

OUR OWN WORST ENEMY?

Institutional Interests and the Proliferation
of Nuclear Weapons Expertise



SHARON K. WEINER

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Sharon K. Weiner

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For Frank and Patricia von Hippel

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List of Acronyms

AIDCO	American Industrial Development Corporation
BEP	Biosecurity Engagement Program
BII	BioIndustry Initiative
BISNIS	Business Information Service for the Newly Independent States
BTRP	Biological Threat Reduction Program
BW	Biological Weapon
CEES	Center for Energy and Environmental Studies, Princeton University
CISAC	Center for International Security and Cooperation, Stanford University
CNCP	Closed Nuclear Cities Partnership
CRADA	Cooperative Research and Development Agreement
CRDF	Civilian Research and Development Foundation
CTR	Cooperative Threat Reduction
CW	Chemical Weapon
DCAA	Defense Contract Audit Agency
DEF	Defense Enterprise Fund
DNA	Defense Nuclear Agency
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DSTO	Database on Nuclear Smuggling, Theft, and Orphan Radiation Sources, Stanford University
DSWA	Defense Special Weapons Agency
DTRA	Defense Threat Reduction Agency

EBRD	European Bank for Reconstruction and Development
EML	Environmental Monitoring Lab
ETRI	Expanded Threat Reduction Initiative
EXBS	Export Control and Border Security
FDI	Foreign Direct Investment
FSA	Freedom Support Act
FSB	Federal Security Service, Russia
FTE	Full Time Equivalent
GAO	U.S. Government Accountability Office (formerly U.S. General Accounting Office)
GIPP	Global Initiatives for Proliferation Prevention
GosNIAS	State Research Institute for Aviation Systems
GosNIIOKhT	State Union Scientific Research Institute of Organic Chemistry and Technology, Moscow
HEU	Highly-Enriched Uranium
IAEA	International Atomic Energy Agency
IDC	International Development Centers
ILAB	Inter-Laboratory Advisory Board
IMEMO	Institute of World Economy and International Relations
INTAS	International Association for the Promotion of Cooperation with Scientists from the New Independent States of the Former Soviet Union
IPP	Industrial Partnering Program
ISO	International Organization for Standardization
ISTC	International Science and Technology Center
LEU	Low-Enriched Uranium
MOD	Ministry of Defense, Russia
MPC&A	Material Protection, Control, and Accounting
MPTI	Moscow Physical Technical Institute
NADR	Nonproliferation, Anti-Terrorism, Demining and Related issues account, U.S. Department of State
NAS	National Academies of Science
NCI	Nuclear Cities Initiative
NII IS	Institute of Measurement Systems, Nizhny Novgorod
NNSA	National Nuclear Security Administration
NSC	U.S. National Security Council

NTI	Nuclear Threat Initiative
NWMDE	Nonproliferation of Weapons of Mass Destruction Expertise, U.S. Department of State
OPIC	Overseas Private Investment Corporation
PI	Principal Investigator
POO	Purity of Objective factor
RANSAC	Russian-American Nuclear Security Advisory Council
RTI	Russian Transition Initiatives
SABIT	Special American Business Internship Training Program
STCU	Science and Technology Center in Ukraine
TACIS	Technical Aid to the Commonwealth of Independent States
TDA	U.S. Trade and Development Agency
USAID	U.S. Agency for International Development
USIC	United States Industry Coalition
VNIIA	Institute of Automatics, Moscow
VNIIEF	All-Russian Research Institute of Experimental Physics, Sarov
VNII IT	Institute of Impulse Technologies, Moscow
VNII TF	All-Russian Research Institute of Technical Physics, Snezhinsk
WMD	Weapons of Mass Destruction
ZATO	Closed Administrative Territory

Our Own Worst Enemy?

Chapter 1

Controlling the Proliferation of Nuclear Knowledge

An Introduction

In October of 1996, Vladimir Nechai committed suicide. His death was newsworthy, but not because of the means; suicide was not so unusual in Russia, largely due to the widespread financial deprivation in the years following the collapse of the Soviet Union. Nechai's act was reported by the Western news media because of his position as director of one of the Soviet Union's premier nuclear weapons research and design facilities. According to the note he left behind, Nechai took his own life partially out of shame. Much of the research at his institute had been suspended indefinitely for lack of funds, and the people who worked there had not been paid in five months. Even when salaries were delivered, they left people in near-poverty conditions, with the average member of Nechai's nuclear weapons workforce making about \$30 a month.¹

The situation in other parts of the former Soviet nuclear weapons complex was no better. There were strikes in some facilities, with thousands of workers demanding back wages and higher pay. Some nuclear weapons scientists made the journey to Moscow to protest directly to the federal government. In other areas, institute directors reported critical shortages of medical supplies and other necessities.

The Russian government was well aware of the grim conditions across the vast complex of nuclear, biological, and chemical weapons facilities that had been created in the Soviet Union. But it had been struggling with even bigger economic and political problems, and felt powerless to help these scientists.

The U.S. government also knew of the financial problems in the states of the former Soviet Union and was particularly concerned about what was happening in the weapons facilities. Based on the assumption that a financially desperate weapons scientist is a proliferation risk, the U.S. government had engaged the Departments of Defense, Energy, and State in trying to create alternative jobs or provide temporary research contracts to former Soviet experts in weapons of mass destruction (WMD). By the time of Nechai's death in 1996, these efforts were several years old.

1. Unless otherwise specified, all figures cited are in U.S. dollars.

Since the breakup of the Soviet Union, the danger of the proliferation of WMD knowledge has been a persistent theme in U.S. policy. Anecdotes have surfaced about former Soviet weapons experts helping Iran, Iraq, and North Korea with their nuclear programs. A Senate staffer claims to have obtained a flyer from China advertising “detailed files of hundreds of former Soviet Union experts in the field of rocket, missile, and nuclear weapons. These weapons experts are willing to work in a country which needs their skills and can offer reasonable pay.”² Subsequent polls showed that many Russian WMD experts were willing to work on military programs for other countries, including places such as North Korea, Syria, Iran, or Iraq.

On September 11, 2001, the attacks on the United States brought these fears closer to home. Besides concerns about possible terrorist use of nuclear weapons against the United States, the subsequent anthrax-tainted letters extended this anxiety to include biological weapons. In the 2004 presidential election, George W. Bush and John Kerry may have agreed on little else except the danger posed by nuclear proliferation: both candidates claimed it was the primary security threat facing the United States. Four years later, this agreement still held for the 2008 Democratic and Republican presidential hopefuls. Newly elected president Barack Obama declared in April 2009 that nuclear terrorism was “the most immediate and extreme threat to global security,” and pledged that the United States would lead the way in securing all vulnerable nuclear materials within four years.³ Over time, candidates, politicians, and pundits from both parties have also shared one other commonality: a belief that one of the most likely sources of the materials and expertise needed to make WMD is the former Soviet Union.

