international regime partners, and reduce red tape and corruption.

About the Partners

Canada

The Centre for Security and Defence Studies (CSDS) at the Norman Paterson School of International Affairs (NPSIA), Carleton University, promotes and integrates teaching, research, and public outreach in security and defense studies, including conflict management and resolution. Based in Ottawa, CSDS organizes conferences, workshops, consultative, meetings and guest lectures, among its other activities. It maintains close ties with similar research institutes, and with the defense policy community, in Canada and abroad. For more information, please visit <www.carleton.ca/npsia/new_npsia/research_centres/csds.html>.

European Union

The European Union Institute for Security Studies (EU-ISS) was created on July 20, 2001, as an autonomous agency under the EU's second pillar, the Common Foreign and Security Policy (CFSP). Having autonomous status and intellectual freedom, the EU-ISS neither represents nor defends any particular national interest. Its aim is to help create a common European security culture through enriching strategic debate and systematically promoting EU interests on major security and defense issues, providing forward-looking analysis for the union's council and high representative, and developing transatlantic dialogue on shared security issues among Europe, Canada, and the United States. For more information please visit, <www.iss-eu.org>.

France

The Fondation pour la Recherche Stratégique (FRS)—Foundation for Strategic Research—is an independent French think tank devoted to the study and analysis of international security issues. Its staff of about 35 includes experts on terrorism, proliferation, space, regional issues, military operations and technologies, and defense industries. FRS clients include French institutions and government agencies, as well as private companies. FRS is headed by Bruno Racine (chairman of the board) and François Heisbourg (director). For more information, please visit <www.frstrategie.org>.

Germany

Stiftung Wissenschaft und Politik (SWP)—German Institute for International and Security Affairs—is an independent research center that advises the German parliament and the German federal government on all matters relevant to German foreign and security policy. Since its establishment in 1962 in Ebenhausen near Munich, it has developed into the largest research institute of its kind in West-

ern Europe. In April 1998, Christoph Bertram became director of the institute, which moved to Berlin in January 2001. For more information, please visit <www.swp-berlin.org>.

International

The International Institute for Strategic Studies (IISS), founded in 1958, is a private not-for-profit organization for the study of political risk, international relations, military strategy, arms control, regional security, and conflict resolution. The council and staff of the institute are international, and its membership, both individual and corporate, extends to more than 100 countries. The IISS is independent, and it alone decides what activities to conduct. It owes no allegiance to any government or to any political or other organization. The IISS stresses rigorous and forward-looking research, placing particular emphasis on bringing new perspectives to the strategic debate. For more information, please visit <www.iiss.org>.

International

The Stockholm International Peace Research Institute (SIPRI) is an independent international research organization that studies problems of peace and conflict, especially those of arms control and disarmament. It was established in 1966 to commemorate Sweden's 150 years of unbroken peace. The staff and the governing board of the institute, which is financed mainly by the Swedish Parliament, are international. The institute offers a unique platform for researchers from different countries and different disciplines to work in close cooperation on projects. The results of the research are disseminated through the publication of books and reports by SIPRI as well as through symposia and seminars. For more information, please visit <www.sipri.org>.

Italy

The Landau Network–Centro Volta, Como, Italy, is a worldwide, nonprofit, nongovernmental organization, which has helped to implement international agreements for scientific cooperation with Russia and others, collaborated to define and activate multilateral agreements, including the European Nuclear Cities Initiative (ENCI). It has become a consulting center for the Italian Foreign Office on global issues concerning disarmament, nonproliferation, international security, and environmental problems such as energy/water security. Union Scienziati Per Il Disarmo (USPID) is an association of scientists established in 1982 with the purpose of providing information and analyses on various aspects of arms control and disarmament. For more information, please visit <lxmi.mi.infn.it/~landnet> and <www.uspid.dsi.unimi.it>.

