

Disarming the Soviet Legacy:
Cooperation and Contention in U.S.-Russian Nuclear Threat Reduction and
Nonproliferation Assistance Beyond the “Reset”

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Abstract:

Many scholars agree that the greatest threat to both U.S. and international security emanates from the proliferation of weapons of mass destruction to both nation states and non-state actors. After the collapse of the Soviet Union, this threat was intensely magnified. In response, the United States initiated several programs in the former Soviet states to prevent the sale or theft of these weapons, their components, or related expertise from former Soviet scientists. Since their inception, these threat reduction and nonproliferation assistance programs have provided concrete security benefits, but have also suffered from a number of weaknesses that inhibit their effectiveness.

Through analysis of quantitative data and primary-source qualitative accounts across four presidential administrations, this research endeavors to identify the key factors that impact these vital initiatives, specifically those aimed at diminishing the risk from nuclear sources. Influences such as the incidence of terrorist attacks, personal relationships between U.S. and Russian counterparts, the level of trust between corresponding U.S. and Russian military/bureaucratic bodies, program funding, bureaucratic structures, domestic political pressures, and NATO expansion have all impacted the effectiveness of U.S.-Russian cooperation and implementation of threat reduction initiatives. This research also seeks to provide several policy recommendations—aimed at streamlining the bureaucratic process of related programs, maintaining consistency of contacts that endures across presidential administrations, and removing linkage of program funding to other policies—in order to fill critical security gaps and maximize the positive impact of these threat reduction programs beyond the recent “reset” of U.S.-Russian relations.

Variables, Scope, and Terminology

The term cooperative threat reduction (CTR) serves as commonly used shorthand to refer to the general concept of threat reduction and nonproliferation assistance. This title is also the name of a specific program within the Department of Defense (DOD). In order to maintain clarity, CTR will serve as the general reference term, while DOD-CTR will refer to the specific program.

The term ‘fissionable material’ refers to any element that is capable of undergoing the process of nuclear fission (i.e., splitting of the original nucleus, either spontaneously or from the absorption of a neutron). The term ‘fissile material’ refers to any element that is capable of sustaining an explosive fission chain reaction (i.e., fission resulting in the release of two product elements, energy, and additional neutrons, which collide with other nuclei and begin subsequent stages of the fission reaction).^{*} While related, the two concepts are distinct; the former cannot create a self-sustaining chain reaction, while the latter is capable of self-sustained fission and therefore can be used in nuclear weapons.¹

The term ‘direct-use material’ refers to fissile materials that are fully prepared for use in nuclear weapons. For example, uranium comes in several naturally occurring isotopes, mainly U-238 and U-235 (about 99.3% and 0.7%, respectively). U-235 is naturally occurring and is a fissile material; however, due to its rarity, uranium samples intended for nuclear weapons must be enriched. Through the enrichment process, U-235 is separated out from U-238. Eventually, after repeated enrichment procedures, it is possible to obtain a uranium sample containing high percentages of U-235. This is known as highly enriched uranium (HEU),[†] and contains a sufficient U-235 content to be used in weapons. Therefore, U-235 is a fissile material, whereas HEU is an example of both fissile- and direct-use material.²

CTR programs have been developed and implemented to counter the threats from all weapons of mass destruction (WMD), including nuclear, chemical, and biological sources. This research focuses exclusively on nuclear CTR. In addition, while CTR began as a set of programs designed for operation within the former Soviet Union (FSU), they have since expanded to have global reach. This research focuses on U.S.-Russian cooperation, and thus results in a general focus on CTR initiatives within the FSU.

This research seeks to analyze specific factors which contribute to the level of cooperation between the United States and the Russian Federation in pursuit of CTR. This research details the effects of factors such as the incidence of terrorist attacks, personal relationships between U.S. and Russian counterparts, the level of trust between corresponding U.S. and Russian bureaucratic or military bodies, the level of program funding, bureaucratic structures, domestic political conditions, and North Atlantic Treaty Organization (NATO) enlargement. Successful CTR cooperation contains both qualitative and quantitative aspects. Such cooperation can be measured by indicators such as the number of nuclear weapons dismantled through the program, or the quality of a relationship between two diplomats that greatly improved CTR program collaboration between U.S. and Russian officials. Through

^{*} Refer to Figure 1, in appendix.

[†] Uranium can start to create explosive fission reactions at as little as 6% enrichment of U-235, although this requires a near-infinite mass of the substance. HEU is officially defined by the IAEA as containing U-235 content of 20% or higher, reflecting the ability to create a weapon of a practical size. The term ‘weapons-grade’ HEU refers to at least 90% enriched, although weapons can be constructed with less concentrated samples. For example, the “Little Boy” bomb dropped on Hiroshima consisted of HEU enriched to 80%.

analysis of these factors across four American presidential administrations, this research also seeks to provide policy recommendations in order to fill critical security gaps and maximize the positive impact of these threat reduction programs. This topic is of particular importance as the United States and Russia experience a “reset” in their relations; this analysis seeks to illuminate the reasons behind positive and constructive cooperation. The policy recommendations of this research include methods that should be adopted by the United States and Russia in order to ensure the stable continuation of the collaboration revitalized by the “reset.”

List of Acronyms

BPC – Bilateral Presidential Commission
CIA – Central Intelligence Agency
CTR – cooperative threat reduction
DC – Defense Conversion program
DHS – Department of Homeland Security
DOD – Department of Defense
DOD-CTR – Cooperative Threat Reduction Program (‘Nunn-Lugar’ Program)
DOE – Department of Energy
DOS – Department of State
DTRA – Defense Threat Reduction Agency
FSU – former Soviet Union
FY – fiscal year
GAO – Government Accountability Office (formerly the General Accounting Office)
GCC – Gore-Chernomyrdin Commission
GICNT – Global Initiative to Combat Nuclear Terrorism
HASC – House Armed Services Committee
HEU – highly enriched uranium
IAEA – International Atomic Energy Agency
ICBM – intercontinental ballistic missile
KGB – Committee of State Security
(Komitet Gosudarstvennoi Bezopasnosti, Комитет Государственной Безопасности)
Minatom – Ministry of Atomic Energy (later changed to Rosatom)
MOD – Ministry of Defense
MPC&A – Materials Protection, Control, and Accounting
NATO – North Atlantic Treaty Organization
NNSA – National Nuclear Security Administration
NSC – National Security Council
NSS – Nuclear Security Summit
OMB – Office of Management and Budget
PI – principal investigator
PSI – Proliferation Security Initiative
PU – plutonium (chemical symbol)
RASA – Russian Aviation and Space Agency
U – uranium (chemical symbol)
UR – United Russia
USSR – Union of Soviet Socialist Republics
WMD – weapon of mass destruction

Introduction

The Threat: Nuclear Proliferation and Terrorism

Upon the collapse of the Union of Soviet Socialist Republics (USSR), a severe threat to international security became apparent to a few U.S. lawmakers and officials: thousands of nuclear weapons were scattered about the territory of the FSU. In addition to the Russian Federation—the official successor state to the Soviet Union—Ukraine, Belarus, and Kazakhstan inherited tactical and strategic nuclear weapons. These countries became independent nations and major nuclear powers practically overnight. Their relations with Russia, Russia's intentions toward them, and the stable command and control over these significant nuclear arsenals were all uncertain from the American perspective. As American officials became more aware of the chaotic political and economic situation in the FSU, it became clear that the deteriorating conditions were producing a dangerous environment and a major source of nuclear proliferation.

Many nuclear weapons, weapons components, and their storage sites were poorly guarded, if at all. In addition to military warheads and strategic delivery vehicles, vast amounts of HEU and plutonium—the necessary fissile materials required to build a nuclear weapon—were quite vulnerable to theft. As the Russian economy continued to worsen, military spending decreased drastically in a short timeframe. Thousands of scientists, who had devoted their entire professional lives to designing and constructing the dangerous products of the Soviet military-industrial complex, were faced with unemployment or decreased salaries that were paid months behind schedule. These highly trained individuals were placed in economic desperation; although their former Russian employers could no longer afford to pay their salaries, the Iraqis, North Koreans, and Iranians were willing and able to pay exorbitant sums for their expertise.

In response to these dangers, a group of senators and academics created an idea that would later become the Cooperative Threat Reduction Program in 1991. Starting with just the DOD-CTR program, this concept evolved over time, spawning several programs across multiple government agencies. CTR programs were designed and implemented to dismantle these nuclear weapons and their delivery systems, secure direct-use and unprepared fissile materials, and provide civilian employment opportunities for scientists of the former Soviet military-industrial complex.

The Severity of the Nuclear Security Crisis

During the Clinton administration, Kenneth Fairfax sent a number of stirring cables to Washington from the U.S. Embassy in Moscow that provided troubling details on the lack of nuclear security in Russia. Fairfax, a foreign service officer in the embassy's Environment, Science, and Technology section, wrote the cables in response to an interdiction of fissile material at an airport in Munich in 1994. This event, and Fairfax's responses to it, galvanized the Clinton White House, particularly its Office of Science and Technology Policy, into action.

On several tours through Russia in 1994, Frank von Hippel, a nuclear physicist serving in the White House Office of Science and Technology Policy, confirmed the severity of the fissile materials crisis in Russia. Von Hippel's visits were part of a follow-up investigation in response to Fairfax's cables from Moscow. In June, von Hippel visited Building 116 of the Kurchatov Institute. Von Hippel was "dumbfounded" to find that the 70 kg of HEU stored at the facility was

placed in simple lockers; no motion detectors or guards protected the facility. Von Hippel noted that “anyone could have walked off with the uranium.”³

Upon visiting the Mayak facility near Chelyabinsk in October, von Hippel saw first-hand the dismal security conditions in Building 142. A single story warehouse constructed in the 1940s, Building 142 served as a storage facility for large quantities of plutonium oxide fuel. As von Hippel toured the site, he noticed that there were many vulnerable doors and windows, and a “lightweight roof.”⁴ Ventilation shafts provided easily accessible alternate escape routes. The guards did not possess radios to communicate with one another. To make matters worse, employees were not allowed in the building for extended periods of time, due to the immense level of radioactivity in the building. Despite the restriction on personnel access, there were no security cameras keeping watch on the fissile material. Once inside, a thief could access the plutonium oxide fuel quite easily, by cutting a sealing wire, uncovering a 20 kg lid, and reaching into the storage trench to pull out the small fuel containers. The containers themselves were held together with “easily defeated lead seals.”⁵ After initial storage, no inventory assessments were conducted to check for any potential thefts or losses.

Von Hippel was shocked to see the lack of security at Building 142. What was even worse was the size of the facility – potential thieves, terrorists, or material acquisition spies from aspiring nuclear governments were bound to focus on this site. Building 142 housed 10,250 containers in its storage trenches, each holding 2.5 kg of the fuel – totaling 25,625 kg of plutonium oxide. This one building contained enough material to create thousands of bombs.

Upon their discovery of the helpless state of nuclear security in the countries of the FSU, American diplomats and officials were shocked. They wondered how such sophisticated technologies, institutes, reactors, and scientists could operate with a near-total disregard for safety mechanisms. In the Soviet system, there were security measures – but they were largely targeted at the people, not the materials.

As a closed country, the USSR banned international travel, except for a few privileged individuals—most of whom, if not high level political officials, were chosen as potential candidates to travel due to close family members remaining in the USSR. This way, if the traveling individual was found to defect or release information, the Soviet government potentially retained threatening blackmail leverage against the defector’s family.⁶

Travel within the USSR was also regulated and closely watched. Some nuclear facilities (particularly military-oriented ones) were located in closed and secret cities. In these secret cities, security was tight, with protective fences, armed guards, and Committee of State Security (KGB) surveillance everywhere. Security outside the secret cities was also driven by personnel surveillance. The closed society and intimidating watch of the secret police service coerced compliance out of those involved with the nuclear-industrial complex. However, with the dissolution of the USSR, these controls no longer existed. In parallel with von Hippel’s tours to the Kurchatov Institute and Mayak facility, the Joint Atomic Energy Intelligence Committee (JAEIC) prepared a report regarding the fissile material crisis in the FSU. JAEIC subsequently reported the number of fissile material storage facilities across the entire territory of the former Soviet Union with safeguards comparable to Western standards: zero.⁷

The Proliferation of Nuclear Expertise

Intact weapons and poorly guarded HEU and plutonium were not the only proliferation risks associated with the collapse of the USSR. The scientists, engineers, and weapons experts

who were employed under the Soviet military-industrial complex also became a significant proliferation liability. After an extended period devoted rigorous study at the most prestigious universities and institutes of the USSR, scientists' salaries dropped immensely as funding for the military industrial complex disappeared. Many of these scientists were not motivated simply by greed; the former Soviet nuclear complexes, now under the responsibility of the governments of the newly independent states, were so drained of funds that these highly trained professionals could no longer provide basic essentials for their families. American experts began to realize that these scientists needed to find alternate means of income; many struggled to buy even food and medicine. Considering the fact that their own governments could no longer support their services and the highly sensitive nature of the skills endowed upon them, experts began to worry about grave proliferation threats. Sure enough, recruiters—mostly from Iran, North Korea, and Iraq—approached these professionals with generous offers and the opportunity to support their families once again.

In February 1992, Secretary of State James Baker visited Chelyabinsk-70, one of the major nuclear weapons design laboratories of the USSR. Baker was surprised to find that the employees revered him almost as a celebrity. Despite their jubilation upon Baker's arrival, the scientists turned grim as they tried to explain their circumstances to the Secretary of State. Baker was stunned by the state of disrepair at Chelyabinsk-70. Apart from the appearance of the building and the lack of technology, Baker found that most scientists were receiving a salary of \$15 per month.⁸ The problem was compounded by the number of individuals thrown into this desperate situation: Chelyabinsk-70, just one facility of the sprawling former Soviet nuclear complex, employed 16,000 people, including 9,000 technicians and 7,000 engineers and scientists. It would be virtually impossible to ensure that none of these individuals were successfully approached by the recruiters of foreign governments.

In 1993, the Russian government became aware of the extent of foreign recruitment efforts in the FSU. Law enforcement forces stopped a group of about twenty families at a Moscow airport as they were about to leave Russia. The group had been contacted by the North Koreans as part of a wider effort to recruit an entire missile design team. One of those sent home by the Russian government, Yuri Bessarabov, informed a newspaper service that his dismal salary—consisting of less than that of the local dairy workers—was laughable compared to the amount the North Koreans were offering: \$1,200 per month.⁹

The situation at Chelyabinsk-70 did not improve as time progressed. On September 9, 1996, Vladimir Nechai, the director of Chelyabinsk-70, wrote to Russian Prime Minister Viktor Chernomyrdin. At that time, the Russian government was \$23 million in debt to Chelyabinsk-70. The government had not paid for work that was already accomplished, and it owed \$7 million in salaries, which had not arrived since May.¹⁰ Nechai was begging for the government to release funds to Chelyabinsk-70 – his laboratory was \$36 million in debt for unpaid utilities and materials procurement. The laboratory lost usage of its long-distance phone due to unpaid utility bills. Nechai's employees could no longer provide basic school supplies for their children.

The employees and laboratory leadership had come up with several schemes to survive off their meager resources. Nechai informed the Prime Minister that “lists are being put together for the distribution of bread on credit, and the enterprise isn't in a condition to provide even this for everyone.”¹¹ The Director had taken personal responsibility for the laboratory's woes, and began taking out loans from private banks in a futile effort to repay the wages and utilities. Meanwhile, many scientists of the military-industrial complex protested outside the Ministry of

Finance demanding the repayment of their salaries. The government promised to pay a fraction of its obligations, but even this amount was not reached when the money finally arrived.

On the night of October 30, 1996, Nechai wrote a message in his journal. He detailed the problems of his laboratory and the immense stress under which he was being crushed. Over his professional career, he had worked at Chelyabinsk-70 for 30 years, working his way to the directorship of one of the most prestigious laboratories in the entire nation. He had been so proud of himself, of the laboratory, of his employees; now, he couldn't even bear to look them in the eye. That night, Nechai shot himself. The knowledge proliferation crisis in the FSU had reached an incredible extent.

The Impact of Scientific Expertise and Nuclear Terrorism

The possession of fissile material—either HEU or plutonium—is the primary barrier to obtaining a nuclear weapon. Without fissile material, a nuclear explosion is physically unachievable. The amount of HEU or plutonium required to create a nuclear weapon depends on the design of the nuclear device, as well as the isotope and purity of the fissile material. In addition to other threats posed by the leak of nuclear expertise, scientists could theoretically support terrorists by helping to design a nuclear weapon. Improved weapon designs in the hands of terrorists imply several corollaries: (1) increased potential explosive yield, (2) the ability to achieve supercritical mass (i.e., a nuclear explosion) with a smaller quantity of fissile material, and (3) the ability to create a smaller device, which would be more easily concealed or transported.

The International Atomic Energy Agency (IAEA) has defined several “significant quantities,” which are the amounts of a particular fissile material required to create a first-generation nuclear explosive device.* These significant quantities are typically used in general reference information regarding improvised nuclear devices (INDs), the devices that would be constructed by terrorists. In this research, subsequent references to the amount of fissile material required to construct a nuclear weapon, in a terrorism context, are based off the IAEA significant quantity values.

Figure 2. Fissile Material Quantities Required to build a nuclear weapon^{12,13,14}

<u>Significant Quantities</u>		<u>Bare Critical Masses</u>		<u>Advanced Weapons Design</u>	
U-235 (in HEU)	25 kg	U-235 (in HEU)	52 kg	U-235 (in HEU)	12 kg
Pu-239	8 kg	Pu-239	10 kg	Pu-239	4 kg
U-233 [†]	8 kg	U-233	16 kg		

* A “first-generation nuclear device” is a fission bomb similar to those used in 1945 that would not require testing before use.

[†] U-233 is generally rarer than U-235 in weapons grade uranium stockpiles around the world. While U-233 is a fissionable material and theoretically a strong candidate for use in nuclear weapons, it is not naturally occurring, more difficult to manufacture than Pu-239, and is more difficult to handle in terms of radiation and storage safety. U-233 is manufactured through the process of neutron capture in thorium-232. If thorium-based fuels are widely adopted in the global nuclear industry, the stockpile of U-233 worldwide may significantly increase. It is widely published that there are no U-233 bombs in existing nuclear stockpiles.

Professionally designed nuclear weapons contain many components other than their uranium and plutonium cores, the most important of which are neutron reflectors and tampers, which both act to increase the efficiency of the fission reaction. Neutron reflectors, such as beryllium, encapsulate the fissile core and improve fission reaction efficiency by reflecting neutrons (that would have otherwise escaped the reaction) back toward the pit of fissile material. This reflection increases the likelihood of these neutrons colliding with other fissile nuclei. A tamper, on the other hand, improves reaction efficiency by delaying the expansion of the fissile material during the chain reaction, ensuring that a greater percentage of the total fissile core actually undergoes the process of nuclear fission (refer to figure 3, in appendix).

According to declassified information from the U.S. government, it is possible to create a nuclear device with as little as 4 kg of plutonium – although a study performed by the National Resources Defense Council argues that in extreme conditions, only 1 kg would be required. The NRDC study assumes conditions of total minimization (resulting in a 1 kiloton (kt) detonation, a significantly smaller yield than that assumed in the IAEA’s significant quantities), and highly advanced weapon design.¹⁵

This 1 kt yield scenario should not be discounted or neglected; while technically difficult to accomplish and significantly less damaging than the IAEA assumed first-generation device, 1 kg of plutonium is an incredibly small quantity. This means that given the technical expertise, the primary barrier to a nuclear weapon, possession of direct-use fissile material, is significantly decreased.

Also, a 1 kt explosion would still rank by a large margin as the largest terrorist weapon ever used. Such a device would release 551,268 times the energy of the bomb detonated in Oklahoma City in 1995 (the Oklahoma City bomb was calculated to be equivalent to 1,814 kg of TNT).¹⁶ In addition, small-yield devices could potentially be housed in extremely small containers, greatly easing the logistical application of such a weapon by terrorists. The MK-54 Special Atomic Demolition Munition (SADM), for example, was a small nuclear device with a 1 kt yield built by the United States during the Cold War. The MK-54 SADM could be contained in a cylinder measuring only 16 by 23 inches.¹⁷ Such a weapon, if built by a terrorist group assisted by scientists, could fit into a hand-held suitcase.