From the collapse of the Soviet Union in 1991 through 2008, the United States spent over \$1.2 billion trying to discourage the proliferation of nuclear, biological, and chemical weapons expertise from Soviet successor states.⁴ Some of this money funded short-term research contracts intended to provide scientists with much-needed income while keeping them engaged in interesting work. Other funds went toward a more long-term solution: creating permanent non-weapons jobs or converting entire institutes to civilian occupations. In the process, this effort spawned a dialogue that led to unprecedented cooperation and a level of commitment from some quarters that was and remains nothing short of extraordinary. As the Obama administration assumed office, there was every indication

2. U.S. Congress, Senate, Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction*, Part II, 104th Cong., 2nd sess., March 13, 20, 22, 1996, pp. 7, 139.

3. Office of the Press Secretary, White House, “Remarks by President Barack Obama,” Prague, April 5, 2009, http://whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/.

4. This includes annual spending through 2008 for the major programs in the Departments of Defense, Energy, and State. In the late 1990s, both State and Defense started additional efforts aimed at biological weapons experts. Collectively, these would add over \$300 million more to this total.

that these “knowledge nonproliferation” efforts—that is, programs aimed at fighting the proliferation of weapons expertise—would be sustained and probably expanded.

Given the importance of this agenda and the commitment of those involved, it comes as a surprise that these efforts enjoyed only mixed success. Although temporary salaries were provided for thousands of former Soviet WMD experts, few job creation or conversion efforts succeeded. Moreover, despite continued concerns about proliferation, the pace and political impetus given to this effort lagged after the 1990s, and as the second Bush administration drew to a close, the United States was poised to end its cooperative nonproliferation work with Russia in favor of expanding to other countries beyond the former Soviet states. Yet much work remained undone.

This book chronicles the design, implementation, and evolution of four U.S. programs, each of which was aimed at countering the threat of proliferation of WMD expertise from the former Soviet Union by creating jobs for these weapons workers. These programs are examined from their origins at the end of the Cold War, through three different U.S. presidential administrations, various changes in U.S.-Russian relations, Russia’s partial and, as of 2008, likely temporary, economic recovery, up until the advent of the Obama administration. The book also situates each of these programs within three important narratives: one describes the state of the former Soviet WMD complex and how the threat of proliferation changed over time; another illustrates the often-contentious domestic political debate within the United States over how to respond to the collapse of the Soviet Union; and the third juxtaposes the institutional interests and dynamics of three different government departments with the common task they were given.

The result, I argue, supports three broad conclusions. The first, as mentioned above, is that U.S. programs did not succeed at redirecting or converting significant parts of the former Soviet WMD complex. They did not achieve this goal despite general and persistent agreement about its importance, unprecedented cooperation between the United States and Russia, and the tremendous personal and in many cases institutional dedication of parts of the U.S. Departments of Defense, Energy, and State, which were given this assignment. This commitment was duplicated within parts of the Russian WMD complex, where key individuals took a brave stance in favor of such cooperation and then did their best to challenge institutional, political, and cultural obstacles. If importance, hard work, and perseverance were the only criteria, these programs would have succeeded years ago.

The second conclusion is that despite the poor overall results at conversion and job creation, there were two important successes. One is that during critical periods, some former Soviet nuclear, biological, and chemical weapons scientists had an income only or mostly due to U.S. funding. During the early 1990s, when economic conditions were the most dismal, the United States provided WMD experts with salaries through short-term research contracts. For some institutes, this meant the

difference between life and death. The other success is that these programs, and the larger Cooperative Threat Reduction (CTR) effort to which they are related, forced the United States to work more closely with the Soviet successor states, and especially Russia, than U.S. political leaders would have chosen to do otherwise. This meant a closer relationship between former Cold War enemies that has been extremely important to U.S. national security, even though by 2002–2003 it had begun to show strong signs of fatigue and wear.

The third conclusion is about why these programs did not accomplish more. Many experts attribute this deficiency to externally imposed constraints, such as insufficient budgets, a lack of high-level coordination within the U.S. government, or uncooperative external actors—usually Russia. Although these impediments are real, I argue that they are insufficient to explain failure. Instead, I place the blame on two enduring features of the U.S. policy process: democracy and bureaucratic institutions.

In the case of WMD expertise from the former Soviet Union, democracy hindered U.S. counterproliferation efforts because the debate over how to respond to the collapse of the Soviet Union was never resolved. In 1990, policymakers argued about whether helping Russia secure, downsize, or destroy its WMD assets was in the national security interest of the United States or more properly considered as charity to a former enemy. Although Congress officially came down on the side of “cooperative security” when it funded the CTR program in 1991, each subsequent reauthorization of program authority or funding was subjected to complaints that such money helped Russia’s own weapons effort, was wasted, would be better spent at home, or some combination of all of these. Occasionally, critics succeeded in getting Congress to apply conditions to U.S. spending. Usually, these conditions made it harder for programs to achieve the nonproliferation task they were given. Always, the threat of future conditions or funding restrictions was on the mind of program personnel, and it influenced how they defined goals, implemented programs, and learned from experience. Although this unresolved debate influenced CTR overall, it was especially important to programs aimed at the proliferation of WMD expertise because these were often considered the most peripheral—and therefore expendable—part of the CTR agenda. In particular, my case studies show that two of the four knowledge nonproliferation programs funded by the United States were significantly, and negatively, influenced by this disagreement over whether they were part of U.S. defense spending or, instead, foreign aid.

Part of this narrative about U.S. domestic politics also includes the presidency. With the exception of a few years during Clinton’s first term in office, knowledge nonproliferation programs claimed little presidential attention. Under the administration of George W. Bush, they were at times subjected to not-so-benign neglect. Repeated calls for increased attention from the executive, or a designated “czar,” went unheeded. The result was ineffective advocacy with Congress and the public, a lack of inter-program coordination, and a dialogue with Russia that lacked the political clout to solve persistent problems.

Although the consequences of this U.S. domestic political context have been important, in the pages that follow, I argue that bureaucratic institutions, and especially their interests and cultures, have been the bigger problem. Even more strongly, I argue that had Russia cooperated fully, Congress significantly increased spending, and the “security versus charity” debate been resolved, the United States would still have lagged behind in its efforts to create alternative jobs for Soviet WMD experts. This is because each of the three bureaucracies that were given this task defined it, implemented solutions, and measured success in ways that satisfied their own needs rather than the requirements for creating jobs for former Soviet WMD experts. For very different reasons, the Departments of Defense, Energy, and State all became victim to the same pathology: they let institutional interests replace U.S. national security needs.