Japan

The Japan Institute of International Affairs (JIIA) is a private, nonprofit, and independent research organization founded in 1959. Since its founding, JIIA has organized study groups on various regional and global issues relevant to the formulation of Japan's foreign policy, as well as international conferences, sympo-

siums, and seminars in order to foster dialogue and exchange of opinions with overseas counterparts. It has also conducts joint research projects with other research organizations and with universities, both domestic and overseas. As a result of these activities, JIIA issues a wide range of publications. For more information, please visit <www.jiia.or.jp>.

Netherlands

The objective of the Netherlands Institute of International Relations "Clingendael" is to promote the understanding of international affairs. Clingendael seeks to achieve its objective by means of research, the publication of studies, the organization of courses and training programs, and the provision of information. It acts in an advisory capacity to the government, parliament, and social organizations; organizes conferences and meetings; maintains a library and documentation center; and publishes a monthly journal. As an international institute, Clingendael maintains regular contacts with other major research institutes throughout Europe and the United States and, together with similar institutes in Western Europe, prepares studies for the European Commission. For more information, please visit <www.clingendael.nl>.

Norway

With more than 40 years of experience, the Norwegian Institute of International Affairs (NUPI) is the leading Norwegian institute on research and information on international security issues. The institute is based in Oslo and has an independent position in studying a wide range of matters of relevance to Norwegian foreign policy and economic relations. For more information, please visit <www.nupi.no>.

Russian Federation

The Institute of World Economy and International Relations (IMEMO) is one of the most prestigious nonprofit centers in Russia for fundamental and applied socioeconomic, political, and security studies. Established in 1956, under the charter of the Russian Academy of Sciences, IMEMO conducts research on contemporary global problems, analyses and forecasts of world economic trends and socioeconomic development, economic theory, international relations, regional developments, security studies, disarmament, and conflict resolution. The institute's research is combined with active participation in public discussion and deep involvement in the transformation processes in Russia, particularly through providing advice for domestic and international decisionmaking and expert communities. For more information, please visit <www.imemo.ru>.

Russian Federation

The PIR Center for Policy Studies in Russia is a nonprofit, independent, Moscow-based research and public education organization, which was founded in April 1994. Although its name and flexible structure permit it to conduct research on a wide range of issues related to Russian foreign and domestic policy, the center is

currently focused on international security, arms control, and nonproliferation issues directly related to Russia's internal situation. It is considered to be the leading Russian nongovernmental organization working in this area. For more information, please visit <www.pircenter.org>.

Sweden

The Swedish Institute of International Affairs is an independent public service institution charged with the task of providing information on international relations and conducting advanced research on international security issues. The long-term research programs include studies of Western European security cooperation, Russian national security strategies, and human rights. The special foreign and security program is focusing on Swedish foreign policy, EU questions, regional security arrangements and regimes, global trade, and finance issues. The institute also offers lectures and seminars open to the general public and organizes a number of international conferences each year. For more information, please visit <www.ui.se>.

United Kingdom

The Centre for Defence Studies (CDS) was established at King's College London in 1990 and is now a key component of the International Policy Institute (IPI) at King's College London. The primary mission of the CDS is to engage in research on British, European, and international defense and security issues; promote interdisciplinary approaches to policy research; effectively distribute this research and expertise; work constructively with governments and international organizations; and maintain a high public profile through media interaction. Principal research areas include UK defense policy, European defense and security, defense management and organization, regional and new security challenges. For more information, please visit <www.kcl.ac.uk>.

United States

For four decades, the Center for Strategic and International Studies (CSIS) has been dedicated to providing world leaders with strategic insights on—and policy solutions to—current and emerging global issues. CSIS is led by John Hamre, former U.S. deputy secretary of defense, and is guided by a board of trustees chaired by former U.S. senator Sam Nunn. CSIS addresses the full spectrum of new challenges to national and international security. CSIS also maintains resident experts on all of the world's major geographical regions and is committed to helping to develop new methods of governance for the global age. For more information, please visit <www.csis.org>.