Former Scientists trained in nuclear weapons design pose a significant threat as potential proliferators of weapons expertise to both nuclear-aspiring governments and terrorist groups. Weapon design experts, if recruited to do so, could provide critical knowledge that greatly reduces the barriers to obtaining a functional nuclear explosive.

The character of U.S. threat reduction and nonproliferation assistance programs has continually changed across the administrations of each of the four post-Cold War presidents—each benefitting and suffering from unique circumstances and events in global affairs, U.S.-Russian relations, political climates in both countries, and economic conditions. Beyond these factors, there are a number of core internal aspects, specific to the operation of the programs themselves, which also impact their effectiveness.

Literature Review

In his book, Not Whether But When: The U.S. Decision to Enlarge NATO, Dr. James Goldgeier accounts in detail the Clinton administration's decision making process regarding NATO expansion. First, Goldgeier provides a historical context, including the end of the Cold War and President Bush's discussion with Soviet President Gorbachev regarding the unification of Germany and NATO. Goldgeier then chronicles the domestic policy process in which "policy entrepreneurs" were able to shape the discussion within the Clinton administration regarding the decision to expand NATO. In addition to the policy entrepreneurs, there were political entrepreneurs who altered the political landscape in order to become more receptive of NATO enlargement, and less comfortable with unchanged borders of the alliance.

In Goldgeier and McFaul's Power and Purpose: U.S. Policy Toward Russia After the Cold War, the authors provide a history of the Soviet collapse and the policy questions this significant event raised. Above all else, Secretary of State James Baker moved rapidly in order to resolve the policy debate on Ukraine, Belarus, and Kazakhstan's possession of nuclear weapons. Baker was certain that the disarmament of these states and the return of nuclear weapons to Russia would be in the best interests of the United States. Goldgeier and McFaul argue that it was solely due to Baker's efforts that this became the policy decision of the Bush administration, which took a hands-off realist approach to the situation in the former Soviet Union. Without Baker's forceful influence over the policy, the Bush administration would have preferred to allow the newly independent states balance Russia as nuclear powers along its borders.

In The Dead Hand: The Untold Story of the Cold War Arms Race and its Dangerous Legacy, David Hoffman provides an incredible amount of detail about the character of the nuclear, chemical, and biological weapons programs of the Soviet Union. Through countless interviews and declassified official documents, Hoffman pieces together the state of the Soviet WMD complex at the end of the Cold War and past the collapse of the USSR. Hoffman's interviews with officials of the Clinton administration, Russian scientists, and those who were intimately involved in the events of the 1990's on both the Russian and American sides provide vignettes that capture the reality of the situation in the FSU and in the political decision making process of the Clinton administration.

The National Research Council, in conjunction with the U.S. National Academies and the Russian Academy of Sciences, produced a report titled, "Overcoming Impediments to U.S.-Russian Cooperation on Nuclear Non-Proliferation: Report of a Joint Workshop." The National Academies and Russian Academy of Sciences hosted a workshop for American and Russian officials both inside and separate from the military. These assembled professionals worked in the field of CTR on behalf of their respective governments. Based on background papers written by both sides, the Russian and American colleagues together discussed the positive and successful aspects of their work, and commented on the factors that hindered their working relationship. The report is written based on the background papers, the resulting discussion, and further interviews with CTR professionals.

In his report, "Indispensable Institutions: The Obama-Medvedev Commission and Five Decades of U.S.-Russia Dialogue," Matthew Rojansky describes the different institutions and

strategies that Moscow and Washington have utilized in their bilateral relations since the Cold War. Rojansky writes that due to the extreme ideological divide of the Soviet Union and United States, these nations minimized any interaction between their citizens, except for circumstances that were specifically sanctioned and monitored by government. Thus, any U.S.-Russian cooperation, whether a part of or outside of government, required facilitation by government and bilateral structures. Rojansky argues that due to this legacy of bilateral communication, successful communication and collaboration between Russia and the United States requires well established institutions. He concludes that high-level attention and concrete, practical goals will be necessary to ensure that U.S.-Russian communication, including the BPC, results in achievable results.

Strobe Talbott chronicled his time serving in the State Department as Clinton's closest adviser on Russian affairs in his memoir, The Russia Hand: A Memoir of Presidential Diplomacy. Talbott recalls his work with the President, his colleagues in the State Department, and various Russian statesmen. Through this account, the reader can see the true mechanics of the U.S.-Russian relationship and the importance of highly developed personal rapport between statesmen. Talbott's relationship with Georgi Mamedov is chronicled here; the reader sees how vital the Mamedov-Talbott connection was in advancing U.S.-Russian cooperation across the entire policy agenda of these two nations, including nonproliferation issues.

In Our Own Worst Enemy? Institutional Interests and the Proliferation of Nuclear Weapons Expertise, Dr. Sharon K. Weiner describes the group of CTR programs instated to prevent the proliferation of Soviet weapons expertise. Weiner provides four case studies of such CTR programs and details the projects' development over time. She concludes that the role of institutional self-interest highly influences the design, goal setting, implementation, and adaptation of efforts to engage and reemploy scientists. Weiner makes several assertions. First, a program's attributes and success depends on the character of the bureaucratic organization that administers it. Second, Weiner contends that program goals become displaced to serve the self interest of the organization rather than the initial design goal of nonproliferation. Finally, Weiner also concludes that CTR expertise programs failed to secure significant and consistent support from the American domestic political establishment, especially from Congress; therefore, acting in their own institutional self interest, these knowledge nonproliferation CTR projects competed with one another for limited support of the Congress.

The George H. W. Bush Years: 1990-1993

Regime Change and the Emergence of the Four Eurasian Tigers

Following the August 1991 coup attempt against Soviet President Mikhail Gorbachev, it became clear that the Soviet Union would soon cease to exist. Taking into account the Bush administration's hands-off approach toward the internal affairs of the incoming regime change in Moscow, the most pressing question for the administration at this point in time was on the fate of the nuclear arsenal of the USSR.¹⁸ Previously, the entire nuclear force structure belonged to the Soviet Union and was controlled from Moscow, but the weapons themselves were spread over 4 republics: Ukraine, Belarus, Kazakhstan, and Russia. As the continued existence of a single

Soviet state looked less and less likely, uncertainties began to arise on what would happen with the weapons.

Of the warheads based outside of Russia, Ukraine possessed an arsenal of over 1,600 strategic (long range) warheads, consisting of 130 SS-19 intercontinental ballistic missiles (ICBMs), each containing 6 warheads; 46 SS-24s with 10 warheads each; and 30 strategic bombers. 1,400 strategic warheads were located on the territory of Kazakhstan, including 140 SS-18 ICBMs (10 warheads each) and 40 nuclear-capable heavy bombers. Finally, Belarus had 81 SS-25 ICBMs (1 warhead each) on its territory.¹⁹

The Bush administration officials agreed to take a realist approach to the issue – it was clear that the United States should pursue a policy of attempting to “‘reorganize’ the Soviet nuclear weapons systems in a way that enhanced American national security” – but the best method with which to go about this goal was disputed. Most in the administration argued that having 4 nuclear-armed states emerge from the FSU would be a positive development for the United States. They postulated that the best way to ensure that Russia could not re-emerge as a threatening superpower was to balance it with 3 other nuclear powers on its borders. Taking a zero-sum competitive approach to U.S. and Russian relative power vis-à-vis one another, they argued that “the weaker Russia became, the more secure the U.S. became.”²⁰

On the other hand, Secretary of State James Baker led the administration officials who thought that U.S. interests would be best served by returning all nuclear weapons to Russian territory. Baker saw the loss of nuclear command and control as the major risk of a post-Cold War Eurasia, not Russia’s resurgence.²¹ In Baker’s view, maintenance of order was paramount – just as there had been one Soviet nuclear power during the Cold War, Eurasia and the United States would be most secure if only Russia (the official successor state to the Soviet Union) retained control over the entire arsenal. Despite the fact that Moscow represented the most formidable adversary of the United States for 45 years, Baker felt that the former Soviet nuclear arsenal in the hands of one reliable state was a more stable and predictable environment for the United States to address.

Baker lobbied the Ukrainian, Belarusian, and Kazakh leadership to disarm and sign the nuclear non-proliferation treaty (NPT). In May 1992, The U.S., Russia, Ukraine, Kazakhstan, and Belarus all signed the Lisbon protocol to the Strategic Arms Reduction Treaty (START); under Article V of the Protocol, Ukraine, Belarus, and Kazakhstan all pledged to adhere to the NPT as non-nuclear weapon states “in the shortest possible time.”²² President Nazarbayev of Kazakhstan, President Kravchuk of Ukraine, and Chairman Shushkevich of the Supreme Soviet of the Republic of Belarus all sent letters to President Bush informing him of their intent to fully disarm within a 7 year period, within the agreed upon frameworks of the START treaty.

Domestic Political Pressures: The Nunn-Lugar Amendment, the U.S. Congress, and Birth of CTR

In 1991, as the impending collapse of the USSR was drawing closer, arguments erupted in the American domestic political discussion: for 45 years the USSR was the principal external threat and adversary of the United States, but it was unclear how to approach this new unipolar world as the sole remaining superpower.

Seemingly endless quantities of money were spent during the Cold War, containing the threat of international communism and funding an extraordinary arms race. Now that the Soviet threat was disappearing, opinions differed on how to spend the recently emerged ‘peace

dividend.’²³ Some argued that former defense spending should be cut from the budget altogether, while others contended that it should be transferred to domestic spending, in the name of job creation, infrastructure, and business development.

Congressman Les Aspin of Wisconsin, Senator Sam Nunn of Georgia, and Senator Richard Lugar of Indiana contended that the external threat posed by the Soviet Union had not completely disappeared; it had transformed from deliberate aggression from one adversary to instability and WMD proliferation to many potential adversaries. The most effective method of ensuring the security of the American people was to secure the former Soviet WMD complex in a preventive manner – before weapons, materials, and sensitive expertise leaked from the FSU to governments aspiring to create their own WMD, or to terrorists.

Their proposals, which eventually adopted the name of cooperative threat reduction, or the ‘Nunn-Lugar’ programs, would eventually change the nation’s understanding of national security in a fundamental manner. The critical obstacle was convincing the Congress that CTR did not constitute unnecessary foreign aid or ‘assistance to Russia in funding the weapons pointed at America.’

On August 28, 1991, Aspin defended his logic behind assistance to the FSU. It would prove to become “another form of defense spending,” he argued, to protect not from “deliberate Soviet attack,” but from the “bigger threat” of “chaos in a nation with 30,000 nuclear weapons.”²⁴ The concept did not favor well with the Congress—Aspin and Nunn’s \$1 billion proposal was struck from the 1992-1993 National Defense Authorization Act.²⁵

Nunn and Aspin continued to push for their idea. On November 19, they met with Senator Richard Lugar, Ashton Carter (a nuclear expert from Harvard, who would eventually go on to become assistant secretary of defense under President Clinton), William Perry (then a Stanford professor, who would eventually become the secretary of defense), and Brookings Institution scholar John Steinbruner to discuss their concerns. Eventually, Aspin and Nunn’s desire to provide financial assistance to the Soviet Union became the much more refined and clearly delineated concept of cooperative threat reduction. They presented their proposal to the Congress once again.²⁶

Senator Nunn was frustrated with the Congress’ resistance to the legislation. There were several sticking points preventing the passage of the legislation: the amount of funding devoted to the authorization; the perception of threat reduction spending as unnecessary “foreign aid;” and the perception that U.S. taxpayer money would be spent to boost Soviet defense spending, which could then be turned around to increase Soviet military capabilities against the United States.

In his remarks to the Senate on November 21, 1991, Nunn challenged that the proposed amount of funding was too high. He said,

*“To those who are saying how can we afford to spend \$1 billion... or \$500 million out of the defense budget for this purpose, my answer is how can we afford not to when we may very well spend literally hundreds of billions if not trillions of dollars in the years to come to protect against and to deter and defend against a proliferated threat around the world that has come from the arsenal breakup in the Soviet Union while we sat by and did nothing about it.”*²⁷

Nunn also attempted to set the record straight for those who misrepresented the CTR proposal as unnecessary foreign aid. He expressed his frustration with those who “would stand up on the floor of the Senate and behave as if this is a foreign aid provision, the equivalent of providing money to build a dam in some country in Africa or Asia,” when the money was intended for the

“safe storage and the destruction and dismantlement of nuclear weapons that have been pointing towards this country and our allies for the last 30 years.”²⁸

Yet, despite Nunn’s best efforts, he had not yet successfully convinced the Congress. Senator Roth of Delaware followed up Nunn’s comments with his own views on spending in a post-Soviet world. First, he voiced his intent to vote down the defense authorization bill because “it spends too much money and misses opportunities to save money.” Next, he went into a critique of the CTR proposal:

“Specifically, I was disturbed by the Conferees’ decision to make \$1 billion available to the Secretary of Defense for aid to the Soviet Union... If this proposal had prevailed, we literally would have taken \$1 billion out of our defense budget so that the Soviets could spend \$1 billion of their own money on their defense... We may need to provide humanitarian assistance to the republics that comprise the Soviet Union. It is my firm opinion that any assistance to the Soviet Union must have clear near-term benefit for the United States, as well as being in our long-term strategic interest. The conferees’ proposal did not meet that criteria, and I am happy to see that aid provision has now been removed from the conference report.”²⁹

Roth continued to provide his own suggestion for what should be done with the money. He stated that “it is essential that this economy be reflected in greater savings in the defense budget.” He then referenced a plan to “stimulate the economy by returning the peace dividend to the American taxpayer,” by “restoring jobs, opportunity, and growth to America.” His brief history of the economic plan clearly demonstrated his narrow view of national security threats only stemming from active and deliberate aggression from the USSR or Warsaw Pact nations. “I proposed a similar plan last year when the Warsaw Pact threat disintegrated and the economy began to slow.”³⁰

After Congress struck the proposal from the defense authorization bill, Nunn and his colleagues, both Republicans and Democrats, appealed to officials in the executive branch in an attempt to garner support from the White House and the military establishment. Senators John Warner of Virginia and David Boren spoke with Central Intelligence Agency (CIA) director Robert Gates and acquired his support, while Senator Nunn successfully convinced Deputy Secretary of Defense Donald Atwood of CTR’s importance.

In his remarks to the Senate on November 21, Nunn stated his concern about the White House’s lack of involvement, despite the fact that it had shown interest in the proposition. Nunn said, “Without the President’s involvement and without White House leadership, it is going to be very, very difficult to overcome opposition to what some perceive to be a foreign aid request... What we have is a lot of key individual people in the administration that believe we ought to do something about this, but we do not have the kind of leadership we need right now.”³¹

By the end of November, Senators Nunn and Lugar were able to draw 68 votes in the Senate for their amendment to the defense authorization bill, and the ‘Nunn-Lugar’ Cooperative Threat Reduction program was born (at this time, CTR only consisted of one program, DOD-CTR). Although President Bush signed the bill, his administration did little to act on the \$400 million they were authorized to spend on dismantling nuclear weapons. As Dennis Ross, adviser to Secretary of State Baker remembered, the Bush administration suffered from “intellectual fatigue.”³² In the wake of the Persian Gulf War, re-mobilizing the administration to start engaging in difficult negotiations and meetings with the Russians was hardly attractive.

Bureaucratic Structures

Although Baker was arguably the biggest advocate in the Bush administration who was acting on securing the former Soviet WMD complex, his State Department had little power over what happened; the Nunn-Lugar program clearly would reside within DOD, which had a budget both large and flexible enough to provide the funding. Although he left his post without acquiring the amount of direct responsibility over the Nunn-Lugar DOD-CTR program that he desired, Baker contributed a critical first step. Baker's concern over unified command and control of the former Soviet arsenal and subsequent agreements with the Ukrainian, Kazakh, and Belarusian leadership on the Lisbon Protocol to START provided the invaluable political foundation for DOD-CTR in these countries.

Contrary to Baker and the State Department, DOD was less enthusiastic about CTR—particularly the Defense Conversion program—partially due to the mismatch of program and department missions. The Defense Department's mission had always been to improve and maintain U.S. military capabilities. The Defense Conversion (DC) program, on the other hand, was started in order to match U.S. companies and former Soviet military-industrial entities in order to demilitarize and develop civilian projects for these companies. The DC program in particular suffered from an ongoing perception that business development in the FSU was not a core mission of the United States Department of Defense.³³ Unfortunately, the bureaucratic structures and procedures of the DOD were poorly suited to business development and defense conversion; to make matters worse, the attitudes within DOD regarding the DC program provided little motivation to diagnose these issues and change them.

One such example was the Defense Conversion program's procedure in selecting U.S. businesses to be matched up with Russian partners. The DOD utilized its standard bidding process for selecting contractors, which used a standard metric of finding the lowest bidder. Metrics related to the end-goal of the program—such as previous experience in Russia and the FSU, a company's willingness and ability to invest in high-risk environments, and a suitable level of technological advancement—were not the focus of the contractor selection process. This led to non-starters in many match-ups; in some cases, Soviet institutes were insulted by the low level of technology and lack of practical scientific application the proposed projects contained. Many of the U.S. companies selected for the program were poorly suited to do business in the FSU altogether, never mind provide sufficient expertise in order to assist former Soviet military organizations in converting to civilian practices.³⁴

Although these issues were not pervasive across the entire spectrum of projects, the Defense Conversion program suffered from a brutal combination of ailments: redundancy due to a coexisting semi-analogous program (the Defense Enterprise Fund), a lack of Congressional support, lack of demonstrable success, and lack of enthusiasm for business development projects from DOD. In 1995, Congress prohibited further funding for the Defense Conversion program and it was officially cut.

Program Funding

The Nunn-Lugar amendment's final language approved by the Congress called for an authorization to transfer DOD funds toward CTR purposes, as opposed to an independent appropriation, in which funds must be spent for a particular objective. This meant that the Soviet Nuclear Threat Reduction Act of 1991 only allowed the Defense Department to spend funds on

CTR programs by diverting money from its other preexisting programs.³⁵ DOD officials were naturally resistant to sacrifice a portion of their own budget for activities outside their mission and appropriation. While CTR was recognized as an important mission, few of the funds were spent during the Bush administration; this was mainly due to negotiation difficulties with the Russian Ministries of Defense and Atomic Energy. Funds could not be spent if delegations failed to fully agree on terms governing a particular program.

During this period, CTR funding remained constant at \$400 million. Congress earmarked funds for specific DOD-CTR projects; at the inception of the Nunn-Lugar program, there was only one program funded by Congress, and these projects all fell within the purview of DOD-CTR. DOD-CTR at that time was responsible for all of the concerns that the senators had raised: weapons dismantlement and storage, improvements of fissile material security, and initiatives to provide employment to former Soviet weapons specialists that could potentially sell their expertise. These core objectives would eventually be split between DOD, the Department of Energy (DOE), and the Department of State (DOS), under many different program titles funded by Congress.

DOD-CTR's quickest contribution came in the form of weapons transportation security. Transportation security projects, such as providing armored blankets and railcar security enhancements, were funded to protect weapons and warheads while en-route between storage and dismantlement facilities. The primary issue hampering the progress of weapons dismantlement and other CTR activities was not related to the amount of funds, but the lack of specifically identified projects. No U.S. government funds could be spent without approved proposals. Due to difficulties in discussing sensitive details with Russian officials, reaching a consensus on optimal solutions, and estimating project costs, the process of CTR project approval was quite problematic. A June 1992 General Accounting Office (GAO)^{*} testimony detailing the implementation of the Nunn-Lugar amendment states, "Defining and validating specific act-funded projects has proven to be a challenging task."³⁶

Level of Trust between Corresponding U.S. and Russian Military/Bureaucratic Bodies

At the start of the CTR program agenda in 1991, the dialogue between the American and Russian militaries largely concerned enabling agreements. Logistical solutions such as providing proper containers for storage of nuclear material and helping Russia to respond to any nuclear accidents that may have occurred had to be addressed first on the CTR agenda, as opposed to direct talks and actions in dismantling weapons.³⁷ In addition, U.S. officials were required to negotiate so-called "umbrella agreements," in which legal and customs arrangements were delineated for U.S. assistance programs. The umbrella agreements also included clauses regarding American delegations' and work teams' unique legal privileges and immunities in the partner countries of the FSU.³⁸

The umbrella agreement that governs U.S.-Russian CTR work is officially known as the "Agreement between the Russian Federation and the United States of America concerning the Safe and Secure Transportation, Storage, and Destruction of Weapons and the Prevention of Weapons Proliferation." This agreement initially entered into force in 1992, with a life of 7 years. (Additional protocols to the original agreement extend the document's jurisdictional period; the first was signed in 1999 with an extension to 2006, for example.)³⁹ Umbrella

^{*} The General Accounting Office was later re-named the Government Accountability Office in 2004, keeping the same acronym.

agreements were signed with each of the former Soviet countries before CTR-related activities began on their sovereign territory. Implementing agreements are signed under the governing umbrella agreements; these regulations apply only to the specific program for which they were written, and allow flexibility for bureaucratic and jurisdictional factors to be changed as needed between projects and agreements.