Such substitution should come as no surprise. The literature on national security, the policy process, and most specific policy areas are all replete with illustrations of the power of institutional interest.⁵ In this book I do more than provide another example. I directly compare explanations based on the presumption of rational decision-making with those whose explanatory power is rooted in the history, internal politics, and sense of mission of institutions. Further, I show how institutional interests, external constraints, and past legacies in three very different organizations—the Departments of Defense, Energy, and State—all led to similar results, and how the power of institutional interests and needs was reinforced by the domestic political debate within which these programs functioned. Moreover, I argue that these results could have been anticipated and mitigated, although not eliminated. For this reason, I claim that in the U.S. fight to stem the proliferation of WMD knowledge from the former Soviet Union, we were our own worst enemy.

Three Departments, Four Programs, and a Bunch of Acronyms

This book looks at the evolution and success of U.S. efforts to counter knowledge proliferation from the Soviet nuclear weapons complex during the period of 1990–2008. Most succinctly phrased, this involves ISTC, STCU, NCI, and IPP (which together were RTI and then later GIPP), and a defunct set of defense conversion efforts in the Defense Department that initially managed to avoid being known by an acronym but later became DEF. These programs were housed in the Departments of Defense, Energy,

5. I use the terms “organization” and “institution” interchangeably. The literature that focuses on organizational interests tends to assume organizations have a stable set of interests that arise from their sense of mission and are pursued through instrumentally rational processes. Institutionalism and new institutionalism, on the other hand, focus on the dynamics of preference development and change in institutions, arguing that interests arise from past history, experience, environment, and the preferences of personnel and that these, in turn, both influence goals and processes and are influenced by them. Although I make use of the dynamics of the new institutionalist approach, I use organization and institution as synonyms for stylistic reasons and because my work seeks to explain the outcome of a particular policy decision rather than expand upon new institutionalism per se.

and State and collectively formed a small part of what is known as CTR, or Cooperative Threat Reduction. Rephrasing this without acronyms requires a bit less brevity.⁶

During the 1990s, the U.S. government created four main programs to deal with the threat of the proliferation of nuclear, biological, and chemical weapons knowledge from the former Soviet Union. The first program, which was located in the U.S. Department of Defense, was an effort to convert WMD-related defense institutes in Russia, Ukraine, Belarus, and Kazakhstan by partnering spin-offs from these institutes with U.S. business partners. This program, which to my knowledge never received a formal title or acronym, will be referred to as the Defense Conversion program.⁷ In the mid-1990s, the Defense Conversion program was terminated by Congress, and the Defense Department's efforts to deal with the proliferation of expertise continued as the Defense Enterprise Fund, or DEF.⁸ DEF was an investment fund that provided loans and grants to cooperative business ventures between U.S. companies and spin-offs from former Soviet defense enterprises. Because of mismanagement, it was closed in 2003.

The second program comprised the Science Centers, of which there were two: the International Science and Technology Center (ISTC), based in Moscow, and the Science and Technology Center Ukraine (STCU), in Kiev. These centers were multinational clearinghouses for research cooperation among weapons experts in the states of the former Soviet Union and the United States, the European Union, Canada, South Korea, Japan, and Norway. Each center operated on a similar but independent basis, and U.S. participation in both was managed by the State Department. Each center funded collaborative research between Western scientists and former Soviet nuclear, biological, and chemical weapons scientists as well as missile experts. This collaboration took two forms. One involved short-term work with the intent of completing a given research project. The second involved collaboration aimed at validating a technology or demonstrating a concept that might lead to additional cooperation or permanent reemployment away from the weapons complex. As of early 2009, the centers continued to fund both types of projects, and the center in Moscow was poised to expand its services to other countries.

6. Cooperative Threat Reduction, or CTR, was also referred to as "Nunn-Lugar" after its congressional sponsors. During the early 1990s, CTR tended to refer to programs managed by the Defense Department. As responsibility for some parts of CTR shifted to other departments, and specially the Department of Energy, CTR came to stand for a variety of efforts. By 2008, however, CTR was again the favored term for programs in the Defense Department, while those at the Departments of Energy and State were considered "threat reduction" or "nonproliferation assistance." See Amy F. Woolf, *Nonproliferation and Threat Reduction Assistance: U.S. Programs in the Former Soviet Union*, Congressional Research Service, February 11, 2009, p. 4.

7. In reports by one analyst, these conversion efforts are referred to as the Industrial Partnering Program, but this title does not seem to have caught on and creates confusion with IPP, which originally also was called the Industrial Partnering Program.

8. Initially, DEF stood for Demilitarization Enterprise Fund.

The third and fourth programs were both found in the Department of Energy, and took their project managers mainly from the U.S. national laboratory complex. Initiatives for Proliferation Prevention (IPP) dates from the early 1990s. IPP projects involved collaborative research between U.S. and former Soviet WMD scientists and a U.S. business partner. The goal was to reemploy the former Soviet scientists by getting a U.S. business interested in either their scientific skills or a technology they had pioneered. IPP-funded research was aimed at taking a technology or idea from conception to the marketplace.

The other DOE program, which began in 1998, was the Nuclear Cities Initiative (NCI). NCI focused on several “closed nuclear cities” in Russia which were the heart of the Soviet nuclear weapons complex. Originally, NCI’s mission was to reemploy weapons experts by encouraging business development in these cities, improving living standards and city infrastructure, and helping Russia reduce the size of its nuclear weapons complex by negotiating the conversion of specific facilities.

In 2002, IPP and NCI merged to form Russian Transition Initiatives (RTI), although both programs remained largely independent. In 2006, RTI’s name was changed to Global Initiatives for Proliferation Prevention (GIPP) to reflect programmatic activities beyond the states of the former Soviet Union. During this time, support for NCI waned, and as of September 2006, its activities had ended. By early 2009, IPP had become GIPP and expanded to include scientists in Iraq, Libya, and potentially also North Korea.

Other Nonproliferation Efforts

Although the Defense Conversion program, the Science Centers, IPP, and NCI were the main mechanisms the United States employed to counter the proliferation of WMD knowledge, from 1990 to 2008 there were a variety of other efforts aimed at redirecting or converting former Soviet WMD experts. Described below, these activities are not included here as objects for analysis because of their size or scope. Some are excluded because they were much smaller than the programs at Defense, Energy, and State and lacked significant resources to devote to fighting the proliferation of WMD expertise. Other programs are left out because they dealt only tangentially with the proliferation of expertise; their main missions focused elsewhere.

A trio of efforts aimed at biological weapons experts is not so much excluded as it is considered under the rubric of the Science Centers. In 1998, the Defense Department began the Biological Weapons Proliferation Program which was renamed the Biological Threat Reduction Program (BTRP) in 2007. As of 2008, BTRP was really four efforts, only one of which—the Cooperative Biodefense Research Program—was aimed at the proliferation of WMD expertise.⁹ Under this program, Defense funded

9. The other three parts focused on dismantling facilities that used to produce biological weapons, increasing safety and security at institutes that store and handle pathogens and potentially weapons-relevant materials, and developing surveillance and warning systems

short-term collaborative research between U.S. scientists and former biological weapons workers in Russia, Uzbekistan, Kazakhstan, and Georgia. The goal was to discourage proliferation by reorienting scientists toward non-weapons work, increase transparency with respect to both experts and their work at Russian institutes, and help improve U.S. defenses against biological weapons.¹⁰ By 2008, the program had spent some \$62 million on collaborative projects in the former Soviet Union.¹¹ In 2007, however, the Defense Department announced that it would end the program's work in Russia because of a combination of problems getting access to the biological weapons institutes where the research took place and the belief that the Russian government could now afford to sustain these institutes without U.S. assistance.¹²

Under the Biosecurity Engagement Program (BEP), the State Department also funded two efforts directed at former Soviet weapons experts. The Bio-Chem Redirect Program provided money to the U.S. Department of Health and Human Services, the Department of Agriculture, and the Environmental Protection Agency to collaborate in research projects with Soviet biological and chemical weapons experts. Projects focused on public health, environmental monitoring and rehabilitation, and livestock and plant issues, as well as defense against biological terrorism. The other program was the BioIndustry Initiative, or BII. Started in response to the September 11, 2001, terrorist attacks and subsequent anthrax-laced letters, through BII the State Department funded efforts by the Departments of Health and Human Services, Agriculture, and the Environmental Protection Agency to engage in collaborative research to develop vaccines for highly infectious diseases. In Russia, both programs were administered through ISTC.

Similar to the Defense Department, in 2007 the State Department announced that it would cut back its collaborative research projects in Russia. Citing the increased capabilities of the Russian government and economy, plus emerging public health concerns and terrorist threats, the State Department planned to redirect BEP toward cooperation with experts in South and Southeast Asia and the Middle East.¹³

for storage facilities.

10. Department of Defense, Defense Threat Reduction Agency, "Cooperative Threat Reduction Annual Report to Congress," fiscal year 2006, Washington, D.C., p. 53.

11. National Research Council, *The Biological Threat Reduction Program of the Department of Defense: From Foreign Assistance to Sustainable Partnerships* (Washington, D.C.: National Academy of Science, 2007), p. 37. For a list of specific projects, see Department of Defense, Defense Threat Reduction Agency, "CTR Annual Report to Congress," fiscal year 2007, Washington, D.C., pp. 35–37. Projects not located in Russia were administered through the U.S. National Academies of Science or the Civilian Research and Development Foundation (CRDF).

12. Yudhijit Bhattacharjee, "Rising Asian Threat Leaves Russia in the Lurch," *Science*, Vol. 317 (August 3, 2007), p. 581

13. *Ibid.*

Also excluded from my analysis is the Civilian Research and Development Foundation (CRDF).¹⁴ CRDF was created in 1995 by the National Science Foundation at the request of Congress and gets funding from the U.S. government, U.S.-based foundations, and a variety of private companies. Its purpose is to support the maintenance of a scientific infrastructure in post-Soviet countries by providing scientific and technical experts with opportunities for employment at home that uses their skills. CRDF's non-proliferation programs specifically targeted former Soviet WMD experts for conversion to non-weapons work. CRDF funded research collaborations and product validation and development, in addition to conferences, business training and networking, travel, and peer review of research proposals. Some collaboration was among scientists; most involved U.S. industry or government agencies. According to CRDF's 2005 annual report, during its first decade it funded research that involved over 25,000 scientists, of whom 2,500 were former weapons experts from Europe, Asia, the Middle East, and North Africa.¹⁵

CRDF played an important role in the collaborative research projects sponsored by the Defense and State departments and IPP. Because it had some tax-exempt privileges in former Soviet states, these programs often used CRDF to administer and oversee their cooperative research projects. CRDF managed the importation of any needed equipment and supplies, provided salary payments to former Soviet experts, and could also provide in-country project support and oversight. In return, U.S. government agencies paid a fee of around 10 percent to CRDF.¹⁶ As of 2008, CRDF continued to play a role in both IPP and Science Center projects, but also acted more broadly in funding scientific cooperation.

The Commerce Department had several programs to help U.S. businesses exploit opportunities in the former Soviet Union. Although these were not aimed specifically at WMD experts, a few were involved. The Special American Business Internship Training Program (SABIT) funded U.S.-based short-term internships for former Soviet entrepreneurs and offered courses in business development in Russia. The Business Information Service for the Newly Independent States (BISNIS) provided market and investment information about opportunities in former Soviet states, including some former defense and WMD enterprises. Commerce also maintained a directory of defense enterprises in the former Soviet Union that were interested in collaborative relationships with industry.

With a similar focus, the U.S. Trade and Development Agency (TDA) used U.S. funding to promote development projects in other countries in cooperation with U.S. businesses. As part of its business development efforts, TDA funded studies of defense conversion projects.

14. More information on CRDF can be found at www.crdf.org.

15. Civilian Research & Development Foundation, "2005 Annual Report," Arlington, Va., pp. 8, 20.

16. Electronic communication with CRDF, August 22, 2007.

The U.S. government also provided money to a variety of investment funds that helped businesses establish ventures in the former Soviet Union. From the perspective of WMD experts, the two most important ones were USIC and OPIC. The United States Industry Coalition (USIC) is a non-profit association of U.S. companies and universities that was established specifically to help companies exploit commercialization opportunities with former WMD experts. Companies that were involved in IPP projects had to be members of USIC. The Overseas Private Investment Corporation (OPIC) helped reduce the financial risk when U.S. companies invested in business opportunities that also furthered U.S. foreign policy objectives. A small number of OPIC loans went to projects involving former Soviet WMD experts, although this was not OPIC's main mission.

A significant though infrequently acknowledged contributor to the reemployment of former Soviet weapons experts was the HEU Purchase Agreement. In 1993, the United States negotiated an agreement with Russia to buy 500 metric tons of highly-enriched uranium from dismantled nuclear weapons. When Russia dismantles a nuclear weapon, it dilutes the highly-enriched uranium (HEU) until it becomes low-enriched uranium (LEU), which can be used as fuel in nuclear reactors. This LEU is then shipped to the United States where it is sold as fuel to the nuclear power industry. Under this agreement, Russia had turned 14,090 nuclear warheads into nuclear reactor fuel by the end of 2008.¹⁷

The HEU Purchase Agreement, which was originally intended to cover a span of twenty years, will eventually provide approximately \$8 billion to Russia.¹⁸ Some of this money, in turn, was used by the Russian central government to fund consolidation and job-creation efforts in the nuclear weapons complex. The HEU Deal, as it is sometimes called, has also provided thousands of jobs for Russian experts, including dismantling nuclear warheads and turning HEU into LEU.¹⁹ Moreover, up until about 2000, approximately one-third of the money Russia earned through this agreement went to the Ministry of Atomic Energy, where it became a significant source of funding for conversion efforts in the nuclear weapons complex.²⁰

Besides the government, several private foundations and organizations provided programs and services that, as of early 2009, continue to impact former Soviet WMD experts. Among these, three figured most prominently.