Once the U.S.-Russian dialogue turned from a legal to military nature, the delegations ran into serious impediments. At that point in 1992, the U.S. and Russian militaries had barely developed a working relationship—one which was understandably slow to mature, considering the extended confrontation between these two institutions over the course of the Cold War. As a result, strong misgivings and trust issues from both sides remained pervasive. According to the June 1992 GAO testimony, progress in execution of the Soviet Nuclear Threat Reduction Act of 1991 was mired in trust issues.

In one instance, Russian officials sought help in constructing a large facility in which to store weapons-grade HEU and plutonium, citing the lack of secure storage space as the “major bottleneck in Russia’s dismantlement process.”⁴⁰ The Russian teams understood that if they were to proceed with dismantlement of nuclear warheads in the name of mutual security and the prevention of nuclear proliferation, the resulting fissile material should be stored in a secure location to avoid vulnerability of direct-use material.

The American teams were highly skeptical, however, and reluctant to help with this effort. The GAO official stated that “in our view, the Russian request raises numerous questions concerning both the facility and its role in the ultimate disposal of these materials in a way that minimizes the risk that they could be reused for weapons.”⁴¹ Without positive and verifiable assurances from the Russians on the future use of the direct-use material, U.S. defense officials would not make any arrangements for assistance in constructing the facility—this too would contradict one of the main purposes of the DOD-CTR program. However, the Americans’ counterparts would not allow verification measures because they felt this information would be too sensitive to share. In some cases, Soviet officials were not even willing to discuss designs of the project, never mind provide access to the storage facility. The GAO testimony states that “according to executive branch officials, Soviet officials were initially reluctant to discuss U.S. assistance initiatives in detail.”⁴² Although it was noted by the time of the testimony that Soviet counterparts were more “open and detailed,” this lack of trust was characteristic in the early stages of CTR.

One main hindrance to CTR efforts during the Bush administration was a concerted effort across the entire Russian government and military to prevent U.S. officials from accessing ‘sensitive information’ of any kind. Despite DOD’s mandate to assist the Russian military in dismantling nuclear warheads, the Russian military insisted that it “neither needs nor wants a direct U.S. role in its dismantlement operations.”⁴³ DOD officials conceded that safely dismantling warheads would require “personnel with access to sensitive former Soviet nuclear weapons design and fabrication information.”⁴⁴ Therefore, DOD focused on weapons facility security measures in the meantime. Even these efforts were troubled, as the Ministry of Defense (MOD) would not provide DOD with access to the interior of any weapons storage sites until 2003. Russian defense officials were even reluctant to provide details on the number of weapon storage facilities that would require upgrades.⁴⁵ Russian and American security priorities on the warhead dismantlement and proposed fissile material storage site were directly contentious during this period and were the two principal barriers to progress on weapons dismantlement. Warhead and delivery vehicle dismantlement were two of the main cornerstones of the DOD-

CTR program, and yet, by the end of the Bush administration, the Russian and American militaries had made little progress.

While the American and Russian militaries were putting forth an honest effort to cooperate in a mutually beneficial manner, the Department of Energy was less fortunate with its partner agency. DOE's partner, the Russian Ministry of Atomic Energy (Minatom), was much less cooperative than the military during the Bush administration. DOE's mission under CTR funds was to improve fissile material security at various Russian facilities. Naturally, the urgent proliferation concern—and therefore DOE's focus—was direct-use material, such as HEU and weapons-grade plutonium. Minatom, however, was not interested in providing access of any kind to direct-use material, stating that projects regarding security for low-enriched uranium (LEU) were more appropriate.⁴⁶

Personal Relationships between U.S. and Russian Counterparts

As the DOD and Russian MOD were struggling to work out their differences, the scientists of the national laboratories were making progress in bridging the American-Russian gap toward CTR objectives, even though their efforts were not part of any official program funded by Nunn-Lugar funds. In the 1980's, American and Soviet scientists began to work with one another in joint research projects aimed at solving technical issues related to the verification and transparency measures associated with arms control negotiations.⁴⁷ The scientists worked with each other over multiple projects and rounds of negotiations, at a very optimistic time for arms control experts. Eventually, they started to develop professional relationships with one another. These American scientists had watched the CTR agenda carefully after Secretary Baker and Russian President Boris Yeltsin announced the plans to create the International Science and Technology Center (ISTC) in Moscow on February 7, 1992.

The ISTC would be funded mostly by American, European, and Japanese support to provide funding and support for former Soviet weapons specialists. The center would fund several forms of projects, providing grants for individual and team projects consisting of former Soviet scientists and creating joint research between former Soviet and Western scientists. Through these projects and research grants, the U.S. and Russian governments attempted to provide short-term income to former Soviet weapons specialists. Long term goals included fostering a more welcoming environment in the Western scientific community for former Soviet specialists (for example by sponsoring scientific research symposia), and introducing former Soviet scientists to civilian applications of their skills.

However, the opening of the ISTC encountered several difficulties (explained in the following section: it was not officially opened until 1994), and the scientists of the American national laboratories asked for permission to step in and start issuing short-term research contracts for their weapon expert colleagues. The American scientists of Los Alamos, Sandia, and Livermore National Laboratories used their previous networks to reach the weapons experts—successfully—and this series of short term contracts, starting in 1992, eventually developed into a full-fledged program administered by DOE in order to provide substantive scientific employment and income to former Soviet weapon experts who may have otherwise sold their knowledge to other nations.⁴⁸ This program, officially created in 1994, was known as the Industrial Partnering Program (IPP), but was later re-named the Initiatives for Proliferation Prevention.

Domestic Political Pressures: Russia

The opening of the ISTC in Russia was more difficult than expected: despite the fact that Baker and Yeltsin signed the agreement to open the ISTC in May 1992, the legislation languished in the State Duma, the Russian parliament. The necessary American funds were readily available through the Nunn-Lugar legislation, but the project required Russian approval before the center could be opened in Moscow. As the Duma failed to act, Yeltsin stepped in and provisionally approved the ISTC agreement through a presidential decree in December 1993. The Duma still failed to produce results by this time, but Yeltsin's decree eventually enabled the ISTC to become operational. It began funding projects in March 1994.⁴⁹

The domestic environment in Russia was rather turbulent during the Bush administration. The political and economic situations were closely intertwined through the process of privatization and development of the market economy. However, these processes created difficulties in project cost estimates, especially in the DOD-CTR program, which were necessary to garner DOD approval. Difficulties in estimating the cost of projects translated to additional obstacles in demonstrable progress toward CTR goals.

While the majority of funds were provided by the U.S. government and allotted in U.S. dollars, any items procured or built in Russia, such as the aforementioned fissile material storage facility, would be purchased with Russian rubles. As Russia's economy struggled to move from a command to market economy, costs for many items changed frequently, and for the Russians (who provided cost estimates on their project proposals), rather unpredictably. In addition, privatization and price liberalization resulted in short-term economic chaos characterized by extremely high inflation rates. For example, a March 1991 estimate by Russian experts consisted of a request for \$150 million in aid for the construction the fissile materials storage facility. This estimate was later revised down to \$16 million. After such drastic price changes, the Army Corps of Engineers performed a study in order to project the cost of a similar facility if it were to be built in the United States—this value was projected at \$560 million.⁵⁰ Given the high inflation rates and difficulties of estimating a ruble cost (never mind transferring that to an accurate dollar amount), one can see the complications in preparing a proposal for U.S. Defense Department officials. For example, a proposal submitted to DOD officials in early January 1993 would include a cost section which cited a ruble-dollar conversion rate of 417:1 as of January 6. A few weeks later, by the time this proposal could realistically be approved, the conversion rate had changed to 568:1.⁵¹ Between January 6 and 27, the projected price of the project would have changed by 36%. Ruble costs and corresponding dollar amounts would need to be revised extremely frequently in order to keep up with inflation and convey accurate project costs. Needless to say, the dismal Russian economy during the Bush administration provided major difficulties in the project planning and budgeting process.

Incidence of terrorist attacks

Until the terrorist attacks of September 11, 2001, The U.S. government was largely not concerned with terrorist attacks in relation to CTR. It was always known that CTR projects were valuable prevention against potential terrorist activities, but the administration did not respond bureaucratically from any major incidents. What did catch the administration's attention, however, was an incident involving the theft of fissile material. In October 1992, police forces in Moscow arrested a group of car battery thieves as they were attempting to sell their illicit wares.

When they were taking the thieves into custody, the police made an incredible discovery: one of the perpetrators had 1.5 kg of HEU in his possession.⁵²

The man was later identified as a chemical engineer who had been working at the Luch uranium enrichment facility. At this plant, HEU is used in the production of nuclear fuel assemblies. This employee was aware of the facility's quality control measures, and began to repeatedly steal small quantities of HEU over a period of 5 months. He knew that limited differences between factory input and output would be contributed to "normal losses to waste."⁵³

In an interview featured in the film "Countdown to Zero," the Luch engineer was able to tell his side of the story: he was unable to keep up in the tough Russian economy and needed to find an alternate source of income. The engineer explained, "I just needed a new refrigerator and gas stove. My salary couldn't keep up with inflation, and I couldn't buy anything. I just wanted to buy a few essentials, then work honestly."⁵⁴ Despite the fact that this engineer attempted to sell HEU, which could be seen as supportive of terrorism, his main motivations were financial.

Just like the scientists from the Chelyabinsk-70 laboratory, many of the engineers, technicians, and workers of the former Soviet nuclear complex were suddenly left with deep salary cuts or no salary at all after their nation collapsed; in order to earn money, these workers, scientists, and engineers had to use the resources around them. These resources—the knowledge, materials, and infrastructure of the former Soviet nuclear complex—are potentially very lucrative. They also pose an extreme proliferation risk.

Although not considered a terrorist attack, this HEU interdiction was a clear indicator of the potential for terrorist groups to take advantage of the poor security measures in place at facilities around the FSU. Terrorists could steal direct-use material themselves, just as the engineer had done. In reality, the situation was worse, however: the facility had not known its HEU was missing until the engineer was caught; terrorists could already be stealing the direct-use material, and there would be no indication. As Rolf Mowatt-Larssen, a CIA operations officer from 1983-2005, stated in an interview, "We don't know whether it's the iceberg or the tip of the iceberg."⁵⁵

NATO expansion:

The USSR dissolved during President Bush's tenure in office, meaning that the Bush team negotiated with Soviet President Mikhail Gorbachev and, after the USSR disappeared, Russian President Boris Yeltsin. In February 1990, Bush, Gorbachev, and West German Chancellor Helmut Kohl had come to a consensus: NATO would not expand eastward. When Germany unified, it would become a full member of the alliance, but foreign troops would not be stationed on the territory of the former German Democratic Republic (East Germany). Baker stated to Gorbachev, "There would be no extension of NATO's jurisdiction for forces of NATO one inch to the east."⁵⁶ While this was a spoken agreement between these heads of state, the official agreement made in September 1990 did not mention the eastward restriction of NATO. Gorbachev did not secure Baker and Bush's promise in words in a signed document—leaving future administrations to approach the future of NATO in a much more flexible manner. During the Bush administration, the U.S.-Soviet negotiations on potential NATO expansion were resolved before the concept of CTR was raised in the Congress. The issue of NATO expansion was largely left alone until the Clinton administration took office in 1993.

The Clinton-Yeltsin Years: 1993-2000

The Clinton and Yeltsin administrations epitomized the strong influence of personal connections, domestic political climates, and bureaucratic structure on the U.S.-Russian relationship and CTR. In these early years of CTR, before a true bureaucratic momentum had been achieved in many CTR projects, U.S.-Russian cooperation to ensure CTR effectiveness was heavily dependent on senior-level attention. Levels of trust between bureaucratic bodies were still low in 1993, but achieved considerable improvement over the course of the Clinton-Yeltsin period. Without active encouragement from high-level management and two presidents who were unwaveringly dedicated to advancing the U.S.-Russian relationship, many aspects of CTR would have been dead on arrival. As a result, most major issues which dominated U.S.-Russian relations—and therefore the senior leadership of both nations—were counterproductive to the CTR mission.

The Domestic Situation in Russia: “The only horse to ride”

The first major factor which hampered CTR during the 1990’s was Russian President Boris Yeltsin’s domestic political standing. Especially in the early years of his presidency, Yeltsin’s position was truly compromised: as a democratic and market reformer, he faced serious opposition from nationalists and communists within the Russian parliament. The general populace of Russia was mostly concerned with the poor economic situation, which did not help Yeltsin’s standing, either. Yeltsin and his liberal reformers were constantly vulnerable to attacks from his communist and nationalist opponents; he feared that they would mobilize the Russian electorate based on the disastrous short term effects of market reforms and his close working relationship with the Americans—which the nationalists characterized as ‘capitulation to the West.’

Despite the bleak situation, Yeltsin was the only choice for American support. In a Senate confirmation hearing of Strobe Talbott to the post of ambassador-at-large and special adviser to the secretary of state on the new independent states of the former Soviet Union, Talbott defended the importance of providing economic assistance to Yeltsin in order to give him political stability. The Senate wholeheartedly agreed, with Senator Joseph Biden declaring Boris Yeltsin “the only horse to ride.”⁵⁷

It was widely understood that President Yeltsin’s political survival was equated with the survival of democratic and market economic reform in post-Soviet Russia. Thus, it was Yeltsin’s political survival, not CTR, which dominated the Clinton administration’s agenda when it came to Russian affairs. A considerable portfolio of highly contentious issues arose in U.S.-Russian relations during Clinton and Yeltsin’s tenure in the presidency, including the war in Bosnia, NATO enlargement, the situation in Kosovo, the war in Chechnya, and Russia’s ongoing nuclear relationship with Iran. These issues, including the top-down encouragement of CTR, all had to be managed amid several deep crises in Russia, including a terrible economy in the early 1990’s, a constitutional crisis in which the Russian White House was shelled, and a major financial crisis in 1998. While CTR was recognized as an important mission, the series of high-tension emergency situations in the 1990’s urgently captured the attention of both Russian and American leadership. Given a more stable situation both domestically in Russia and across the globe in the years shortly after the Cold War, U.S. and Russian leaders could have spent much more time in advancing their bureaucracies forward in a collaborative fashion to meet the goals of CTR.

Another major difficulty on the Russian side was the level of trust between the Russians themselves. Yeltsin soon learned that he could not trust even his own ministers—especially Viktor Mikhailov, the Minister of Energy and director of Minatom. This disloyalty to Yeltsin was particularly pronounced in the problem of Russian-Iranian nuclear cooperation, which was not only increasing in its civil capacity, but was becoming a flagrant proliferation threat. Mikhailov was actively avoiding his own country's export controls, blocking legislation for new controls, and attempting to sign deals with the Iranian regime without the knowledge of Yeltsin. Apart from agreeing to build up to four nuclear reactors in Iran, Mikhailov also attempted to sell gas centrifuges to the Iranians, with which the regime could produce HEU.⁵⁸

While the senior leadership was caught up in deliberating over NATO expansion, this problem of nonproliferation affairs was festering behind the scenes from the Russian side, which negotiators in DOE became aware of but could not prevent. Russia's continued support of the Iranian nuclear complex was a concern over which the nonproliferation officials in Washington and Moscow had been arguing extensively. This issue required a presidential intervention. After Talbott and Georgi Mamedov (Deputy Minister of Foreign Affairs for Arms Control) asked their presidents to step in and resolve the issue, it was swiftly settled at the next presidential summit. Yeltsin pledged to ban the transfer of centrifuges to Iran, among other controls limiting the Russian-Iranian nuclear relationship. Clinton and Yeltsin then agreed to publically announce that Russia would give no nuclear technology with military application to the Iranians.⁵⁹ This quick exchange between presidents at one summit meeting illustrated the power for high-level leadership to facilitate cooperation among governments by removing impediments to their mission (that the bureaucracies could not solve themselves), such as Mikhailov's assistance to Iran.

NATO Expands Eastward, and into U.S. and Russian Politics

The topic of NATO expansion proved to be a complex and troublesome issue for the Clinton administration—one which demanded an extraordinary amount of high-level attention and served not only as a distraction from directing and coordinating CTR programs, but also as an irritant between the U.S. and Russian militaries. While the topic was highly sensitive for U.S.-Russian relations and the post-Cold War European security environment, it also became a key domestic issue in both countries, particularly prior to the 1996 presidential elections in the U.S. and Russia.

The political environment of the United States was pushing hard for enlargement, while Russian politicians were furiously opposed. Yeltsin's political survival, which, at some points, was hanging by a thread, was inextricably linked to the issue of NATO enlargement. Yeltsin's most powerful and vocal opponents included communists and die-hard nationalists who would rebrand NATO enlargement as the West 'encircling' Russia. In the years of Yeltsin's presidency, the Russian populace viewed NATO enlargement as the ultimate triumph of the West over Russia and evidence of Western hostile interests. In a presidential summit in May 1995, Yeltsin suggested a "pause" on NATO enlargement until 2000—when Clinton informed him that he could not wait until then, Yeltsin pleaded that enlargement be stalled "at least until we get through our elections so that, between now and then, there's only a theoretical discussion about enlargement. I've got to tell you, my position heading into 1996 is not exactly brilliant. I have to look for positive developments and do anything I can to head off negative ones."⁶⁰

NATO enlargement was a threatening concept to the Russians both politically and militarily. Russian Deputy Defense Minister Andrei Kokoshin warned Secretary of Defense William Perry that any enlargement prior to the 1996 presidential election would be viewed by the Russians as “rolling over Russian objections like a tank.”⁶¹ As Talbott summarized, in that case “the two of them [would] need not waste their time on defense conversion: Russia would throw itself into the task of turning plowshares back into swords.”⁶² In other words, NATO expansion would convince the Russians of the need to re-arm, not disarm. NATO enlargement plans, it seemed, were directly threatening the weapons dismantling process, a cornerstone of the CTR agenda.

As Kokoshin warned, the Russian Duma reacted poorly to the prospect of Russia’s former adversary expanding eastward. Chairman of the Duma Committee on Foreign Affairs Vladimir Lukin stated,

*“There are considerable questions as to how we would ratify START II when the political situation in Europe has changed and when there is a chance the biggest military machine in the world will move closer to our borders. We would not be able to explain this paradox to the Russian people.”*⁶³

In fact, the Duma continually postponed ratification of the START II treaty until 2000.

NATO enlargement plans undoubtedly created a political uproar in Russia during the Clinton-Yeltsin years, but progress in weapons dismantlement and materials security upgrades in Russia at this time appeared to remain insulated to its effects. Despite the Russian politicians’ rhetoric, significant breakthroughs occurred in threat reduction negotiations during this time. While the Duma decided to postpone ratification of START II, this arms control agreement was not officially part of the CTR program agenda.