17. United States Enrichment Corporation, U.S.-Russian Megatons to Megawatts Program, "Fact Sheet," <http://www.usec.com>. The website provides periodic updates of nuclear warhead destruction under the HEU Purchase Agreement.

18. As originally negotiated, the HEU Purchase Agreement would have netted \$12 billion for Russia, but changes in the market price of uranium eventually forced the renegotiation of this amount to \$8 billion.

19. Oleg Bukharin, Harold Feiveson, Frank von Hippel, Sharon K. Weiner, Matthew Bunn, William Hoehn, and Kenneth Luongo, *Helping Russia Downsize its Nuclear Complex: A Focus on the Closed Nuclear Cities* (Princeton, N.J.: Center for Energy and Environmental Studies, Princeton University, June 2000), p. 17.

20. Bukharin, et al., *Helping Russia Downsize its Nuclear Complex*, p. 19.

The National Academies of Science (NAS) provided advice to the U.S. government on scientific collaboration and published important studies about the state of collaboration with former Soviet weapons institutes.²¹ NAS also participated in and reviewed collaborative research with former biological weapons experts and was instrumental in encouraging the U.S. government to seek out and engage key biological weapons institutes in Russia. The Soros Foundation helped some WMD-related cities with their communications infrastructure and provided funding to CRDF. Finally, the Nuclear Threat Initiative (NTI) provided funding, information, and advocacy for various nonproliferation efforts, including those focused on WMD expertise. NTI was created by CNN founder Ted Turner and former U.S. Senator Sam Nunn and can be credited with raising public awareness and lobbying for increased government spending for a variety of nonproliferation efforts, some of which were aimed at controlling the spread of weapons knowledge. NTI funded a variety of studies and status reports about the state of security among former Soviet WMD facilities and workers and maintains a website that offers perhaps the most significant, although sometimes dated, collection of information and analysis about past and current efforts to cope with the legacy of the Soviet WMD complex.²²

Finally, several other countries also started or continue to fund programs aimed at controlling the spread of WMD knowledge. Besides the United States, the Science Centers involve the European Union, Japan, Canada, Norway, and the Republic of Korea; this arrangement is explained in more detail in Chapter 5. In 1991, the European Union launched Technical Aid to the Commonwealth of Independent States (TACIS), a program of financial assistance to former Soviet states that aims to help them with legal, administrative, and economic reform; infrastructure development; environmental protection; and nuclear reactor safety. The International Association for the Promotion of Cooperation with Scientists from the New Independent States of the Former Soviet Union (INTAS), also a creation of the European Union, funds scientific cooperation between states of the European Union and the former Soviet Union. The focus of both TACIS and INTAS is much broader than the proliferation of

21. For example, see National Research Council, Office of International Affairs, *An Assessment of the International Science and Technology Center: Redirecting Expertise in Weapons of Mass Destruction in the Former Soviet Union* (Washington, D.C.: National Academy Press, 1996); National Academy of Sciences, Institute of Medicine, and National Research Council, U.S.-Russian Collaborative Program for Research and Monitoring of Pathogens of Global Importance Committee, *Controlling Dangerous Pathogens: A Blueprint for U.S.-Russian Cooperation, A Report to the Cooperative Threat Reduction Program of the U.S. Department of Defense* (Washington, D.C.: National Academy Press, 1997); National Research Council, Office of International Affairs, *Protecting Nuclear Weapons Material in Russia* (Washington, D.C.: National Academy Press, 1999); National Research Council, *Successes and Difficulties of Small Innovative Firms in Russian Nuclear Cities* (Washington, D.C.: National Academy Press, 2002); and National Research Council, *Biological Science and Biotechnology in Russia: Controlling Diseases and Enhancing Security* (Washington, D.C.: National Academy Press, 2005).

22. See <http://www.nti.org>.

WMD knowledge, but a small number of their grants have involved such experts.

Additionally, the United Kingdom began funding the Closed Nuclear Cities Partnership (CNCNCP) in 2004. Similar to the U.S. Nuclear Cities Initiative, the goals of CNCNCP were to create sustainable non-weapons jobs for nuclear experts and to help improve the social and economic environments in these cities. As of 2007, the UK had committed an estimated \$17 million to these projects and created some 560 jobs, with an estimated 800 additional jobs to follow.²³ A similar program, the European Nuclear Cities Initiative, failed to get off the ground due to problems getting member-state agreement on identifying specific projects for funding.

Finally, although this book focuses on programs aimed at the proliferation of weapons expertise, there is a broader literature that takes a more comprehensive look at CTR, its history, and its implementation. A good start is *Defense by Other Means: The Politics of US-NIS Threat Reduction and Nuclear Security Cooperation*, by Jason Ellis. Ellis provides a history of CTR through the mid-1990s, focusing specifically on implementation in Russia and Ukraine, as well as the role of Congress and interagency politics in CTR's implementation and progress.²⁴ In *Dismantling the Cold War*, John M. Shields and William C. Potter bring together authors who look at U.S., Russian, and NIS perspectives on CTR, as well as case studies of several CTR programs.²⁵ For updates on the status of various CTR programs, as well as an analysis of problems and possible solutions, Matthew Bunn provides yearly updates in the *Securing the Bomb* series.²⁶

Leon Sigal's *Hang Separately: Cooperative Security between the United States and Russia, 1984–1994*, takes a broader look at U.S. aid to the Soviet Union and Russia. Sigal argues that as the Soviet Union was breaking apart, the United States was too hesitant to assist and encourage democratic and market-based reforms or help with nuclear security. As a result, the United States missed many important opportunities to increase its own security and encourage the development of future cooperative relations

23. Department of Trade and Industry, "United Kingdom-Russia Closed Nuclear Cities Partnership (CNCNCP)," <http://www.pe-international.ru/eng>. For more information about CNCNCP, see <http://www.dti.gov.uk/energy/environment/soviet-nuclear-legacy/programme-portfolio/cncp/index.html>.

24. Ellis, Jason D., *Defense by Other Means: The Politics of U.S.-NIS Threat Reduction and Nuclear Security Cooperation* (Westport, Conn.: Praeger, 2001).

25. Shields, John M., and William C. Potter, eds., *Dismantling the Cold War: U.S. and NIS Perspectives on the Nunn-Lugar Cooperative Threat Reduction Program* (Cambridge, Mass.: MIT Press, 1997).