In spite of the Russian threats to end the CTR projects over NATO issues, the DOD continued to operate with success, particularly through improvements in transportation security. According to a June 1995 GAO report, DOD-CTR delivered 4,000 armored blankets to the Russian MOD between July 1992 and June 1993. The Russians reported that the blankets immediately went into use protecting warhead shipments from Kazakhstan and Ukraine. By October 1994, the DOD-CTR program finished shipping 115 rail car security upgrade kits for transporting warheads. Due to budgeting issues between the MOD and Russian government, not all of these kits were installed by the time this report was published, although the Russians described the “funding shortfall” as “remedied.”⁶⁴

DOD progressed in its CTR mission outside of Russia as well. Following the trilateral accord (discussed below), warheads began their transfer from Ukraine to Russia in early 1994. The warheads were delivered on a regular schedule to a dismantlement facility in Russia. By January 1995, a little under a year after the signing of the trilateral accord, 40 SS-19s were removed from their silos, and the warheads were removed from Ukraine’s entire arsenal of SS-24s. By April 1995, 40 percent of Ukraine’s warheads were transferred to Russia.⁶⁵

According to the GAO report, Ukraine lacked the necessary resources and infrastructure to dismantle its 176 delivery vehicles and missile silos. DOD-CTR’s backbone support provided Ukraine with the capability to dismantle its ICBMs and strategic bombers, in accordance with the Lisbon Protocol and trilateral accord. By March 1995, the value of DOD-CTR’s work in Ukraine surpassed \$52 million.⁶⁶ Despite the political problems NATO enlargement caused, CTR projects continued successfully.

In Washington, on the other hand, Clinton was under pressure to move forward decisively with NATO enlargement. In the midterm elections of November 1994, the Republican

Party gained control of both houses of Congress. In the Republicans' platform, known as the Contract with America, there were few foreign policy items—but NATO enlargement starting early in 1995 was one of them.⁶⁷ This substantial setback for the Democrats meant that Clinton was under strong political pressure to be firm with Russia. In his book, Not Whether But When: the U.S. Decision to Enlarge NATO, Dr. James Goldgeier noted that President Clinton faced a difficult balancing act in the face of his own reelection campaign. While attempting to support Yeltsin's chances for reelection as much as possible, Clinton could not be seen as "too soft on Russia" or "caving to Russian threats," otherwise the Republican opposition "would be swift to accuse him of being weak and of holding the Central Europeans hostage to Moscow's interests."⁶⁸

Program Funding and the Contract with America

Clinton and Yeltsin succeeded in their delicate balancing of American and Russian domestic interests, which at this time were contrary to one another. NATO enlargement nominally proceeded forward with the Partnership for Peace program and an enlargement study in 1995, while formal invitations were not issued to the Czech Republic, Hungary, and Poland until 1997, after the elections.⁶⁹ However, the Republicans, particularly those in the House of Representatives, did in fact punish President Clinton for his Russia policy by reducing appropriations for the DOD-CTR program. Despite DOD's progress, the Republicans in the House Armed Services Committee (HASC) attempted to undercut DOD's ability to perform its CTR mission in Russia and the FSU in the fiscal year (FY) 1996 National Defense Authorization Act. In addition to a few programs it wished to end, the HASC raised concern over the lack of oversight DOD was placing on the funds spent for DOD-CTR. In particular, the HASC denied the authorization of funds toward the fissile materials storage facility in Russia and the Demilitarization Enterprise Fund (one of the projects for former Soviet scientists to apply themselves to civilian projects while earning a wage). Based on a \$371 million budget request, the HASC reduced funding to \$200 million. The recommendation vaguely cited GAO documents reporting "that [DOD-CTR] funds may have been provided to institutions and individuals in Russia who remain involved in ongoing work on weapons of mass destruction. Accordingly, the extent to which there is a direct causal relationship between the [DOD-CTR] program and ongoing dismantlement and destruction activities in the states of the former Soviet Union is difficult to verify with certainty."⁷⁰ The Senate, on the other hand, approved the Clinton administration's requests for FY1996, and the House compromised for \$300 million.

Despite the decrease in funding for the DOD-CTR program orchestrated by the HASC for FY1996, funding for CTR projects across the U.S. government as a whole for that fiscal year increased. This was the result of several bureaucratic restructuring shifts in official budgeting responsibilities: the Materials, Protection, Control, and Accounting (MPC&A) Program—in which security cameras, intrusion detection, and computerized inventory systems, among other security measures, were installed at facilities to increase fissile material security—officially transferred to the DOE with a budget of \$70 million. \$33 million was authorized for the State Department, which officially took over responsibility for the ISTC program.⁷¹ DOD-CTR was no longer the only program funded by Congress. One important characteristic of this change was that funds for CTR projects as a whole now came from various sources—the defense authorization budgets and the energy and water authorizations.

Under the Clinton administration, CTR program budgets increased drastically, as the scope and identified project portfolios of these programs expanded. The MPC&A budget, for example, started at less than \$3 million in FY1993 and ended at \$169 million in FY2001. MPC&A's budget sharply increased starting in FY1995 due to new projects identified, and finally, by FY1996, the Clinton team could announce a significant step forward in negotiations in which DOE gained authorization to apply its program specialists to a much larger number of facilities than before (see "Breakthrough at Building 116" section). This break from the past meant that the MPC&A program had an immense amount of work to accomplish—and its subsequent budget increases reflected this.

The Trilateral Accord

During the Bush years, Ukraine and Russia had both signed the START treaty and the Lisbon Protocol, indicating that Ukraine intended to disarm by 1999. The implementation details of this transfer of weapons from Ukraine back to Russia had not been agreed upon, however; negotiating this agreement fell upon the responsibilities of the Clinton administration. On May 10, 1993, Strobe Talbott met with Leonid Kravchuk in order to discuss implementation of the Lisbon Protocol. In exchange for returning the missiles to Russia, Kravchuk demanded \$2.8 billion in Nunn-Lugar funds, \$5 billion in HEU compensation for the tactical weapons that Ukraine already returned, and a security guarantee from the United States that would essentially equate it to full NATO membership.⁷² Talbott calmly informed Kravchuk that all this was impossible, proposing a counter-offer of millions, not billions, in financial assistance. Talbott also said he would work toward garnering security assurances from Russia. It was clear that the United States, Russia, and Ukraine each had drastically different expectations for the conditions under which the Lisbon Protocol would be implemented. Talbott ended the meeting with a suggestion that these issues be negotiated in a trilateral setting including Russia.⁷³

As Ukrainian and Russian teams were attempting to negotiate compensation for the warheads, Talbott and Mamedov convened a bilateral U.S.-Russian body consisting of American and Russian teams of defense and intelligence officials. This body became known as the Strategic Stability Group, and served as the primary channel for the U.S. and Russia to jointly brainstorm prior to the trilateral negotiations with Ukraine. Using Talbott's counter-proposal to Kravchuk as a starting point, the Strategic Stability Group agreed on three core terms of what would eventually become the trilateral accord: the United States would provide financial and technical assistance (through CTR funds) to both Russia and Ukraine, and Russia would pledge to honor Ukraine's independence and sovereignty. In addition, Talbott and Mamedov came up with an idea to force Ukraine to act in deliberate steps toward disarmament during the transit process: Ukraine would deactivate all of its warheads prior to their transit to Russia.⁷⁴ They felt that a step-by-step process would be easier to get in motion.

Russia, Ukraine, and the United States signed the final trilateral accord in Moscow on Jan 14, 1994. The Ukrainians agreed to the return of all nuclear weapons to Russia in a phased, step-by-step process. Within a period of 10 months, all SS-24s would be deactivated and 200 warheads would be returned to Russia. The last warheads would be transferred by June 1st 1996, and Ukraine would accede to the NPT as a non-nuclear weapon state at that time. Russia compensated Ukraine for its strategic warheads with 100 tons of nuclear reactor fuel rods (containing LEU); compensation for the HEU originating from the tactical weapons was provided by Russia by forgiving some of Ukraine's natural gas debt. Russia extended its security

assurance, and the United States agreed to underwrite it. Finally, the U.S. agreed to financial assistance to both Russia and Ukraine, \$100 million of which would be immediately released to Ukraine upon signature of the accord. The U.S. paid \$60 million to Russia to compensate for its delivery of nuclear fuel.

Personal Relationships between U.S. and Russian Counterparts

Personal connections between the Russian and American leadership were crucial during the Clinton-Yeltsin years: close working relationships allowed American and Russian counterparts to be frank with one another and work in a cooperative problem-solving manner through many tough issues such as NATO expansion, implementing agreements on Ukraine's dismantlement, and Russian nuclear assistance to Iran. These relationships allowed Russian and American counterparts to see beyond the deep-seated mistrust of their nations' populaces and work collaboratively. In particular, the partnership between Strobe Talbott and Georgi Mamedov proved to be invaluable for keeping U.S.-Russian relations on the firmest footing possible. This relationship also was instrumental in successfully signing the trilateral accord.

Under President Clinton, Strobe Talbott served as ambassador-at-large and special adviser to the secretary of state for the new independent states of the former Soviet Union, later becoming deputy secretary of state in early 1994. Under President Yeltsin, Georgi Mamedov was deputy foreign minister for U.S.-Russian relations and Arms Control. As Talbott was entering service in the State Department, Dennis Ross (a close aid of Secretary Baker) highly recommended that Talbott become acquainted with Mamedov as soon as possible. Ross described Mamedov as the "ablest, shrewdest, and most creative diplomat on the Russian side." Ross added, "he's in the solution business."⁷⁵ As the Clinton and Yeltsin administrations worked through the many obstacles related to CTR, Ross was proven right.

In Talbott's meeting with Ukrainian President Leonid Kravchuk in May 1993 regarding implementation of the Lisbon protocol, Talbott invited the Ukrainian deputy foreign minister to a three-way negotiation with Mamedov and himself. Talbott was somewhat worried; even though he knew it would appeal to Mamedov as an effective measure to work out the implementation issue with the Ukrainians, Talbott had just volunteered a foreign diplomat for a set of meetings he had never heard of—and Talbott had only met Mamedov briefly, in two short meetings.⁷⁶ Despite his lack of advanced warning, Mamedov was of a similar opinion and accepted his forced invitation without any complaints.

Mamedov also provided Talbott with candid advice on Ukraine's disarmament from his unique Russian perspective. He said,

*"Those people you're dealing with in Kiev will resent your taking away the strongest card in their hand and many on our side will resent your meddling in something that they believe is none of your business. Remember anything between us and the Ukrainians is a family affair, and any disagreement we have is a family feud."*⁷⁷

Mamedov imparted some critical opinions to Talbott, helping him to understand both the Ukrainian and Russian perspectives prior to their trilateral negotiations. Frank exchanges such as these are signals of true intent to actualize mutually beneficial outcomes; discussions that are concise, candid, and productive are indicative of being in the 'solution business.'

Just prior to the signing of the trilateral accord in Moscow, Mamedov also proved his indispensable value as Talbott's diplomatic counterpart. At a large reception at American Ambassador Thomas Pickering's residence, Mamedov pulled Talbott aside and informed him

that Minister of Atomic Energy Viktor Mikhailov was attempting to scuttle the trilateral agreement. Mikhailov was allegedly unsatisfied with the accord's safeguarding procedures outlined for the warheads prior to their delivery to Russia, and he was planning on raising questions to Yeltsin before the signing ceremony. Together, Mamedov and Talbott figured the best way to ensure the process continued smoothly was to have Clinton engage Yeltsin in an intense private session. Clinton had already solved several problems with Kravchuk and a few of his advisers around him, who also wanted to spoil the deal. Mamedov and Talbott carefully designed a quick-hitting personal appeal from Clinton to Yeltsin in order to prevent Yeltsin from listening to his own minister of atomic energy.

Clinton would recount his episode with Kravchuk, explaining how he was shamed by the potential collapse of the deal; Clinton added that Kravchuk now understood that he couldn't let his government spoil the deal, and that "he owed it to both Clinton and Yeltsin" to resist the spoilers. Clinton finished by assuring Yeltsin of the firm intention of the United States to follow through in monitoring the implementation, "making sure that both of its partners' interests were protected."⁷⁸ Clinton excelled in his delivery and the agreement was signed without any further issues.

The personal connection between Talbott and Mamedov proved to be an invaluable one; this team was able to work through difficult issues and reach reasonable solutions in extraordinarily short time frames, even if it meant working against their own bureaucrat colleagues in the name of U.S.-Russian cooperation. Talbott and Mamedov's work—in the bilateral Strategic Stability Group, trilaterally in negotiations with the Ukrainians, and alone between the two of them—saved a potential disaster in both the negotiations and final signature of the trilateral accord.

This agreement between the U.S., Ukraine, and Russia was a critical and sensitive issue in CTR because it involved the transfer over a thousand of nuclear weapons and had to be brokered between Russia and another former republic of the USSR. The follow-through, guaranteeing implementation of the Lisbon Protocol, was a major step forward in consolidating the former Soviet arsenal, and eventually resulted in Ukraine's complete transfer of all nuclear weapons to Russia by June 1st, 1996. In large part due to Talbott and Mamedov's teamwork, Ukraine's disarmament—a move from possessing the third largest nuclear arsenal in the world to becoming the newest NPT signatory as a non-nuclear weapon state—proceeded past the political signatures of the Lisbon Protocol and became reality.

Bureaucratic Structure

The most important and influential aspect of the Clinton administration's bureaucratic structure that affected its approach to CTR was the U.S.-Russian Joint Commission on Economic and Technical Cooperation, better known as the Gore Chernomyrdin Commission (GCC). Although originally created primarily as a mechanism for economic cooperation, the GCC eventually expanded to include many fields, ranging from business development to defense conversion to health. The GCC proved to be instrumental in the Clinton administration's progress in engaging Russia on CTR, bringing both bureaucratic leaders and political weight behind one institution.

Clinton suggested the idea of a bilateral group co-chaired by Vice President Al Gore and Prime Minister Viktor Chernomyrdin at their first summit meeting in Vancouver in April 1993. The goal was to create a bilateral forum through which to discuss many the topics of cooperation

that each president envisioned for the U.S.-Russian relationship. Although President Clinton officially suggested it, Russian Foreign Minister Andrei Kozyrev originally introduced the idea to Strobe Talbott.

Kozyrev, lacking confidence in his government's willingness to collaborate with the United States, wanted to "'institutionalize' the concept of partnership."⁷⁹ Kozyrev's proposal was designed for 2 purposes: political palatability in Russia and the development of a collaborative culture toward the U.S. in the Russian government. Kozyrev chose Chernomyrdin as the Russian co-chair due to his relatively high level of popularity across the Russian parliament in comparison to Yeltsin. This decision was meant to increase the Duma's comfort with the U.S.-Russian body, and, at a minimum, attempt to dissuade the Duma from undercutting its legitimacy, as it had repeatedly attempted vis-à-vis Boris Yeltsin. Second, Kozyrev knew that economic assistance from the West, especially from the United States, would be "politically more palatable in Russia—less like 'patronizing charity'—if it were put in the framework of U.S.-Russian cooperation."⁸⁰ Finally, he knew that the best way to engage his government as a whole would be to sway his boss, the prime minister. Including Chernomyrdin as the co-chair would be a good method of ensuring that the prime minister developed "a personal stake in the American connection."

Strobe Talbott immediately saw the brilliance in placing a bilateral cooperation vessel in the hands of a high level Russian official other than Yeltsin. Yeltsin's frequent leaves of absence due to his alcohol consumption and poor health detracted from his ability to lead the Russian Federation; in Talbott's view, placing Chernomyrdin in charge of the Commission would help to buffer U.S.-Russian cooperation from these inconsistencies. Due to Yeltsin's "erratic streak," Talbott saw the Clinton-Yeltsin connection unreliable at times. He described it as an "uncertain flywheel in the machinery of U.S.-Russian relations."⁸¹ In fact, choosing Chernomyrdin as the chair was a well-advised move: starting with the first presidential summit between Yeltsin and Clinton in Vancouver, "keeping count of Yeltsin's [alcohol] intake was to become a standard feature of summitry."⁸² This critical decision to place Chernomyrdin as the Russian co-chair meant that the GCC, and its CTR negotiations in the defense conversion and energy committees, received adequate and consistent support from the Russian side. The GCC was a novel idea in U.S.-Russian relations. It was well-designed from a political standpoint, but its structure also contributed to its capacity to obtain constructive results in advancing CTR talks and their associated projects.

The GCC's format was its first key characteristic that contributed to successful cooperation between the United States and Russia in threat reduction initiatives. While separate committees met on their own schedules, full plenary sessions of the GCC, chaired by Gore and Chernomyrdin, were held every 6 months, alternating between American and Russian locations.⁸³ The 6 month timeframe struck a balance between committee independence and pressure to provide deliverables. Intervals of 6 months between plenary sessions ensured that committees had enough time to perform significant progress and work through ambitious negotiations. On the other hand, the plenary group met often enough to pressure committees into displaying deliverable progress on a regular basis.

In addition, the high level political nature of the GCC contributed to its productivity. First, Gore's co-chairmanship and Clinton's continuing interest in the GCC's progress ensured that significant pressure could be placed on all participating American committees to produce results. This effect led to more business-like negotiations and less tolerance for emotionally charged or stereotype-based attitudes on the American side among colleagues. Kenneth Luongo,

former nonproliferation advisor to Energy Secretary Hazel O’Leary and active participant in all GCC energy meetings, described Gore and Clinton’s influence as “significant drivers” to the GCC’s progress.⁸⁴

Second, the high-level political nature of the GCC allowed it to become an effective mechanism for overcoming the roadblocks to success. In some cases, the bureaucratic working-level individuals simply didn’t have the political weight to fix these issues. Matthew Rojansky, deputy director of the Russia and Eurasia Program at the Carnegie Endowment for International Peace, notes that due to the state of U.S.-Russian relations in the early 1990s, any ministerial-level cooperation would “require significant high-level management to jumpstart working-level engagement, as the bureaucracies in Moscow and Washington had not had much working level contact before.”⁸⁵ The GCC structure provided the required high-level management for this political support.

Kenneth Luongo agrees with Rojansky, adding that analogous pressure on the Russian side served as incentive to open previously secret facilities for inspection and to deliver on projects that were already identified. If Gore and Chernomyrdin had already signed off on a particular project agreement, ministerial level officials could not block this progress even if they so desired. Doing so would eschew this official from both collaborative-minded government figures and those who were more traditionally skeptical, due to Chernomyrdin’s signature.⁸⁶

Finally, the GCC’s structure contributed to effective negotiation between U.S. and Russian delegations due the pairing of ministerial-level and working-level groups. Corresponding committees contained individuals with political authority within particular agencies as well as scientific professionals who could work out specific technical details. Among its working committees were defense conversion, energy, and science and technology. Defense conversion, chaired by U.S. Secretary of Defense William Perry, Russian First Deputy Minister of Defense Andrei Kokoshin, and First Deputy Minister of the Economy Valeriy Makhailov, was instrumental in negotiating and contributing to matters closely related to the DOD-CTR program. The energy and science/technology committees were more helpful to the programs that improved nuclear materials security, such as MPC&A and others administered by DOE. Kenneth Luongo stated that one of the invaluable characteristics of the GCC was the avenue for American and Russian technocrats to interact and work with one another. Scientists from various national laboratories, who understood the gravity of the security crisis in the FSU, were able to gain rapport, mutual respect, and trust with their American counterparts after working with them face-to-face over an extended period. These relationships in particular would lead to one of the most significant advances in U.S.-Russian CTR collaboration.

Breakthrough at Building 116: Level of Trust between Bureaucratic and Military Bodies

The U.S.-Russian post-Cold War environment was highly susceptible to thinking in stereotypes and highly skeptical viewpoints of one another, particularly when it came to nuclear weapons. For example, even when discussing U.S. efforts in finalizing the trilateral accord—the implementation agreement that would facilitate the transfer of nuclear weapons from Ukraine to Russia—Russian officials outwardly expressed extreme sensitivity and insecurity vis-à-vis the United States. Yevgeny Primakov, then serving as head of Russian intelligence services, suggested that America’s true motive in granting a “generous offer of assistance” was enticing Ukraine into a group of nations led by the U.S. that would “encircle Russia with our former fraternal republics and allies.”⁸⁷ However, statements like these were not representative of the

entire Russian side; eventually, the scientists working together on the GCC in the energy and technology committees were able to set aside their differences and work together.

Prior to 1995, Viktor Mikhailov and the officials at Minatom were the dominant authority on the Russian side of any talks regarding security at any civilian locations, including fissile material storage sites and nuclear reactors. In addition, Mikhailov oversaw the weapons design labs at Chelyabinsk-70 and Arzamas-16.⁸⁸ This all changed in January 1995, when Yevgeny Velikhov, the director of the Kurchatov Institute, approved a plan in which his technical team (some of whom had connections to the GCC energy committee) invited the Department of Energy to start a MPC&A pilot project at their facility.

After the Russian technocrats felt comfortable enough with the American scientists, the decision to invite DOE was made internally at the Kurchatov Institute. For Kenneth Luongo, the decision turned out to become an incredible development. One day, American lab scientists arrived at Luongo's DOE office informing him of the message they received from the Russians at Kurchatov. As a member of the energy GCC committee, Luongo had been trying to convince Minatom for an extended period to allow Americans access to facilities storing direct-use materials to no avail. Minatom had only allowed access to LEU reactor facilities – sites that presented little proliferation threat compared to the sprawling inventories of direct-use material like Mayak. In response to previous appeals to the Russians to allow access to direct-use facilities in order to improve their security, Minatom had been protesting based on the same script for over a year: inclusion of direct-use material was a “sensitive and delicate issue.”⁸⁹ Minatom assured DOE that experience securing LEU sites would be a necessary prerequisite before expanding any CTR projects to direct-use facilities.

After hearing the news that this could potentially change, the proposal immediately caught Luongo's attention. “It looked like a real opportunity,” he said: this was something that had not been done before. With Mikhailov at the head of Minatom and Minatom being the powerful force behind all MPC&A affairs on the Russian side, American access to direct-use material in Russia was previously thought to be simply impossible at the time.⁹⁰

Luongo invited representatives from the Kurchatov Institute to Washington to discuss their proposal. At a follow-up meeting in Moscow, Luongo had made the necessary arrangements to raise this subject at the GCC energy committee. By the next plenary session, the Kurchatov proposal had already been signed by Gore and Chernomyrdin as a new GCC deliverable, and the plan to expand MPC&A to direct-use material in Russia was as good as set in stone. “At that point, it was inevitable,” Luongo remembers. Not even Mikhailov could block this one—his boss had already approved it.⁹¹

The scientists at the Kurchatov Institute took advantage of a unique combination that had not existed before: a bureaucratic structural opportunity to circumvent Mikhailov, and the necessary rapport between Russian and American scientists. In the bureaucratic reshuffling shortly after the collapse of the USSR, the Kurchatov Institute—one of the premier nuclear research facilities in Moscow—was taken out from under Minatom's authority and established as a semi-autonomous unit. In addition, the plan benefitted from the one who provided its approval. As Kurchatov Institute President, Yevgeny Velikhov is a well-established scientist with significant influence in the Russian nuclear physics community; once the scientists at Kurchatov showed Russia that this was possible, it served as proof to other Russian scientists and facility directors that allowing the American MPC&A teams to improve security at their sites was something serious to consider.⁹²

The pilot project at the Kurchatov Institute significantly improved security at the facility. The research center held about 80 kg of HEU in Building 116, which at the time was housing HEU intended for application in the Russian space program. This material was to become the first direct-use fissile material secured by DOE in Russia.⁹³ The DOE MPC&A team installed a new fence around the exterior, sensors, a television surveillance system to detect intruders, a nuclear material portal monitor, a metal detector at the facility entrance, improved lighting, alarm communication and display systems, an intrusion detection and access control system in areas where the nuclear material was stored, and a computerized material accounting system.⁹⁴

Following the pilot program at the Kurchatov institute, DOE was allowed to demonstrate a model material control and accounting system at Arzamas-16, a Minatom nuclear weapons laboratory. In addition, DOE sent MPC&A teams to work on Chelyabinsk-70, Arzamas-16's main competitor in the heyday of weapons design in the USSR.⁹⁵ January 1995 served as the critical breakthrough: after its pilot project at the Kurchatov Institute, the GCC energy committee was able to leverage agreements allowing American MPC&A upgrades at multiple direct-use storage facilities. Now the Americans could actually work to prevent thefts like the one that had occurred at Luch in 1992.

Incidence of terrorist attacks: 1994, Year of the Smuggler

While there were a significant number of terrorist attacks in Russia during the Clinton-Yeltsin years, mostly executed by Chechen rebels, the illicit activities that truly motivated the Clinton team were instances of theft, trafficking, and sales of fissile materials. When Senators Nunn and Lugar brought their CTR concept into the political discussion, they were aware that such risks existed. Von Hippel's examinations at the Kurchatov Institute and Mayak took the next step in confirming the vulnerability of the former Soviet nuclear complex, to a chilling degree. However, the influx of fissile materials theft and smuggling cases that took place during the Clinton years proved that the problem was not theoretically threatening; it was already happening, both inside and outside the FSU.

In March 1994, three men were arrested in St. Petersburg, attempting to sell just over 3 kg of HEU enriched to 90% (roughly 12% of the amount required for an IND). They managed to smuggle the material out of its facility simply by hiding it in a laboratory glove.⁹⁶ The smuggling incidents were not confined to the area of the FSU, however.

Two cases in Germany and one in Prague quickly showed how easily the material could be smuggled out of the territory of the FSU and through border security into the Western world. In May 1994, German police discovered 5.6 grams of highly purified plutonium while searching the home of a German businessman suspected for counterfeiting.⁹⁷ The discovery was completely serendipitous—the perpetrator was suspected only for counterfeiting, and until its discovery in the suspect's home, no connection to fissile material was known of.⁹⁸

One month later, another seizure was made in Munich. German authorities conducting a sting operation arrested a Colombian citizen as he disembarked from a flight from Moscow and confiscated his briefcase, which contained 560 grams of mixed-oxide fuel, 363.4 of which were 87.6% pure Pu-239.⁹⁹

In December, law enforcement officials in Prague confiscated 2.72 kg of HEU.¹⁰⁰ Unlike the Munich sting, the seizure was not made in transit – the material had already been sitting in Prague for months, while the smugglers attempted to identify a potential buyer. Another concern was raised from the Prague incident: varying police reports claimed that the guilty parties had

stored 3.3-6 kg of HEU in Prague, based on negotiations with the suppliers during the sting operation.¹⁰¹ Having only found 2.7, the police had no way of knowing whether there was any more material hidden in other locations.

When Matthew Bunn began working at the White House Office of Science and Technology Policy in January 1994, he was furious with the slow pace of nuclear security initiatives in the FSU. At the time there were “one or two pilot projects in Russia over several years” intended to teach Russian scientists proper fissile material securing techniques. These programs did not even deal with direct-use material: at the time, in 1994, Minatom only allowed DOE to assist with LEU projects. Bunn vigorously protested, “We haven’t *got* several years, the thefts are happening *now*!”¹⁰²

1994 in particular was a shocking year for the Clinton team: 4 cases of fissile material smuggling had surfaced, 3 of which occurred outside the territory of the FSU. Kenneth Fairfax cabled Washington from Moscow in response to the June Munich interdiction, in order to provide a survey of the fissile material security situation in Russia. Fairfax’s cable provided a grim characterization of a country suffering from dismal security lapses. After describing credible and efficient control and accounting of direct-use material (and thus the ability to track down potential thieves) as a primary deterrent for theft, he wrote, “what passes for MC&A [materials control and accounting] in Russia is an archaic paper-based system of receipts and seals.”¹⁰³ The fissile material interdictions—particularly the smuggling incident at the Munich airport—and Fairfax’s responses to it, galvanized the Clinton White House, particularly its Office of Science and Technology Policy, into action. Matthew Bunn remembered that at his office, “we were going crazy worrying about this stuff through much of 1994.”¹⁰⁴

An effort was made to quickly identify the most vulnerable fissile material storage sites in Russia, plan diagnostic visits, and begin negotiations on security upgrades. Fairfax sent a cable to Washington, in which he indicated the top 4 facilities that were his “best guesses on where to look” to locate the stolen fissile material’s origins.¹⁰⁵ These diagnostic visits started with von Hippel’s aforementioned visit to the Mayak facility in October 1994. Despite Minatom’s resistance, U.S. officials continued to push for security upgrades, especially on the sites that Fairfax expressed particular concern. Bunn worked with the Energy GCC committee, suggesting two separate approaches in 1994 to address direct-use materials. Both were rejected by the Russians.¹⁰⁶ Finally, after the breakthrough with the semi-independent Kurchatov Institute in January 1995, U.S. negotiators quickly took advantage of the opportunity and expanded the agreements to include their top-priority storage facilities.

The Bush-Putin Years: 2000-2008

During the Bush-Putin years, CTR programs had already been established for a few years and had gained some bureaucratic traction and momentum. The prior achievements that American and Russian delegations had reached regarding CTR issues had already laid an extensive groundwork for effective U.S.-Russian collaboration. The administration of George W. Bush inherited a much healthier working relationship than his predecessor when it came to CTR matters. The main questions asked during the Bush-Putin years regarding CTR were not inquiring whether or not the Americans and Russians could cooperate – academics instead speculated whether or not designated U.S.-Russian CTR projects and programs would complete their work in scheduled projects.

This momentum that came about during the end of the Clinton administration allowed CTR programs to survive and operate despite encountering rough patches in U.S.-Russian relations and a deteriorating presidential relationship during Bush and Putin's terms. Political situations that would have jeopardized CTR's success during the Clinton-Yeltsin years were less effective in derailing a CTR framework that was more highly institutionalized at this point. Especially after the attacks of September 11, the U.S. and Russia engaged closely in cooperating on counter-terrorism initiatives, many of which were CTR-related.

Program funding

The Bush administration sent a clear message in its attitude toward CTR spending with its first budget request in FY2002, when program funding levels were drastically cut. Even in situations in which the executive branch departments were asking for more funding, George W. Bush's team sent significantly reduced budget requests to Capitol Hill. These CTR programs were trimmed and were nearly forced to abandon entire projects due to the funding cuts proposed by the Bush team. The Congress eventually fought back against the cuts and in most cases provided more funds than the administration requested.

By the time President George W. Bush took office in January 2001, DOE had identified 332 buildings in the former Soviet Union that required security upgrades through MPC&A assistance. By January 2001, DOE had provided upgrades to 115 of these facilities, securing 32% of the nuclear material DOE had identified.¹⁰⁷ Despite DOE's request to the White House Office of Management and Budget (OMB) for over \$200 million, the Bush administration reduced this amount in its budgetary request to \$138.8 million. The Congress disagreed with this decision, and voted to return MPC&A funding back to the FY2001 level of about \$175 million.

President Bush also decided to cut funding for the Nuclear Cities Initiative (NCI), a program through which employees and residents of the nuclear industrial complex in Russia's closed cities are engaged to transition to civilian employment. After the Clinton team expanded NCI to include 3 of these closed cities, Bush cut the budget request down to \$6.6 million in FY2002. This amount would necessitate the program from ceasing the administration of projects in 2 of the 3 participating closed cities.¹⁰⁸ Once again, the Congress disagreed with this decision and decided to provide more funds to the NCI program than the administration asked for.

After the terrorist attacks on 9/11, Congress passed the Emergency Supplemental Appropriations Act for Recovery from and Response to Terrorist Attacks on the United States. This additional funding, taking place during FY2002, raced to replace many of the funds cut by the administration in CTR programs, particularly in the NCI and Initiative for Proliferation Prevention programs, which received \$15 million on top of their \$42 million appropriation (these programs were merged together under the name 'Russian Transition Initiative,' thus receiving one appropriation). In subsequent years, the threat posed by terrorism and WMD terrorism encouraged the administration to request more substantial amounts, returning to the trend of increasing budgets year by year.¹⁰⁹ However, Congress' efforts at increasing CTR funding were more extensive than the administration's. In addition, Congress authorized the expenditure of CTR funds outside the former USSR totaling \$50 million in unspent resources starting from FY2004. This represented one facet of the globalization trend within the CTR agenda that the Bush administration galvanized in the wake of the 9/11 attacks.

Finally, the Bush team engaged international partners (other than Russia and other FSU nations) to assist in funding for CTR projects in the FSU. At the 2002 G8 summit in Canada,

Bush proposed the “10+10 Over 10” plan, in which the United States would pledge to fund \$10 billion over 10 years for CTR projects. Bush called on his G8 partners to come together and match the United States’ commitment with an additional \$10 billion between them. Bush connected with these nations in creating the G8 Global Partnership Against Weapons of Mass Destruction, which would become a major outside source of funding for CTR. The original focus of the G8 Global Partnership was to be the improvement the security situation in Russia, and then afterward other host nations around the world that required assistance.¹¹⁰ Kenneth Luongo described the globalization of CTR, both in receivers and providers of assistance, as one of the last “great innovations” in the field of cooperative threat reduction.

Bureaucratic structures

At their first summit in Slovenia in 2001, Presidents George W. Bush and Putin made a significant alteration to the CTR-related bureaucracy: they officially eliminated the GCC. According to Matthew Rojansky, Presidents Bush and Putin regarded the GCC “as a relic of the unique circumstances of the previous decade.”¹¹¹ Despite the number of critical issues in U.S.-Russian relations on the agenda in Slovenia, including NATO expansion, ballistic missile defense, and the creation of a “sound investment climate to improve Russia's future economic prosperity,” Putin and Bush did not announce any official forum for these topics to be discussed.¹¹²

In his statement, Bush noted that he would send Secretary of Treasury Paul O’Neill, Secretary of Commerce Donald Evans, Secretary of State Colin Powell, and Secretary of Defense Donald Rumsfeld to Moscow in order to maintain dialogue, however this appeared to be done on an ad-hoc basis, with no appointed manager in charge of organizing these meetings, other than the presidents themselves.¹¹³ Unlike the GCC, which was co-chaired by non-presidential officials and placed in a formalized, regularly occurring setting, the ad-hoc Bush-Putin plan was vulnerable to changes in the personal priorities of two presidents. Without the official framework of the GCC, these cabinet level secretaries and ministers were not placed on timetables, were separated from their American and Russian colleagues with whom they should have been closely collaborating, and were held accountable only to Presidents Bush and Putin – two national leaders with an extraordinary amount of responsibilities and concerns competing for their attention. In due time, potential responses to the 9/11 attacks, preparations for war in Afghanistan, and oversight of massive domestic bureaucratic overhaul (such as the creation of the Department of Homeland Security (DHS) and reform of the intelligence community), dominated the presidential agenda. By the end of the year, it was clear that this ad-hoc formula was not conducive to a productive agenda in CTR.

After their next summit in 2002, however, Bush and Putin announced the re-institutionalization of the U.S.-Russian bilateral dialogue: the Consultative Group for Strategic Security. The group was to be chaired by the secretaries of State and Defense, along with their Russian counterparts. Although other officials were included in the group, it was primarily focused on defense issues and “expanding and regularizing contacts” between American and Russian intelligence agencies.¹¹⁴ While this group was constructive in sharing intelligence related to the invasion of Afghanistan, this group was not focused on CTR programs. Once again, other issues trumped cooperative threat reduction—although this was less of a factor in detracting from the constructive output of CTR projects, as the bureaucracies did not need as much top-down direction and encouragement as during President Clinton’s first term.

In the early years of the George W. Bush administration, the U.S.-Russian bilateral CTR relationship suffered from a lack of structure. After the dissolution of the GCC, no effective institution replaced it. CTR Programs continued operating under previously signed implementation agreements, but the lack of high-level institutional collaboration produced a lack of significant oversight and management. The lack of a bilateral interagency forum also detracted from DOD-CTR officials' ability to coordinate productively with the necessary Russian partners.

Since signing an agreement in the 1990's, DOD-CTR and the Russian Aviation and Space Agency (RASA) had been cooperating to design a rocket motor dismantlement facility. This facility would destroy the propulsion systems removed from ICBMs and other missiles slated for dismantlement. In January 2003, after DOD-CTR and RASA had worked for nearly a decade and spent about \$100 million, the project ceased and the program closed.¹¹⁵ The rocket motor destruction facility was originally to be located in the city of Perm according to the agreement. However, due to environmental concerns, local residents protested the facility's location. The proposed location moved to Votkinsk in February 1998.¹¹⁶ DOD-CTR and RASA continued with their design work through this time period. However, in January 2003, RASA notified DOD-CTR officials that the regional government in Votkinsk denied the land allocation permit.

Due to the absence of an institutional forum with other government agencies, RASA and DOD-CTR could not effectively coordinate with the necessary government officials. At a minimum, DOD-CTR and RASA should have been able to effectively communicate that logistical aspects of the project implementation were failing, in which case design work and other expenditures could be canceled. In addition, had there been higher level political officials in charge of the implementation of this agreement, such as the prime minister in the case of the GCC, then project implementation could be ensured through the proper government channels.

On November 21, 2005, as part of the administration's broad initiative on reform in the intelligence community, the Office of the National Director of Intelligence created the National Counterproliferation Center to manage, coordinate, and integrate the intelligence activities of several government entities with regards to WMD and related materials, technologies, and delivery systems: the CIA, Federal Bureau of Investigation, the National Geospatial Intelligence Agency, the National Reconnaissance Office, DOE, Defense Intelligence Agency, National Security Agency, DOS, Department of the Treasury, and DHS.¹¹⁷

This change, however, was unaccompanied by an analogous consolidation between the DOD, DOE, and DOS in their wide range of CTR activities. Although the intelligence regarding WMD was grouped together among agencies, there was no individual or managerial group to oversee and coordinate weapons dismantlement, transportation security, fissile materials storage, and expertise proliferation programs.

In 2005, the languishing CTR network—both within the U.S. and between the U.S. and Russia—would experience a welcome turnaround after Presidents Bush and Putin signed the Bratislava Nuclear Security Initiative (see “Bratislava Nuclear Security Initiative” section). However, despite the results achieved by the Bratislava Initiative, Presidents Bush and Putin's bureaucratic approach to CTR led to a decline in U.S.-Russian engagement and cooperative spirit. In a 2011 interview with Fareed Zakaria, Russian Minister of Foreign Affairs Sergei Lavrov stated, “President Bush had very good relations with President Putin and then with President Medvedev, but this chemistry did not translate into the lower levels of bureaucracy and we did have misunderstandings, in too many things.”¹¹⁸

September 11, 2001

The emotionally shaking events of September 11 represented the most consequential incidence of terrorism during the Bush-Putin period. It was not long after 9/11 that the connection was drawn between terrorism and WMD and brought to the forefront of CTR analysis.

While the prevention of nuclear terrorism was always recognized as a key benefit to CTR, other benefits, such as dismantlement of nuclear warheads and strategic delivery vehicles, the development of close working relationships between U.S. and Russian institutions, and increased transparency of the Russian nuclear weapons and energy complexes were also recognized as clear assets of CTR. However, in the wake of the terrorist attacks of September 11, 2001, the vast majority of CTR analysis shifted to counterterrorism benefits under the George W. Bush II administration. 9/11 served as a major focusing event; terrorism, particularly nuclear terrorism, was always seen as a serious threat, but the events of 9/11 galvanized the nation—President Bush, the U.S. government, and American academic analysis—into swiftly countering the potential threat of WMD terrorism.

The incidence of HEU and plutonium smuggling discovered during the Clinton administration confirmed the reality, not simply the potential threat, of a seriously ungarded nuclear complex. Cases in Munich and Prague had placed Russian weapons-grade fissile material outside the FSU and in major Western cities. In addition, Al Qaeda, a non-state terrorist group, had succeeded in staging a well-coordinated major attack against the United States from a safe haven deep inside Central Asia. After 9/11, the frightening realizations started to come into focus – and the corollary was apparent: how long would it take before these two realities crossed each others' paths? If a terrorist group such as Al Qaeda obtained sufficient fissile material, would it be capable of constructing an improvised nuclear device? Depending on the amount of fissile material at its disposal, a group could build their own IND based solely on publically available information.* By 2001, all the necessary ingredients of a nuclear terrorist attack had been demonstrated: the availability of Russian fissile materials; and the motive, planning, logistical capability, and global reach of a terrorist organization to attack the U.S. from a safe haven hidden halfway around the world.

As previously noted, constructing an IND is no longer a mystery of physics. By 2001, there was enough public information available to assert that IND construction was mainly an engineering challenge, not one of physical science. However, scientists trained in nuclear weapons design could ease the burdens and challenges of constructing an IND, if they were motivated to do so. With a weapon expert's help, device design improvements could decrease both the size of the IND and the amount of fissile material required to detonate it. Due to these factors, the Bush administration quickly changed its stance on CTR projects, especially those aimed at curbing the proliferation of weapons design expertise. In budget requests after 9/11, the Bush administration would not present such deep funding cuts as it had in FY2002.