26. See, for example, Matthew Bunn and Anthony Wier, *Securing the Bomb: An Agenda for Action* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom at Harvard University and Nuclear Threat Initiative, 2004); *Securing the Bomb 2005: The New Global Imperatives* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom at Harvard University and Nuclear Threat Initiative, 2005); *Securing the Bomb 2006* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom at Harvard University and Nuclear Threat Initiative, 2006); and Matthew Bunn, *Securing the Bomb 2007* (Cambridge, Mass., and Washington, D.C.: Project on Managing the Atom at Harvard University and Nuclear Threat Initiative, 2007).

with Russia.²⁷ Additionally, *Power and Purpose*, by James M. Goldgeier and Michael McFaul, provides a comparative analysis of U.S. aid to Russia for the promotion of democracy, economic and, specifically, market-oriented reforms, and CTR.²⁸ In parsing out the worldviews of Presidents George H.W. Bush, Bill Clinton, and George W. Bush, and situating this within the parochial issues that dominate domestic and congressional politics in the United States, the book argues that U.S. policy toward Russia has lacked a grand strategy for building and sustaining the cooperative relationship that would be beneficial to both countries. Instead, with the exception of a few years during the first Clinton administration, policy has been hampered by the pursuit of specific domestic and foreign policy interests and conducted in a manner and language that discounts both Russia's own interests and its status as a major power in the international system.

Methodological Issues

Before providing a roadmap for subsequent chapters and arguments, a few pre-scripts are in order. The focus of this book is WMD expertise and the danger of its proliferation from the former Soviet Union. Because Russia inherited the bulk of the Soviet WMD complexes, Russia will be the central focus of attention. Other states of the former Soviet Union are referenced when they help to explain the fate of the Russian weapons complex or the outcome of U.S. activities there.

Additionally, nuclear weapons expertise is my central concern. Although this book refers to all WMD and discusses biological weapons expertise in some detail, this is done so that activities aimed at nuclear nonproliferation can be better understood and put in appropriate context. For example, as the case studies show, it is not possible to understand the deficit in U.S. activities in Russia's core nuclear weapons facilities without also understanding the concurrent rise in emphasis on biological weapons institutes in both Russia and other parts of the former Soviet Union. Although the expertise required for chemical weapons, weapons delivery systems, and nuclear energy is also discussed, this too is done only to further our understanding of the fate of nuclear weapons experts. I claim no comprehensive analysis of these subjects, and the conclusions offered here apply first and foremost to the proliferation of nuclear weapons knowledge.

All of the programs discussed here evolved over time. Two ended prior to 2008, but the Science Centers and IPP continue. This book, however, covers these programs and their processes and results through 2008.

A brief discussion of terminology is also important. This book will refer frequently to weapons of mass destruction (WMD). By this I mean nuclear, biological, and chemical weapons. Although chemical weapons

27. Sigal, Leon V., *Hang Separately: Cooperative Security between the United States and Russia, 1985–1994* (New York: Century Foundation Press, 2000).

28. James M. Goldgeier and Michael McFaul, *Power and Purpose: U.S. Policy Toward Russia After the Cold War* (Washington, D.C.: Brookings Institution Press, 2003).

are often included in the category of WMD, they are not capable of causing the destruction of entire cities or large populations except in very particular circumstances. This is why experts increasingly apply the WMD label only to nuclear and biological weapons.²⁹ It is also the case that, with respect to the proliferation of expertise, the vast majority of U.S. resources have focused on nuclear and biological weapons specialists. I use WMD to refer to nuclear, biological, and chemical weapons simply for ease of use and because almost all U.S. government programs continue to use “WMD” in this manner.

Finally, a word about sources is necessary. The programs at the Departments of Defense, Energy, and State are the case studies I analyze to understand how the United States attempted to discourage the proliferation of WMD expertise from the former Soviet Union. In addition to the small secondary literature on the proliferation of weapons expertise, my conclusions are drawn primarily from two sources. The first is primary documents, including annual reports and other official publications from each program, internal strategic planning documents, memoranda, communications, and project-specific writings.

The second source is the approximately 150 interviews I conducted in the United States, Europe, Japan, and some states of the former Soviet Union. This includes interviews with current and former congressional staff; project participants in various states of the former Soviet Union, mostly Russia; former and current U.S. and Russian government officials; Western business partners; various other individuals who were in some way involved in these activities; and program managers and personnel in the Departments of Defense, Energy, and State. In almost all cases, these interviews are cited here according to affiliations or broader descriptions as negotiated with each interviewee. The reasons for this anonymity vary. In some cases, the projects or jobs of individuals might have suffered due to their candor. In a few cases, former project participants requested that their names be omitted to protect their relationships with individuals or organizations. Sometimes I offered anonymity to encourage a dialogue; in other cases it was granted because naming one interviewee would have made it possible to identify others. I do not provide the names of former Soviet weapons scientists and some experts in Russia in case doing so harms their chances for future collaborative projects, damages their relationships with their parent institutes, or makes them suspect because of shifting interpretations of Russia’s rules and regulations about sensitive information.

The degree to which I rely on anonymous interviews makes my conclusions difficult for others to verify independently. To help mitigate this problem, where possible I cite publicly available information and docu-

29. See, for example, U.S. Congress, Office of Technology Assessment, *Proliferation of Weapons of Mass Destruction: Assessing the Risks*, OTA-ISC-559 (Washington, D.C.: Government Printing Office, August 1993), pp. 52–55; and Wolfgang K.H. Panofsky, “A Damaging Designation,” *Bulletin of the Atomic Scientists*, Vol. 63, No. 1 (January/February 2007), pp. 37–39.

mentation instead of information from interviews. Except in a few places that are noted in the citations, I offer conclusions based upon interviews only when those conclusions can be supported by more than two interviewees or other material.

A Roadmap

This book is organized into three sections. The first part—Chapters 2 and 3—provides the context within which the battle against the proliferation of WMD expertise has been waged. Chapter 2 focuses on the former Soviet Union. This chapter traces the fate of the Soviet defense complex, with particular emphasis on nuclear weapons institutes and experts. Information about structural and social changes that have an effect on WMD experts, as well as Russia's own conversion efforts, is often less than comprehensive or verifiable. With these caveats in mind, the chapter offers a way to evaluate the threat of the proliferation of expertise and how that threat changed after the collapse of the Soviet Union. In turn, the case studies discuss the degree to which U.S. programs adapted in response to these changes.

Chapter 3 provides additional context, but in this case the focus is domestic politics in the United States. Programs aimed at countering the proliferation of WMD expertise were a small part of the wider CTR agenda, which also included programs focused on helping the Russians transport, dismantle, and destroy nuclear weapons, their delivery systems, stockpiles of chemical weapons, and infrastructure and equipment that were once part of the biological weapons complex. Knowledge nonproliferation efforts were strongly influenced by political debates surrounding CTR; Chapter 3 discusses both the process of attaining and sustaining political support for CTR, as well as the consequences specifically for the Defense Conversion program, the Science Centers, IPP, and NCI. In turn, this provides the background for understanding some of the domestic political constraints within which these programs were implemented and which influenced their evolution.

The second part of this book—Chapters 4 through 7—consists of case studies of programs designed to counter the proliferation of WMD expertise. The programs are grouped together in terms of the agency in charge of their administration; those housed in the Defense Department come first, followed by the State Department's programs in Chapter 5. The Department of Energy's IPP and NCI programs constitute Chapters 6 and 7, respectively.