The Bush administration's focus on countering the terrorist threat quickly developed into a massive effort on a global scale. This included combating terrorism both preemptively, by hunting down terrorists and disrupting their financial networks while they planned attacks, and preventively, by developing democratic institutions and inciting economic growth in failed states and bolstering security measures in the American homeland. Preventing WMD terrorism was

* The design for a so-called 'gun barrel' type weapon is much simpler than the 'implosion' type. Basic schematics for a gun barrel type weapon are available publically. Please see figure 3 for details.

certainly an important facet of the Bush team's counterterrorism strategy, but it was one facet of many that comprised an extensive and ambitious agenda. In President Bush's 2002 state of the union address, he labeled North Korea, Iran, and Iraq as an "Axis of Evil," a group of states that are both aspiring to acquire WMD and maintain close ties to terrorist groups. Bush declared that it was of particular importance to prevent these states from acquiring nuclear weapons and other WMD. As the counterterrorism agenda encapsulated the globe, the existing framework of CTR programs also expanded beyond the borders of the FSU.

NATO Expansion

The enlargement of NATO was a less serious threat to U.S.-Russian relations and CTR progress than it was during Clinton and Yeltsin's presidencies. After 1997 when the first new members were invited to join NATO, this became an accepted reality for U.S.-Russian relations going forward. NATO expansion continued during Bush's term, and Putin of course objected, but it did not do so dramatically in confrontational headline-grabbing public statements, as other officials had done during the Yeltsin years. In a press conference from Bush and Putin's first presidential summit in Slovenia in 2001, Putin commented briefly on NATO enlargement, in a disapproving yet not excessive manner.

"Our attitude toward NATO was not one toward an enemy organization; of course not... When a president of a great power [President George W. Bush] says that he wants to see Russia as a partner, and maybe even as an ally, this is worth so much to us. But if that's the case, then, look, we ask ourselves a question: Look, [NATO] is a military organization. Yes, it's military. They don't want us there [as a member nation] – [yes,] they don't want us there. It's moving towards our border. Yes, it's moving towards our border. Why?"¹¹⁹

The alliance expanded in 2004, extending membership to Slovenia, Slovakia, Bulgaria, Romania, and—most importantly for the Russians—Estonia, Latvia, and Lithuania. Despite NATO's move into the territory of the FSU, CTR projects continued their operations and remained relatively isolated from the overbearing East vs. West rhetoric. NATO enlargement's decreased influence on political matters—domestically in Russia and the U.S. and in U.S.-Russian relations—combined with a greater sense of urgency in counterterrorism cooperation guaranteed a smoother environment in which CTR could flourish largely without political risk.

The NATO enlargement issue flared up again late in the Bush administration with the prospect of providing membership action plans (MAPs) to Ukraine and Georgia. The Russian leadership did respond negatively to this possibility, but these nations were not granted MAPs and the issue did not penetrate the CTR relationship.

Personal relationships between U.S. and Russian counterparts

Unfortunately, the Bush-Putin years represented a step back in the development and maintenance of personal relationships between U.S. and Russian diplomats and scientists. Part of this effect was due to the dissolution of the GCC, especially for the technical workers and scientists who used to frequently meet to discuss cooperation between their countries. The bureaucratic power shift that occurred under Russian President Vladimir Putin also changed the tone of U.S.-Russian personal relationships in this area.

As Kenneth Luongo observed, the Russian security services (FSB) and Ministry of Foreign Affairs (MFA) gained more political clout under President Putin. These two groups traditionally had less control and significance on the working-level CTR contacts between Russians and Americans during the Clinton-Yeltsin years, due to the presence of the GCC and the opportunity for lower level technocrats unassociated with the MFA and FSB to work directly with one another without an intermediary. The removal of the GCC and the shift of power towards the FSB and MFA created a situation in which American negotiators lost their primary channel of contact and now had to create new relationships in order to match the new hierarchy of influence within Russia.¹²⁰ In essence, the strong personal connections built under the Clinton-Yeltsin years now represented sunk investments in some cases. The Russians with whom American negotiators worked well were no longer in the positions of influence.

In addition, the closure of the NCI in 2003 contributed to difficulties in meeting new contacts or maintaining regular contact with Russian scientists based in the nuclear cities. Under the IPP program, Russian and American lab scientists were paired together with a U.S. business partner in order to create a commercially viable project. The American scientist, under the program designated as the Principle Investigator (PI), was responsible for outreach to both the Russian and U.S. commercial participant. After the NCI implementing agreement expired in 2003, it was not renewed. This led to a push in PIs under the IPP program attempting to reach out to Russia's nuclear cities. These cities still retained special personnel access restrictions for foreigners, meaning that the PIs often had to resort to coordinating with their Russian partners from nearby open cities due to personnel access issues.¹²¹

Level of Trust between Corresponding U.S. and Russian Military/Bureaucratic Bodies

As has always been the case, any Russian nationals traveling to the U.S. must obtain a visa. Russian participants in a CTR and nonproliferation collaboration workshop noted that obtaining an American visa has historically been difficult in some instances; however, 9/11 and the subsequent passing of the USA PATRIOT Act have further complicated the visa application process for Russians traveling to the United States to work with their American counterparts on CTR initiatives.¹²²

Unlike the Russian system, in which American CTR personnel were accounted for on government lists and provided with specially expedited multiple-entry visas, Russian participants were now required to travel to the nearest American consulate for a mandatory in-person interview. The Russian CTR officials were irritated by the lack of balance and inequality of the visa regimes. Without this interview, Russian CTR professionals could not obtain new visas, despite the fact that they had already been on the record as working with the American government in the past.

To complicate matters further, these scientists' background in nuclear weapons design and employment in former WMD production complexes raised significant concerns with American consular officers. Due to regulations and, in some cases, suspicions, many Russian participants cited delaying complications (if not outright refusal) of visas as a significant hindrance to working with their American colleagues. Russian participants in the workshop were surprised that they were not included on 'white-lists' for visa applications, due to their cooperation with the American government on issues of national security. While most Russian participants understood the necessity for increased security around the issuance of visas in

response to the 9/11 attacks, they noted this lack of a 'white list' as a signal of bureaucratic miscommunication. After visa expediting processes were both removed and not reinstated after the problem was raised, Russian workshop participants felt neglected and irritated. Both Russian and American workshop participants noted that Russian visa regimes were becoming stricter to address the imbalance.¹²³

Domestic Political Concerns

After 9/11, nuclear terrorism became a serious concern of the Bush administration. The domestic political discussion was also highly focused around terrorism and how best to prevent another attack against the United States. However, in 2002, President George W. Bush placed the entire CTR program agenda in Russia at risk: President Bush deliberately abstained from certifying Russia as a state "committed to its arms control obligations" under the Chemical and Biological Weapons Conventions. President Bush claimed that Russia was not sharing enough information regarding these two programs and due to its lack of cooperation it would not receive this certification. Due to legislation that Congress had previously passed, assistance to Russia was conditional upon several factors, including this presidential certification. Russia's lack of certification would prohibit it from receiving any security assistance funding, including all funds under the CTR programs.¹²⁴ Despite the lack of a connection between the chemical and biological impasses to the ongoing nuclear programs, all nuclear CTR projects would be prohibited from spending money toward securing the Russian Federation.

Once again, the Congress counteracted Bush's provocative measures against CTR and passed legislation that waived the certification requirement for FY2002 in the emergency supplement bill. According to this legislation, Russia was still eligible to receive CTR funds until the close of the fiscal year 2005. Although Bush initially brought the issue to the Congress, the President signed the bill into law. George W. Bush was highly criticized for putting the entire CTR regime in danger and suspending necessary nonproliferation programs that are in both the United States' and Russia's interest. Especially after 9/11 and the administration's stated focus of preventing WMD terrorism, this seemed to be an excessive political move in order to encourage Russia to increase its transparency in chemical and biological CTR.

In Russia, the domestic political climate changed drastically under President Putin. Whereas Yeltsin's time in the presidency was characterized by a defiant Duma looking to undercut his reform policies, Putin enjoyed an incredibly wide base of support. Putin's party, United Russia (UR), became staggeringly strong since the December 2003 parliamentary elections. UR received 223 of the 450 seats, amounting to 49.5%. After a sizeable group of independents joined the party, UR gained a two-thirds majority in the Duma.¹²⁵ UR's two-thirds dominance would remain in effect until the December 2011 elections, well after Putin's second presidential term ended. This unquestionable support of the presidency from the legislature was instrumental in facilitating the quick adoption of new legislation and supporting the President's CTR agenda. In contrast to Yeltsin, who issued over 1,500 presidential decrees (thus circumventing the legislature), Putin could easily rely upon the legislature to pass laws according to his agenda.¹²⁶

The Bratislava Nuclear Security Initiative

In February 2005, Presidents George W. Bush and Vladimir Putin met in Bratislava to discuss nuclear security. Several of the aforementioned factors during the George W. Bush administration running up to 2005 were significant impediments to and detractors from CTR progress and collaboration. After speculation as to President Bush's response to these lapses in bilateral cooperation, the Presidents announced their summit in Bratislava.

After successful discussions and a productive meeting, Bush and Putin emerged with a signed agreement detailing several welcome milestones in U.S.-Russian CTR collaboration. First, the Bratislava statement introduced new initiatives in which Russia and the United States would lead a coordinated global effort to stem the proliferation of WMD. Also, the Presidents signed an action plan detailing the next steps between the U.S. and Russia for CTR collaboration.

The action plan would be overseen and implemented by the U.S. secretary of energy and the Russian Director of the Federal Atomic Energy Agency (Rosatom).^{*} These two individuals would provide their respective presidents with a progress report every 6 months detailing their achievements. The action plan focused on 5 critical areas: (1) Emergency response coordination, (2) the sharing of best practices, (3) the enhancement of a "nuclear security culture," (4) research reactor conversion, and (5) accelerated MPC&A upgrades for a list of designated facilities. The comprehensive action plan, with a list of deliverables, was to be completed by 2008.¹²⁷

Several new international and U.S.-Russian bilateral groups were founded at the signing of the 2005 Bratislava initiative. The two most important of these were the Global Initiative to Combat Nuclear Terrorism (GICNT) and the Proliferation Security Initiative (PSI). The GICNT is a wide multilateral forum, co-chaired by the United States and Russian Federation, which is focused on implementing common nuclear security principles. All participating nations sign the Statement of Principles, a list of commitments related to improving nuclear security in the signatory nation and providing assistance to other signatories. The Statement of Principles is a commitment of intent, rather than a binding document requiring specific measures to be introduced.¹²⁸ Despite its lack of an enforcing mechanism, this has served as an important forum through which Russia and the U.S. can show their leadership and provide assistance to signatory nations. The Statement of Principles as intent rather than verifiable implementations is also intentional: the GICNT is meant to address and include as many countries as possible, to engage them in bringing about these security measures through requesting assistance in a multilateral forum. There are 85 member nations, plus the IAEA, European Union, INTERPOL, and the United Nations Office on Drugs and Crime serving as observer entities.

Next is the Security Proliferation Initiative, which is also designed around maximum inclusion and a lack of firm regulatory frameworks. The PSI is also based on a signature of principles, related to a commitment to interdicting transfers of illicit WMD materials, developing the legal and law enforcement capability to address such trafficking, and developing procedures of informational exchange regarding WMD-trafficking intelligence.¹²⁹

Finally, the bilateral commitments between the U.S. and Russia proved to be successful; the 2008 deadline served as a driver for results, just as the 6 month timetable for the GCC. One of the main highlights for the successful close of the Bratislava Initiative in 2008 was an announcement of the MPC&A program. The Mayak storage facility, one of Russia's largest (and previously visited by Frank von Hippel in 1994), had been fully equipped with the appropriate security upgrades.¹³⁰

^{*} Minatom was restructured and renamed 'Rosatom' under Putin's presidency.

In a welcome break from the early years of the Bush-Putin period, the Bratislava Initiative has provided immeasurable security benefits both bilaterally and multilaterally. In addition to the 10+10 Over 10 plan and the G8 Global Partnership, the Bush and Putin administrations demonstrated their commitment and ability to lead the international community in assisting to mutually enhance international security from nuclear threats.

The Obama-Medvedev Years (2008-2012)

As a senator, Barack Obama traveled with Senator Richard Lugar to Russia on a visit to one of the Defense Threat Reduction Agency's (DTRA)* weapons dismantlement procedures. His awareness and appreciation for nuclear security matters were made apparent shortly after his inauguration, when he delivered a speech in Prague outlining an ambitious plan to secure the world's nuclear materials and eventually disarm all nuclear arsenals. His speech called for the elimination of all loose fissile materials within 4 years. While the achievement of this goal seemed highly improbable, the Obama administration has shown several successful steps in securing direct-use material. In addition, through the "reset" policy, the Obama administration has shown a greater awareness and proactive sensitivity for U.S.-Russian bilateral relations. These two policy priorities set a solid foundation for a productive CTR relationship. The Obama-Medvedev period has been characterized by some critical CTR achievements; however, several factors indicate that the U.S.-Russian CTR relationship has also suffered from 2009-2012.

Incidence of terrorist attacks

While there were no terrorist attacks linked to fissile materials or nuclear terrorism, President Obama's policies are nonetheless driven by a commitment to preventing nuclear terrorism. In his Prague speech, on April 5, 2009, Obama said, "Today, the Cold War has disappeared but thousands of those weapons have not. In a strange turn of history, the threat of global nuclear war has gone down, but the risk of a nuclear attack has gone up."¹³¹ Obama spoke on the threat of nuclear terrorism in his Prague speech, and asserted that the only method of ensuring that the world is safer from it is to reduce access to fissile material, intact weapons, or markets through which to acquire these items.

The first step in Obama's comprehensive plan to reduce the risk of nuclear terrorism is proposing a verifiable fissile material cutoff treaty, in which signatories pledge to stop the production of HEU and plutonium for nuclear weapons. Obama stated that stopping the further increase of direct-use material in the world would be the first step to limiting the supply of material potentially susceptible to theft.¹³²

Obama continued, "We must ensure that terrorists never acquire a nuclear weapon...and we know that there is unsecured nuclear material across the globe... So today I am announcing a new international effort to secure all vulnerable nuclear material around the world within four years. We will set new standards, expand our cooperation with Russia, [and] pursue new partnerships to lock down these sensitive materials."

Next, Obama spoke on the importance of the GICNT and PSI, suggesting that the wide international cooperation achieved with these efforts should be extended to a Nuclear Security

* DTRA is a recent reorganization of several offices and functions within the Department of Defense. DTRA is responsible for all DOD-CTR implementation.

Summit (NSS). Although Obama originally intended this summit to be hosted by the United Nations (as he said in his speech), the NSS was eventually hosted in Washington, DC in 2010. A second round of the NSS was held in Seoul, South Korea in March 2012. While these Nuclear Security Summit meetings have been helpful in convening many heads of state from around the world and obtaining new commitments to action, most U.S.-Russian cooperation is still performed on a bilateral basis.

Program funding

Thus far the Obama administration's CTR budget requests have not matched expectations following the high aspirations expressed in the 2009 Prague speech and engagement with Russia. The early CTR budget decline of FY2010 casts further doubt on the feasibility of Obama's 4-year goal, but this was somewhat offset by a surge in funding for FY2011. Following a heated government debt debate in 2011, subsequent budgets have once again begun to decline.

The Obama administration's FY2010 budget request of \$2.7 billion (a combination of relevant WMD international security programs from the Departments of State, Defense, Energy, and Homeland Security) represented a 7% decrease from the corresponding appropriations of FY2009.¹³³ For FY2011, on the other hand, the administration increased its budget requests in response to the 4-year effort outlined in the Prague speech. The administration request included a 23% increase in DOD-CTR funding, including \$74 million to address the 4-year effort (including \$44 million specifically for projects based in Russia). NNSA's budget request also increased by a substantial \$240 million margin.

Unfortunately, in FY2012, the Obama administration's NNSA request decreased \$165.5 million from FY2011, \$68.7 million of which are for programs that saw the 4-year plan-related increase in FY2011.¹³⁴ The DOD-CTR program's FY2012 request has also seen a decrease in \$14.3 million from the previous year down to a total of \$508.2 million.

The Obama Administration's FY2013 budget request is not yet clear; specifics regarding individual program requests within DOD and DOS have not been disclosed. For NNSA, the report discloses a \$163 million (7%) increase above the enacted 2012 budget, "which reflects completion of accelerated efforts to secure vulnerable nuclear materials within four years, the President's stated timeframe."¹³⁵ Congress' willingness to appropriate this increased figure remains to be seen, however.

Funding under the Obama administration has been constrained primarily for two reasons: the changing economic position of the United States, and the completion of some CTR project portfolios. First, in some cases, such as the MPC&A's Strategic Rocket Forces project, funding decreased drastically between the Bush and Obama administrations (see figure 5). Between FY2006-2008, the Bush administration contributed at least \$120 million to this project. In FY2009-2010, this budget decreased to levels consistently less than \$50 million. This significant change does not represent a lack of commitment for the project, but rather a significant milestone. This project completed security upgrades at 9 sites belonging to the 12th Main Directorate, the entity within the Russian MOD responsible for nuclear warhead security. Second, 2009-2012 has been characterized by increased public pressure to decrease funding after an economic crisis and doubts about the U.S. government's financial position.

Domestic political pressures

President Obama faces a much different domestic political situation than his predecessor: whereas George W. Bush's CTR policy was defined by a dominating focus on counterterrorism and program expansion beyond the FSU, Obama's ambitious CTR policy has been stifled by the significantly worsened financial position of the U.S. government. This can be ascribed to a number of factors, including the 2008 economic crisis and the 2011 debt ceiling debate. The economy has become the single most important and regularly discussed political issue from 2009-2012. Because of the United States' high unemployment rate, slow economic growth after the 2008 crisis, and high government debt, the Obama administration has been under extreme pressure to cut funding across the entire government.

The so-called "supercommittee," a body in Congress created by the Budget Control Act of 2011, was charged with negotiating over a trillion dollars in deficit reductions over the next decade. Many of these cuts have been focused on the DOD and national security spending. In order to provide suggestions for DOD and national security budget cuts, the Obama administration released a Defense Strategic Guidance report, which focuses on decreasing defense commitments in force structure rather than CTR-related and WMD counterterrorism.¹³⁶ Although the administration appears to place a premium on shielding CTR from the massive proposed budget cuts, CTR has historically suffered budget cuts in Congress disproportionate to those of other DOD programs, such as under the Clinton administration.

Level of trust between Corresponding U.S. and Russian military/bureaucratic bodies

The GAO reported in December 2010 that NNSA's future of cooperative nuclear nonproliferation programs in Russia was uncertain. The report ascribed this to "questionable high-level Russian political commitment" to continue working with the United States on its CTR projects.¹³⁷ Rosatom and MFA officials stated to the NNSA that Russian nuclear materials are "fully secure," and therefore saw "little value in continuing to work with the United States" in the sphere of CTR. Russia reiterated its claim that all nuclear materials were secure in its official statement at the April 2010 NSS:

"Russia maintains its nuclear security at an appropriate level. The Russian Federation confirms that all nuclear materials in its territory and respective facilities are safely protected, so there are no vulnerable nuclear materials or facilities in its territory, which would raise concerns due to their security level."

According to its own performance measures, NNSA has not completed work in Russia and disagrees with these statements. In addition to continuing upgrades at facilities to which U.S. officials currently have access, there are some facilities that NNSA expressed interest in upgrading but has yet to receive access authorization.

A Russian official from the MFA informed the GAO of the MFA's position that the CTR umbrella agreement should not be renewed for a third time after current extension protocol expires in 2013. NNSA has confirmed that without an extension to the umbrella agreement, it would be "impossible" to continue the MPC&A program in Russia, with the exception of projects coordinated with Rostekhnadzor (Russia's supervisory body on ecological, technological, and nuclear issues).¹³⁸ Russian officials substantiated this position by stating the importance of being considered an "equal partner" rather than a recipient of U.S. nuclear security

assistance. They continued to say that the focus of nuclear nonproliferation risks should be in other countries.