Each case study follows a parallel route. First I describe the program, including details about job creation and conversion projects and how they are developed and managed from the early 1990s through 2008. The specifics of program decision-making and logistics are important; these details provide evidence that is later used to show whether programs were influenced more by a rational assessment of how to meet goals and work around externally imposed constraints, or whether the imperatives of an

institution's history, internal power dynamics, and perceived threats to autonomy were more predominant.

Then, I dissect the relationship between the task each program was given and the goals it came to pursue. More specifically, in each case study I illustrate how a program identified and interpreted the threat from the former Soviet WMD complex, changes in that threat over time, and the resulting adaptations in policy design and implementation. In particular, I focus on performance metrics—that is, the measurements that each program came to use as indicators of its success or failure. The literature on institutions documents the tendency for goal displacement: organizations come to substitute their own measurements for more meaningful indicators of whether they have succeeded at a given task.³⁰ For example, goals may shift to tasks that are more in sync with an organization's sense of its own mission; outcomes become goals because they can be easily measured; or the focus shifts to documenting things an organization does well, rather than the task it was given. Although goal displacement is well-documented in the literature on public policy and organizations and is often assumed by case studies of national security, there are relatively few works that analyze the process of goal displacement in national security institutions.³¹ I help remedy this gap by using part of each case study to discuss the degree to which each program came to focus on something other than the reemployment of WMD experts and why. Moreover, I also clearly establish that originally one of the main tasks assigned to each program was the permanent redirection of WMD expertise through the creation of sustainable non-weapons work outside of the former Soviet WMD complex. In other words, regardless of the tasks that programs came to measure or advertise, one of their core national security missions remained job creation.

Next I turn to the question of results. Here I use two sets of metrics to judge each program. First, I let the programs speak for themselves and assess the degree to which they achieved success as they define it. Unfortunately, in many cases I am able to offer only broad conclusions

30. Classic examples include Peter Blau and W. Richard Scott, *Formal Organizations* (San Francisco, Calif.: Chandler, 1962), p. 220; Anthony Downs, *Inside Bureaucracy* (Boston, Mass.: Little Brown, 1967), pp. 146–147; Charles Perrow, *Complex Organizations*, 3rd ed. (New York: McGraw-Hill, 1986), p. 263; and Philip Selznick, *TVA and the Grass Roots: A Study of the Sociology of Formal Organization* (Berkeley, Calif.: University of California Press, 1949), chaps. 1–2.

31. Many works assume or discuss the role of bureaucratic parochialism in defense and national security institutions and policy, but relatively few deal specifically with how goals come to be displaced and for what reasons. Examples of works that discuss goal displacement more specifically include Harvey M. Sapolsky, *The Polaris System Development: Bureaucratic and Programmatic Success in Government* (Cambridge, Mass.: Harvard University Press, 1972); David Alan Rosenberg, "The Origins of Overkill: Nuclear Weapons and American Strategy, 1945–1960," *International Security*, Vol. 7, No. 4 (Spring 1983), pp. 3–71; Scott D. Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons," *International Security*, Vol. 18, No. 4 (Spring 1994), pp. 66–107; and Lynn Eden, *Whole World on Fire: Organizations, Knowledge, and Nuclear Weapons Devastation* (Ithaca, N.Y.: Cornell University Press, 2004).

rather than systematic analysis. More rigor proves problematic because some programs adopted multiple metrics, each of which requires quite precise data that were not consistently reported by the program or for which independent measurement is difficult. In other cases, programs reported outcomes in an inconsistent or less than thorough fashion and, as a consequence, it is impossible to compare results reported in different years. In each case study, I elaborate on the degree to which these problems are applicable and, perhaps more important, discuss the relationship between the construction of multiple metrics and the constraints placed on a program by its environment. Second, I measure the degree to which each program supported U.S. national security by creating jobs for former Soviet WMD experts. Here, too, there are problems that arise from inconsistent definitions of “weapons expertise” and what it means to create a “sustainable” job, as well as difficulties associated with independent verification of the results as reported by each program. Consequently, in most cases I offer only general estimates of the number of jobs created. In all cases, however, there is enough data to judge whether a program created only a few or many jobs. Moreover, these problems and inconsistencies with measuring and defining job creation by themselves attest to the failure of programs to more directly connect their activities to their original goals.

The final part of each case study examines the reasons behind these outcomes. Here I consider three explanations. Two of these explanations focus on the degree to which the rational pursuit of policy goals is influenced by constraints external to the implementing organization. According to this logic, organizations implement policy based upon a reasoned analysis of how best to mitigate a problem within a given set of constraints. This is more than simply asking whether policy implementation successfully took into account external factors. Organizations are not hostage to their environments; rather, they make strategic choices about whether and how to influence those environments and the limitations they pose. Policy failure can therefore be explained by external constraints or the inability to work around those constraints, not a mismatch between goals and implementation. More specifically, with respect to the task of countering the proliferation of WMD expertise from the former Soviet Union, two such constraints predominate: Russia and U.S. domestic politics.

Russia was often assumed to be or accused of being a major impediment to U.S. nonproliferation goals. There are several variations of this argument. One is that Russian WMD experts had little experience with producing services or technology for commercial purposes or in a market economy. Moreover, the Soviet system skewed scientists toward products that embodied interesting science or made use of available resources, regardless of their commercial value. As a result, former Soviet WMD experts were willing to engage in interesting research but less able or inclined to participate in projects that would cause commercial firms to develop an interest in employing them.³² Another argument is that

32. The overwhelming majority of U.S. project managers or participants that I interviewed

reemploying weapons experts directly conflicted with Russia's ability to maintain a robust WMD complex. Therefore former Soviet institute managers or government officials had incentives to impede U.S. job-creation activities. Third, because of the history of the Cold War and the presumed high value of WMD to national security, the Russian government and in particular its security services were hesitant to cooperate with the United States. In fact, analyses of CTR and related projects, including those aimed at the proliferation of expertise, frequently highlight problems with access to Russian nuclear and biological weapons facilities and experts.³³

The fourth potential constraint was the state of the Russian economy. After the collapse of the Soviet Union, Russia was saddled with significant foreign debt, inflation, and a ruble that was worth little in terms of hard currency. Moreover, the central government was unable to guarantee intellectual property rights, respect for patents, or protect investors from corruption or arbitrary taxes and fees. It is clear that the Russian economy and government were significant barriers to job creation. However, it is also the case that Westerners, U.S. companies, and local Russians did invest. One crude indicator of interest is Foreign Direct Investment (FDI). Statistics from the United Nations Conference on Trade and Development's *World Investment Report* show that FDI in the early 1990s was indeed quite low in Russia, averaging around \$900 million per year.³⁴ FDI had grown to almost \$2 billion by 1995, and to over \$15 billion by 2004.³⁵ By 2002, Russia was considered one of the top twenty-five countries for investment; by 2008, it was considered one of the largest economies in the

who were active in U.S.-Russian cooperation during the early 1990s complained about the difficulties convincing former Soviet scientists to focus on research with commercial potential or for which there was market demand.