It appears that this unprecedented position by the MFA will not completely discontinue CTR work in Russia. The GAO report affirms that it is likely that CTR sustainability cooperation between the U.S. and Russia will continue until 2018 under separate agreements. These comprise of measures to increase Russia's ability to provide nuclear security entirely on its own. The GAO reported that the design and implementation of these sustainability programs has been difficult and will continue to be so due to the Russian position that its nuclear security budgets are secret. Russian officials have refused to provide Americans with this budgetary information.¹³⁹

In addition, NNSA and the MOD have begun negotiating agreements for upgrades at warhead storage facilities past 2012. This can be an indicator either that Russia wants to move toward a different legal framework concerning CTR—more closely based on individual implementing agreements—or that the MFA in particular, in contrast to other ministries, does not wish to continue CTR work with American officials.

Bureaucratic structures

Although it was disbanded by Presidents George W. Bush and Putin in 2001, the Gore-Chernomyrdin Commission remained an influential element of U.S.-Russian relations, serving as the template for the Bilateral Presidential Commission (BPC), which was agreed upon between Presidents Obama and Medvedev in June 2009. The BPC contained many similar aspects of the former GCC, however its 2009 revitalization saw many more committees and working groups spanning a wider range of issues, both in breadth and in depth. The primary reason for the differences between the BPC and GCC lie in the drastic domestic differences in Russia and the American strategic outlook regarding policy toward Russia between the 1990s and 2009.

First, and most important, is Russia's change between the 1990s and 2009. Russia's economy has stabilized and grown substantially since the days of extreme inflation and the struggles of privatization. During meetings of the GCC, in the context of the 1990's, Americans brought Russians to the negotiation tables in an attempt to buttress their economy and assist the transition from communism to democracy. The majority of resources were provided by the United States, for Russia's benefit. By 2009, Russia has become a much more stable country with both economic and political certainty. There is much less of a need for immediate American assistance across the areas of engagement addressed by the BPC; however, according to the December 2010 GAO report, there is little evidence that Russia has developed its own capacity to fully carry out CTR work on its own. In addition to Russia's decreased necessity to seriously engage the United States in the BPC, the United States still has a high level of strategic interest in cooperating with Russia. Through the BPC, the U.S. has discussed issues of paramount importance to its global strategic outlook, including the issue of continued uranium enrichment in the Iranian nuclear program and Russian assistance to the NATO operation in Afghanistan.

In addition to the creation of the BPC, the Obama administration ushered in a few other changes in bureaucratic structure. Unlike previous administrations, Obama's team instituted two key positions at the National Security Council (NSC): Gary Samore now serves as Special Assistant to the President and White House Coordinator for Arms Control and Weapons of Mass Destruction, Proliferation, and Terrorism; and Laura Holgate serves as Senior Director for WMD Terrorism and Threat Reduction.¹⁴⁰ Never before was there one individual in charge of orchestrating the U.S. government's collective CTR efforts across DOD, DOE, and DOS. These

two individuals of the National Security Council have the specific responsibility of coordinating the interagency CTR strategy and implementation of the United States. In past administrations, other officials have provided input and support for CTR strategy (such as Les Aspin and William Perry, two individuals who were involved in the creation of the Nunn-Lugar legislation and served as secretary of defense under President Clinton) but these were informal and temporary commitments and not full-time designations. Former secretaries of defense, for example, have a much wider range of responsibilities that often involve active engagements demanding immediate attention over preventive CTR measures.

During the George H. W. Bush administration, the Freedom Support Act created the coordinator for assistance to the former Soviet states; however, this individual had no authority over CTR. President Clinton signed a national security directive according to which the NSC was responsible for oversight and coordination for all CTR programs, but issues with coordination still endured, as 'denuclearization' and MPC&A were formally categorized under separate directives.¹⁴¹

The appointment of a threat reduction coordinator in the NSC should abate several issues experienced over the last 20 years. First, CTR programs are administered over a range of agencies and federal departments, most notably DOD, DOE, and DOS. In several cases, programs administered by different agencies were performing the same mission, such as the Defense Conversion program in DOD and the Industrial Partnering Program* in DOE. These programs, apart from their redundancy, were not well coordinated. Best practices and lessons learned were shared rarely, if at all. Program coordination issues were especially pronounced in the knowledge proliferation programs, as there was no mechanism to ensure that two different programs were funding the same team of former Soviet scientists for a single project proposal.¹⁴² Maximized CTR program coordination and efficiency on the American side would result in a much more improved environment for U.S.-Russian cooperation. Clarity and a lack of redundancy will assist Russian officials (or scientists applying for research grants) in understanding the American CTR framework. Also, a more efficient and productive CTR structure will result in more storage sites secured, more scientists reemployed, and more warheads deactivated using fewer taxpayer dollars.

According to a December 2011 GAO report, the absence of substantive improvements in coordination for anti-smuggling initiatives is indicative of wider problems across the U.S. government's CTR efforts. Among other issues, there are three different published strategic plans for this field. Each one has its own drawbacks, and they are not all consistent. In addition, GAO identified 6 programs that provide training to foreign border security and customs officials to prevent nuclear smuggling. The executive branch agencies responded to GAO stating that these programs are in fact different, with slightly distinct program missions, areas of geographical operation, and involvement with foreign funding.¹⁴³ Although evidence of significant improvements in these problems has yet to be observed, a unified coordination office in the NSC provides greater opportunity to improve on these issues, as opposed to ad-hoc interagency meetings.

* IPP later changed its name and underwent a bureaucratic merger. While the Defense Conversion program was still in operation, it was known as the Industrial Partnering Program.

NATO expansion

NATO continued with its expansion in 2009 with the inclusion of Albania and Croatia. These were not particularly contentious additions from a perspective of U.S.-Russian relations, and there is no evidence to suggest that 2009 enlargement round had any effect on U.S.-Russian collaboration with regards to CTR.

Personal Relationships Between U.S. and Russian Counterparts

With the creation of the BPC, a venue through which Russian and American officials can work together on a regular basis has reemerged. Although the BPC has only recently been formed, the several working groups related to CTR, including the nuclear energy and nuclear security working group, have already met frequently and produced significant results.

Between 2009 and 2012, officials from the nuclear energy and nuclear security working group have met over 16 times. The working group has convened several symposia and events that are centered on people-to-people contacts and exchanges of best practices and research ideas. For example, in February 2012, the American working group officials invited a delegation of Russian scientists to visit the Consortium for Advanced Simulation of Light-water-reactors at the Oak Ridge National Laboratory.¹⁴⁴ At this event, fellow scientists discussed nuclear energy modeling and simulation, the integration of supercomputing technologies into their field, and the development of a nuclear safety code. Meetings that involve constructive people-to-people dialogue are essential to forming and maintaining personal bonds between the Russian and American nuclear sectors. These events are not just focused on solving existing issues, but also include research and discussions on future capabilities and nuclear safeguard development. After the bureaucratic disconnect during the Bush-Putin years, the co-sponsored events of the BPC represent a renewed effort to connect Russian and American colleagues.

Plutonium Disposition and the 123 Agreement

Under Obama and Medvedev, the U.S. and Russia signed two milestone agreements: the Plutonium Disposition Agreement and the so-called 123 Agreement. The Plutonium Disposition Agreement, which calls for the elimination of excess weapons-grade plutonium, had been agreed to in principle and signed under the Clinton administration, but the implementing legislation guaranteeing verification had not been signed. The 123 Agreement calls for various forms of civilian nuclear cooperation and establishes several initiatives for strengthening nonproliferation cooperation between the U.S. and Russia. The legal frameworks required to develop joint safeguards technology, nuclear forensic analysis, and research reactor conversion from HEU to LEU technology are all provided by this agreement.¹⁴⁵

Conclusions and Policy Recommendations:

The first conclusion which must be drawn is that providing a single metric to measure the level of cooperation among the United States and Russia in its threat reduction programs can be misleading. Each contributing factor identified in this research has differing effects, and many of them have considerable interaction, which affects the overall outcome on productive U.S.-Russian CTR collaboration. In addition, these influences' interaction differs between presidential

administrations. Between 1992 and 2012, the DOD-CTR program deactivated 7,610 nuclear warheads and dismantled 2,537 strategic delivery vehicles (see figure 7); this cannot be considered the only metric of success, however.¹⁴⁶ For example, the leadership for which Russia and the United States take responsibility in the international community regarding CTR objectives is also strong evidence of the mutual interests and strong partnership between the two countries.

Keeping in mind the conclusions of this research, the incoming presidential administration, whether headed by Barack Obama or not, should implement several changes in the framework of CTR programs. In addition to correcting and removing barriers to success, it is important to take note of which policies have been positive contributions. Continuation of good practices is a crucial step in moving forward toward the most efficient and collaborative CTR relationship between the United States and Russia.

Bureaucratic structures

The effect of bureaucratic structures on U.S.-Russian CTR cooperation has generally remained strong: much of the Clinton and Obama administrations' success is owed to the GCC and BPC, and the George H. W. Bush administration's ability to cooperate with Russian officials was severely compromised due to ineffective bureaucratic structure. However, George W. Bush and Putin's aversion toward structured bilateral bureaucracy and subsequent progress in CTR showed that this is not always a prerequisite for effective CTR collaboration.

Under the George H. W. Bush administration, for example, CTR programs were housed within the DOD due to the Nunn-Lugar legislation's funding authorizations. The DOD standardized contactor selection process and the subsequent failure of the Defense Conversion program illustrated DOD's inability to effectively administer CTR knowledge proliferation programs. Unqualified contractors were selected to design commercialized projects with Russian scientists, and the DC program subsequently was cut from the CTR budget altogether by 1995. The institutional characteristics of the DOD—which were poorly suited for knowledge proliferation CTR programs—prevented any significant and sustained U.S.-Russian cooperation in the DC program.

Policy Recommendation 1:

Institutional support mechanisms for CTR programs, such as contractor selection processes, must be designed to address the end-goals of the program. The Defense Department's utilization of its standard bidding process on the Defense Conversion program resulted in program failure due to overreliance on cost in contractor selection criteria. Instead of adopting standard department-wide processes, DOD should have created a unique set of selection criteria based on the end-goals of the DC program. Examples of goal-centric criteria are provided below:

- experience working in high-risk commercial environments
- experience working in Russia and the FSU
- commercial projects involving levels of scientific expertise comparable to those of target former Soviet scientists

The GCC and BPC are two examples of how well-structured institutional bilateral forums have contributed to successful U.S.-Russian CTR cooperation. Through the combination of working-level technical cooperation and significant political authority behind one single institution, these institutions ensured the regular dialogue between American and Russian CTR officials that contributed to the many agreements signed under both the GCC and BPC. The combination of technocrat-technocrat dialogue, ministerial-level dialogue, and top-down pressure from high level political figures—a strategy Kenneth Luongo called the “triangulated approach”—is highly effective in achieving concrete results for CTR purposes.

On the other hand, the lack of a constructive bilateral institution comparable to the GCC or BPC under Presidents Bush and Putin did not prevent the successful outcomes of the Bratislava Initiative. Many great advancements, such as the globalization of CTR and extensive security upgrades in Russia, were the result of the Bratislava Initiative and not of structured, high-level political meetings that occurred on a regular basis. This evidence suggests that the presence of a bilateral commission such as the GCC or BPC is not a prerequisite of the achievement of concrete results such as direct-use material storage facility upgrades and the creation to new multilateral forums for CTR cooperation.

While the Bratislava Nuclear Security Initiative under Presidents Bush and Putin produced impressive outcomes, the lack of a high-level regularly meeting body contributes to a decline in bureaucratic relations between Russian ministries and American departments. In addition, as time progresses and program objectives are met, a high level bilateral commission will be necessary to maintain this bureaucratic dialogue. The MFA’s position that the CTR umbrella agreement should not be renewed in 2013 is evidence for an increasing Russian opinion that CTR programs should be temporary. The ministerial and cabinet level officials of the BPC should focus on sustaining CTR programs; mutual transparency is another critical benefit of CTR programs (in addition to a decreased proliferation threat) that will be lost, potentially irreversibly, if CTR programs are officially closed.

Policy Recommendation 2:

The incoming Russian and American presidential administrations should not disband the BPC. The senior director for WMD terrorism and threat reduction should design a long-term strategic plan on how to create a sustainable U.S.-Russian CTR framework beyond the completion of weapons dismantlement and security upgrades. This official should work closely with BPC working group co-chairs in order to create a transparency-based CTR that serves both Russian and American interests once technical and financial assistance programs draw to a close.

While the GCC and BPC have proven themselves as effective institutions, the GCC had one weakness: its reliance on the personal connections of the individuals involved left a void when those individuals were no longer in positions of power. In order for a bilateral institution similar to the GCC or BPC to maintain its effectiveness over the long term, the effects of personnel turnover must be reduced. For example, Vladimir Putin is slated to return to the Presidency in May 2012. If Barack Obama is not reelected president in 2012, this will result in a completely changed composition and leadership of the BPC.

Policy Recommendation 3:

Barack Obama, Dmitry Medvedev, and Vladimir Putin should work to reform the BPC in order to develop characteristics of longevity. This should include the

appointment of long-term individuals to serve as co-coordinators in addition to the secretary of state and minister of foreign affairs.

President Obama's appointment of a senior director for WMD terrorism and threat reduction at the NSC is a positive development in the management and coordination of American CTR efforts. This position has not existed in any previous administration. Although some coordination issues remain unresolved, such as the overlap and redundancy of anti-smuggling initiatives, the appointment of a coordinating official within the NSC will have greater opportunity to effectively organize the government-wide CTR framework than ad-hoc interagency communication and meetings.

Policy Recommendation 4:

The incoming president should retain the post of senior director for WMD terrorism and threat reduction inside the NSC. The president and national security advisor should encourage this individual to take significant charge over the interagency CTR process in terms of coordinating program activities, budgets, interagency communication, and best practices. This NSC coordinator will ensure that U.S. government CTR efforts are well-integrated and guided by an overarching strategy. This individual will also assist in providing Congress with a more comprehensive and easily digested testimony on CTR oversight inquiries.

Incidence of terrorist attacks:

Terrorist attacks and other illicit activities, principally fissile material smuggling, served as important factors that motivated American administrations to encourage closer CTR collaboration among American and Russian officials. The fissile material smuggling incidents of 1994 galvanized the White House Office of Science and Technology Policy to conduct investigations through which to determine high risk facilities that desperately required upgrades. The terrorist attacks of September 11, 2001, encouraged George W. Bush to reverse his policy of contracted funding for CTR programs. The terrorist attacks also motivated the globalization of CTR programs (with the cooperation of the Russians) through the Proliferation Security Initiative, the G8 Global Partnership, and the GICNT. These new developments in the field of CTR highlighted Russian and American commitment to CTR through their co-chairmanship of the GICNT. Finally, the Obama administration showed a continued commitment to CTR and nuclear counterterrorism with Obama's Prague speech, in which the President outlined his 4-year effort to secure all fissile materials around the globe.

The one exception to the significance of terrorist attacks and their influence on CTR collaboration was during the George H. W. Bush administration, under which mutual lack of trust still significantly inhibited progress toward finalizing CTR negotiations despite the theft of HEU at the Luch facility.

Personal Relationships Between U.S. and Russian Counterparts:

Personal relationships proved to be quite valuable during the George H. W. Bush and Clinton administrations, but much less significant indicators of U.S.-Russian effective collaboration under George W. Bush and Barack Obama. In the early 1990's, when CTR programs were first established, collaboration between the United States and Russia was

hindered by many factors, including trust between bureaucratic and military bodies. Close personal relationships, such as those between Strobe Talbott and Georgi Mamedov or between the Russian and American scientists during the Bush and Clinton administrations, allowed individuals who had built trust amongst one another to facilitate the necessary processes to engage the U.S. and Russian bureaucracies together in meaningful work. During the George H. W. Bush administrations and the Clinton administration, U.S.-Russian CTR cooperation was highly dependent on personal relationships. The achievements of CTR cooperation during these years would be highly unlikely without these connections.

In contrast, during the George W. Bush and Obama administrations, personal relationships between U.S. and Russian diplomats or scientists played less of an important role in determining the quality of U.S.-Russian cooperation. Due to the MFA and FSB's increased role in acting as middlemen between American and Russian CTR officials, personal relationships were weakest under Bush and Putin out of all the 4 post-Cold War presidents' administrations. Yet, despite this disadvantage, the Bratislava Initiative created an incredible amount of results over the 3 year period it was administered, including the globalization of CTR forums and significant security upgrades in Russia, such as the one at the Mayak facility. Under Obama and Medvedev, the BPC began to foster personal relationships once more, although the achievements of signing the 123 agreement and the Plutonium Disposition Agreement seem to overshadow the BPC's newly budding personal connections.

Policy Recommendation 5:

Funding for U.S.-Russian university level exchanges, scholarships, and study abroad opportunities should be considered high priority. The future challenges of CTR, including retaining its relevance as a transparency mechanism, will be more easily addressed by individuals who share personal connections, a past history, and a shared sense of purpose.

Level of Trust Between U.S. and Russian Military/Bureaucratic Bodies

Trust between U.S. and Russian institutions has proven to be a significant factor for CTR operations across all four post-Cold War presidential administrations. Lack of trust between institutions invariably detracts from the implementation of CTR projects and the negotiation of new agreements; however, the degree to which low levels of trust diminishes CTR collaboration differs between administrations. In general, as time goes on, the level of trust between American and Russian institutions becomes a less significant indicator of U.S.-Russian CTR cooperation.

During the George H. W. Bush and Clinton administrations, the levels of trust between corresponding institutions working on CTR affairs were highly significant. The dispute over the fissile material production facility in 1991-1992 completely prevented any related project implementation. In addition, during the Clinton administration, Minatom's decision to prevent DOE from accessing any direct-use material and the Kurchatov Institute's subsequent decision to permit access exemplify how CTR progress is directly dependent on trust.

During the George W. Bush administration, levels of trust were less significant. Issues such as the visa regime complications show how low trust levels hindered progress; however, these operations only caused delays – they did not completely cease operation. From 2009-2012 under Obama and Medvedev, trust issues such as the provision of secrecy around Russian budgets for nuclear security programs threatens the ability for American officials to assist in designing programs that increase the Russians' independent capability of securing their own

nuclear complex. This is a more significant indicator from 2009-2012 than from 2001-2008 due to the MFA's lack of interest in renewing the U.S.-Russian CTR umbrella agreement.

Policy Recommendation 6:

The visa regime between the United States and Russia must be reformed. Officials working on national security matters such as CTR should be kept on file on a 'white list' in order to ensure that CTR operations are not delayed by excessive visa screening for national security officials. Such officials should go through the visa application process once, upon their appointment to the position that they serve on behalf of their government. 'White listing' should serve as an expedited process for CTR officials to obtain visas to travel to their partner countries. Alternatively, long-term multiple entry visas may be granted to CTR officials for the duration of service in their respective positions. These recommendations are aimed at reducing time delays in the visa process and preventing visa policy retaliations between Russian and American bureaucracies.

"Follow the Funding?"

As a general rule across all administrations, the level of congressional funding for any one program within the CTR mission is not a direct indicator of its success or failure. During the George H.W. Bush administration and into the first 2 years of the Clinton administration (through FY1995), CTR funding remained constant at \$400 million. CTR did not suffer from a shortage of funds, but a lack of specific projects to which funds could be assigned. Many disputes—over the safest methods by which to dismantle and store warheads and weapons-grade material, for example—prevented the allocation of funds into specific projects. Without specific projects identified or access to sites granted, these funds simply could not be applied. The application of funds was the issue, not the supply of these funds.

In addition, the drop in funding for the Strategic Rocket Forces MPC&A project in FY2009 did not indicate a decrease in cooperation levels. This decrease in funding was due to the fact that all scheduled security upgrades were completed, and the remaining funds were to be used for sustainability purposes.

In instances where funding directly compromises the scope of a CTR program, such funding decreases truly represent a decrease in the opportunities for U.S.-Russian cooperation. For example, President George W. Bush's proposed funding cut for the NCI program in FY2002 would have necessitated the withdrawal from 2 of the 3 nuclear cities involved in the program. The scientists and residents of these two nuclear cities would be excluded from these programs had Congress not partially reversed the funding cuts. Funding becomes a hindrance when funding levels drop below the minimum that is required to perform the duties that American and Russian officials have agreed to perform. Levels of funding are subject to interaction with different factors to varying degrees. Domestic political pressures and the incidence of terrorist attacks in particular have influenced the effect of program funding on U.S.-Russian CTR cooperation.