33. For examples, see Department of Energy, The Secretary of Energy Advisory Board, Howard Baker and Lloyd Cutler, *A Report Card on the Department of Energy's Nonproliferation Programs with Russia* (Washington, D.C.: Department of Energy, January 10, 2001), p. 22; and Robert J. Einhorn and Michele A. Flournoy, eds., *Protecting Against the Spread of Nuclear, Biological and Chemical Weapons: An Action Agenda for Global Leadership, Volume 1: Agenda for Action* (Washington, D.C.: Center for Strategic and International Studies, January 2003), p. 12. A variety of reports by the Government Accountability Office, formerly the General Accounting Office, offer evidence of the persistence of problems with access. For examples, see General Accounting Office, *Weapons of Mass Destruction: Reducing the Threat from the Former Soviet Union: An Update*, Washington, D.C. (June 1995); General Accounting Office, *Weapons of Mass Destruction: Status of the Cooperative Threat Reduction Program*, Washington, D.C. (September 1996); Government Accountability Office, *Biological Weapons: Effort to Reduce Former Soviet Threat Offers Benefits, Poses New Risks*, Washington, D.C. (April 2000); and Government Accountability Office, *Cooperative Threat Reduction: DOD Has Improved Its Management and Internal Controls but Challenges Remain*, Washington, D.C. (June 2005).

34. United Nations Conference on Trade and Development, *World Investment Report 2001* (New York: United Nations, 2001), p. 295.

35. United Nations Conference on Trade and Development, *World Investment Report 1997* (New York: United Nations, 1997), p. 307; and United Nations Conference on Trade and Development, *World Investment Report 2007* (New York: United Nations, 2007), p. 253.

world.³⁶ Moreover, there is anecdotal evidence that U.S. companies did invest in Russia, including in cities devoted to nuclear weapons work.³⁷ Finally, many of the barriers to investment that concerned companies were precisely the problems that U.S. government programs could help mitigate. As explained by one program participant, the goal was to lure companies into a relationship with Russia before they could be “horrified by the conditions” there and to hook them on the “goodies” before they got scared about doing business in Russia.³⁸

Besides Russia, the other most logical place to look for constraints on the rational pursuit of U.S. nonproliferation goals is in U.S. domestic politics. Here I investigate three possibilities. One is that the president was forced to pursue a goal not of his own making and sought to sabotage these programs by limiting their budgets or placing other restrictions upon their activities. As explained in Chapter 3, George H.W. Bush was hesitant to embrace the CTR agenda, Bill Clinton was initially enthusiastic but later more distracted, and George W. Bush consistently sought to have Russia assume more responsibility. To what extent did presidential support make a difference? A second possibility is that Congress or groups of members within Congress were the source of these constraints. The third option is that the design of these programs was intentionally suboptimal. Even though the creation of a new program would suggest a victory for policy supporters, it is also the case that politicians expect and plan for future struggles over policy. Political scientist Terry Moe argues that programs and policies are often designed with an eye toward the day when supporters are no longer in power.³⁹ Therefore, Moe explains, Congress often saddles policy implementation with restrictions, reporting requirements or other complicated rules that undermine program efficiency.⁴⁰ To what extent did nonproliferation programs suffer such a fate?

In addition to external constraints such as those posed by the president or Congress, a third possible explanation for policy failure can be found within the implementing organization itself. It is no secret that institutions often come to see policy goals in terms of their own interests. An institution’s sense of itself and its mission permeates an agency’s employees and the policies and processes they design to carry out their assigned tasks. But institutional interest is not static; it influences and is influenced

36. A. T. Kearney, Global Business Policy Council, *Foreign Direct Investment Confidence Index, 1998–2005*; Stephen Kotkin, *Armageddon Averted: The Soviet Collapse 1970–2000* (Oxford: Oxford University Press, 2008), p. 203.

37. For example, one of the most successful conversion projects in Sarov was a computer services and programming center started by Intel without any U.S. government funding or cooperation.

38. Interview with Initiatives for Proliferation Prevention staffer 1, July 16, 2003.

39. Terry Moe, “Political Institutions: The Neglected Side of the Story,” *Journal of Law, Economics, and Organization*, Vol. 6 (Special Issue, 1990), pp. 213–253. For an application of this idea to national security institutions, see Amy B. Zegart, *Flawed By Design: The Evolution of the CIA, JCS, and NSC* (Stanford, Calif.: Stanford University Press, 1999).

40. Moe, “Political Institutions,” p. 228.

by internal power struggles, tasks that are non-routine or unfamiliar, past legacies of embarrassment or success, and a host of other factors. For these reasons, policy comes to be a reflection of the implementing organization, rather than a rational assessment of the best means of pursuing a given goal. Policy failure, therefore, can be traced to variables internal to a specific institution. In terms of the fight to control the proliferation of WMD expertise, this means looking at the influence of institutional interest and dynamics in the Departments of Defense, Energy, and State.

The final part of this book—Chapter 8—offers conclusions. These are drawn from across the case studies and from situating those case studies within the context of U.S. domestic politics and the changing nature of the threat from the former Soviet WMD complex. I argue that institutional interest is the most persuasive explanation for why U.S. non-proliferation programs succeeded at engaging former Soviet WMD experts in collaborative research but failed to create more permanent jobs. In all four case studies, policy was implemented using actors and processes that were chosen because of institutional needs, not the dictates of reason or efficiency. Moreover, in each case, these institution-centered influences were made worse by a domestic political environment that made continued program support uncertain. Perhaps most seriously, there is little evidence to support a connection between the changing nature of the threat of WMD proliferation from Russia and U.S. programs aimed at former weapons experts.

Understanding this situation is important for improving efforts aimed at the proliferation of WMD expertise and U.S. national security policy more generally, as well as the policymaking and implementation processes. But there are additional imperatives. As the conclusion argues, the threat from the former Soviet WMD complex changed significantly between the early 1990s and 2008. The proliferation dangers that remain arise from different circumstances and must be met in a different context. Yet U.S. programs to reemploy WMD experts have done little to reconsider this threat. More problematically, they remain wedded to programmatic processes and policy goals that evolved according to their own rather than U.S. national security interests. Furthermore, the Washington consensus, as of 2008, seemed to favor winding down U.S. financing for these programs and turning their maintenance over to Russia. But many of these proliferation concerns matter more to the United States than to Russia, and thus may not receive the attention the United States thinks they deserve. The effort to shift the burden for parts of CTR to Russia also began at a time when that country was flush with revenue from the sale of oil and natural gas. As of 2008, this was no longer the case. For economic reasons, Russia may well come to neglect or abandon these efforts. Finally, the story of U.S. knowledge nonproliferation efforts is important because the United States is in the process of expanding the Science Centers and IPP to new countries and areas. If this is done uncritically, it promises to duplicate or enlarge the failures imbedded within these programs that have caused them to fall short of their mandate.

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