NATO expansion:

NATO expansion was not a significant factor affecting the level of collaboration on CTR projects between American and Russian officials. Between 1991 and 1992, NATO expansion was not a contentious issue, thus it did not hinder U.S.-Russian CTR collaboration. Despite the powerful political rhetoric displayed by Russian politicians during the Clinton-Yeltsin era, CTR issues remained isolated from NATO enlargement concerns. Finally, the Russian reaction to the accession of Estonia, Latvia, and Lithuania under Putin was much less confrontational than Yeltsin's objections during his presidency. Obama and Medvedev oversaw the accession of Croatia and Albania, and this event sparked little controversy between the administrations. CTR programs still continued their operation during the ongoing NATO enlargement discussion between Russia and the United States. There is little evidence to suggest that hindrances to CTR from NATO expansion represented anything more than political positions and rhetoric.

(See Policy Recommendation 8, below)

Domestic political pressures

Domestic political conditions were significant influences on CTR cooperation across all administrations. On the American side, this is mostly manifested in the domestic political climate and the US Congress. Congress' decisions regarding funding or cancellation of CTR programs altogether influenced American CTR officials' ability to work with their Russian counterparts. For example, the decision to cut the DOD Defense Conversion program from CTR funding in 1995 entirely eliminated an avenue through which American officials were attempting to provide assistance to former weapons experts through employment and help in transitioning to commercialized civilian projects. On the other hand, Congress has also acted to preserve CTR programs by appropriating funds in addition to the administration's budget request, such as the FY2002 NCI appropriation. Reemployment and outreach to scientists were allowed to continue in more nuclear cities due to Congress' action.

Policy Recommendation 7:

The senior director for WMD terrorism and threat reduction should assemble a team of CTR professionals, nuclear scientists, and policy advocates from nongovernmental organizations (NGOs) to engage in outreach to members of Congress outside of regularly scheduled hearings. This team should be devoted to informing Congress of the national security benefits associated with CTR cooperation, especially with the Russian Federation. This team should also highlight that CTR takes up a relatively small portion of the defense and water and energy budgets.

In addition, Congress often passes legislation on funding devoted to foreign assistance. These laws and amendments ensure that assistance provided by the U.S. government is conditional; at times, these conditions can detract from cooperation possibilities. President Bush's de-certification of Russia as compliant with the Chemical and Biological Weapons Conventions serves as an example. In order to encourage Russia to be more transparent with the United States regarding its chemical and biological weapons programs, President Bush canceled this certification, which is a prerequisite to receiving security assistance. However, the conditionality clause written into this legislation combines chemical and biological weapons

matters with nuclear issues. Therefore, due to the framing of this legislation, Bush's decision threatened to cut off all funds and technical assistance devoted to nuclear CTR due to complications between the Russian and American chemical and biological teams.

Policy Recommendation 8:

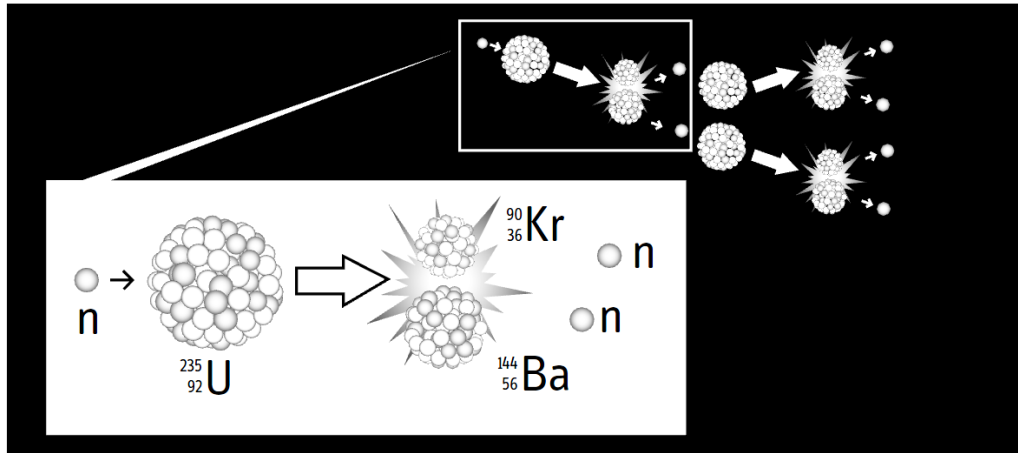
The U.S. government (both Congress and the executive branch) should prevent the adoption of linkage policies as much as possible. Nuclear CTR has been a vital part of the United States' and Russia's national security since 1991, serving a critical role in the nonproliferation and counterterrorism strategies of both nations. During the Clinton-Yeltsin years, CTR programs have remained insulated from the effects of political disagreements over NATO expansion and nuclear assistance to Iran. The proper method for addressing these issues is to engage the partner nation directly (such as how Clinton and Yeltsin did at the May 1995 Moscow summit), rather than through linkage. Especially given the MFA's position regarding non-renewal of the U.S.-Russian umbrella agreement in 2013, linkage between CTR and other policies will prove to be an inefficient solution to these policy issues. Any stoppage of the CTR agenda is contrary to both nations' national security.

The domestic political climate also affected American ability to provide CTR support to Russian officials. For example, it influenced the budget amounts that the presidential administration will request from Congress, such as under Obama during the government debt debate. Despite Obama's 4-year effort to secure fissile materials, the Obama administration was forced to decrease its FY2012 request for CTR funds due to the highly constrained budget and the lack of political will for continuing high levels of expenditure on national defense spending.

In addition, the domestic situation in Russia also had an effect on CTR collaboration success rate. Yeltsin's tenure in the presidency was characterized by a highly dissenting and resistant Duma that sought to undercut Yeltsin's cooperative agenda with the United States. In sharp contrast to Yeltsin's rule by presidential decree, Putin enjoyed incredible popularity and support in the Duma, and could therefore rely upon its support for U.S.-Russian CTR plans, such as the Bratislava Initiative.

Appendix

Figure 1. Diagram of a fission chain reaction.¹⁴⁷



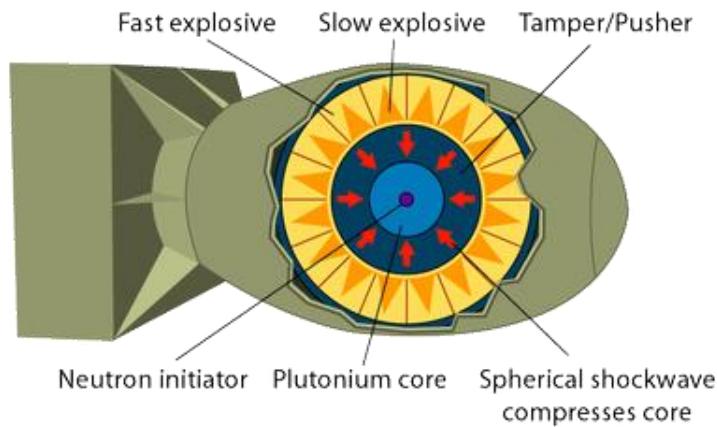
As the neutron collides with the fissile U-235 nucleus, it splits into two products and releases more neutrons, which then begin their own reactions. This is an example of a self-sustaining fission chain reaction.

Figure 2. Fissile Material Quantities Required to build a nuclear weapon

<u>Significant Quantities</u>		<u>Bare Critical Masses</u>		<u>Advanced Weapons Design</u>	
U-235 (in HEU)	25 kg	U-235 (in HEU)	52 kg	U-235 (in HEU)	12 kg
Pu-239	8 kg	Pu-239	10 kg	Pu-239	4 kg
U-233*	8 kg	U-233	16 kg		

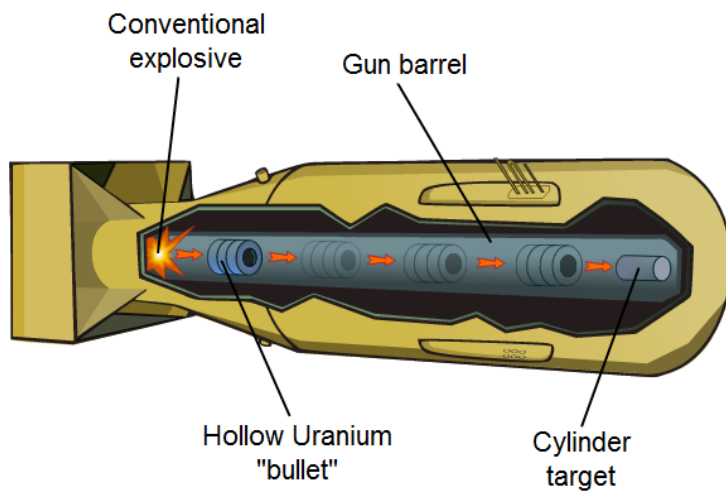
* U-233 is generally rarer than U-235 in weapons grade uranium stockpiles around the world. While U-233 is a fissionable material and theoretically a strong candidate for use in nuclear weapons, it is not naturally occurring, more difficult to manufacture than Pu-239, and is more difficult to handle in terms of radiation and storage safety. U-233 is manufactured through the process of neutron capture in thorium-232. If thorium-based fuels are widely adopted in the global nuclear industry, the stockpile of U-233 worldwide may significantly increase. It is widely published that there are no U-233 bombs in existing nuclear stockpiles.

Figure 3. Basic Design of an ‘Implosion’ Type Nuclear Weapon.¹⁴⁸



Tampers either surround the reflector or are designed to allow one casing to serve as both reflector and tamper. In a standard implosion device design, the tamper is placed between the reflector and the conventional explosives. After the conventional explosive ring detonates, the tamper compresses inward around the reflector and the fissionable core. Once the core reaches supercritical mass and begins to expand (due to the large amounts of heat produced by the reaction), the inward momentum of the compressing tamper temporarily counteracts the outward expansion of the fissionable core, thus maintaining supercritical density for a longer period of time. This results in a greater percentage of the total fissionable core actually undergoing the process of nuclear fission, rather than being destroyed by the subsequent energy release.

Figure 4. Basic Design of a ‘Gun Barrel’ Type Nuclear Weapon.¹⁴⁹



In this gun barrel type device, one sub-critical piece of fissile material is fired at another. The subsequent increase in density creates the supercritical conditions of a self-sustaining chain reaction. The only challenges for a terrorist to build this type of device would be component assembly, proper metallurgy of components, and test-firing the conventional explosive mechanism to ensure that the projectile is fired accurately and with sufficient speed.

Figure 5. Funding for the MPC&A Strategic Rocket Forces project.¹⁵⁰

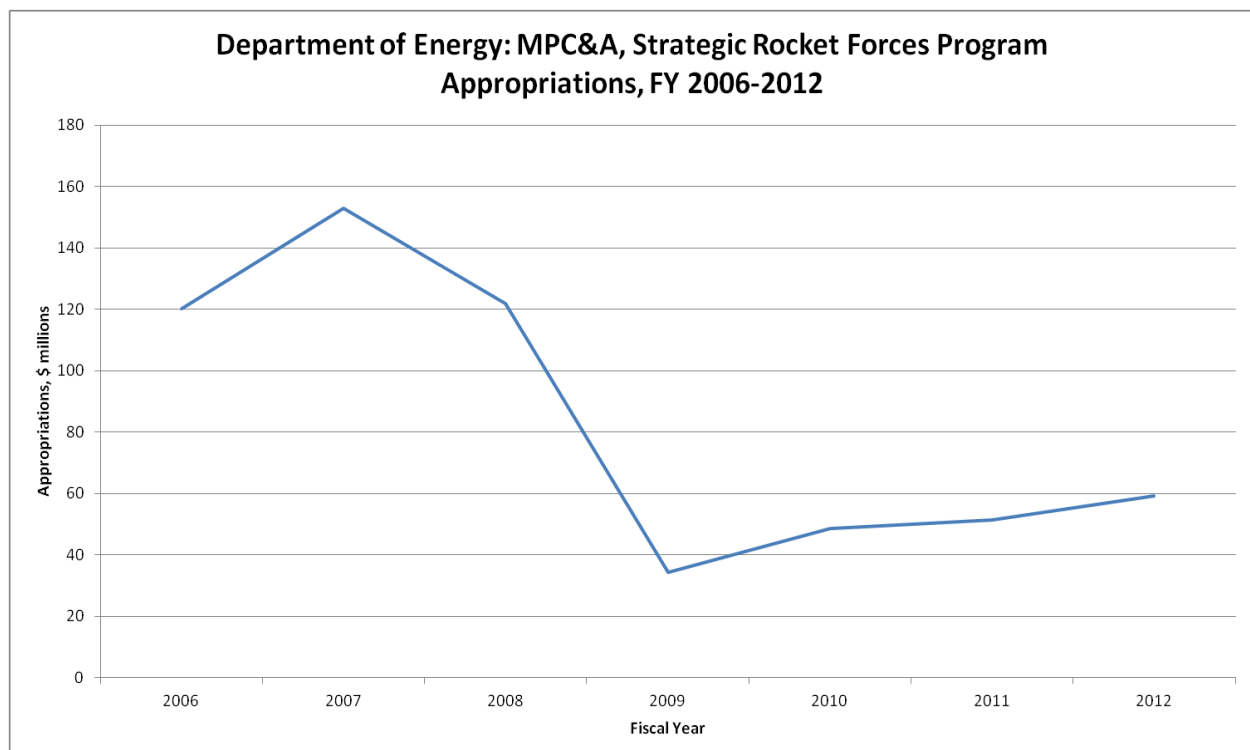


Figure 6. Funding for the DOD-CTR program.¹⁵¹

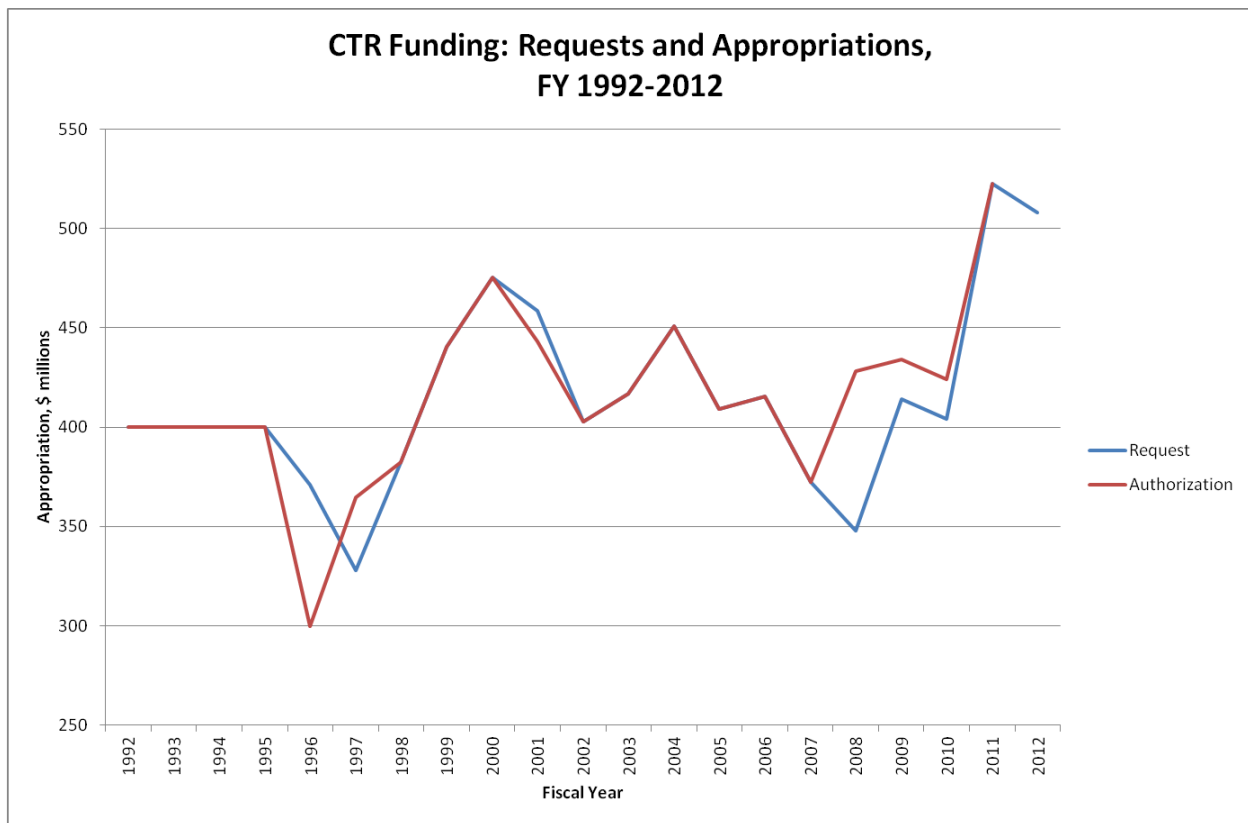
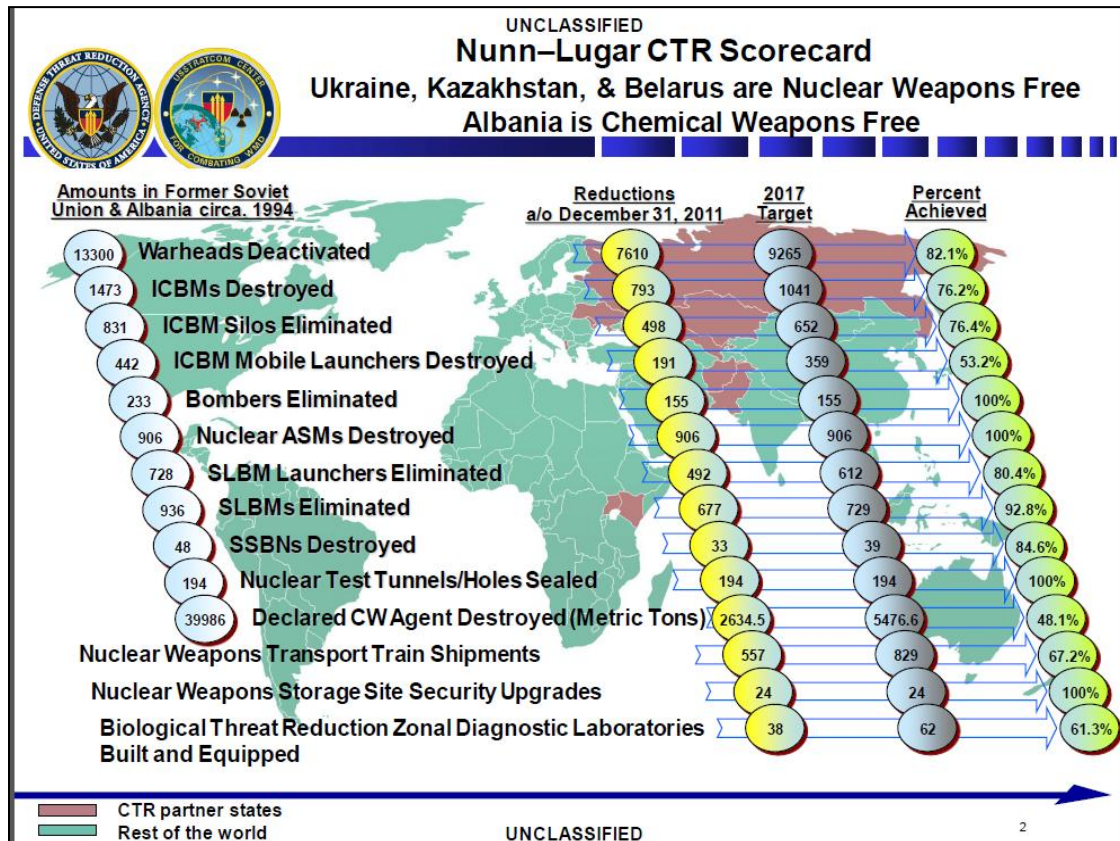


Figure 7. The Nunn-Lugar Scorecard.

The Nunn-Lugar Scorecard represents a running total of the achievements of the DOD-CTR program around the world.



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