END OF AN ERA

The United States, Russia, and Nuclear Nonproliferation

Edited by Sarah Bidgood and William C. Potter

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INTRODUCTION

US-Russian cooperation on nuclear nonproliferation has reached an inflection point. Policy makers in both capitals must now decide whether the risks posed by the spread of nuclear weapons are great enough to merit their renewed engagement—or whether the challenges in their bilateral relationship make it impossible to collaborate in this vital but often contentious sphere.

The election of President Joseph R. Biden offers the potential for a more pragmatic US approach to nuclear cooperation with Russia—one aimed at reducing the mutual threats perceived by both countries. At the same time, however, it is clear that both the Biden and the Putin administration will face considerable domestic political and/or bureaucratic opposition should they choose to revive their joint work in the nuclear sector and attempt to insulate it from other major problems that have plagued their relationship.[1] Although the issue of domestic opposition to any form of cooperation may be more visible in the United States due to very vocal congressional critics, one should not assume that President Vladimir Putin has a free hand—or the inclination—to restore the kind of US-Russian nuclear collaboration that previously characterized the superpower relationship. Indeed, in the view of Dmitri Trenin, the director of the Carnegie Moscow Center, the Biden administration's "openly supportive" attitude toward the "Kremlin's domestic opponents" will keep the Kremlin "on its guard," although he remains optimistic that joint action on nonproliferation may nevertheless prove possible.[2]

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[1] A senior administration official was quoted as saying on January 21, 2021, that the new administration will seek to "work with Russia" while at the same time holding "Russia accountable for their reckless and aggressive actions that we've seen in recent months and years." John Hudson, "Biden administration to seek five-year extension on key nuclear arms treaty in first foray with Russia," *Washington Post,* January 21, 2021, https://www.washingtonpost.com/national-security/biden-russia-nuclear-treaty-extension/2021/01/21/4667a11e-5b40-11eb-aaad-93988621dd28_story.html.

[2] Dmitri Trenin, "Dealing with Biden's America," Carnegie Moscow Center, February 8, 2021, https://carnegie.ru/commentary/83829.

To manage these competing domestic and international security pressures successfully, the new US administration will need to chart a nonproliferation course that avoids the political landmines that litter the bilateral landscape while convincing decision makers in Moscow of the value of restoring at least some aspects of those former terms of engagement that served the interests of both sides well. If Washington and Moscow are to succeed in these efforts, the Biden administration will need to demonstrate credibility, trustworthiness, and respect at the same time it makes clear to its Russian counterpart that a return to nonproliferation cooperation will require constructive behavior on both sides. On the one hand, this task is made more difficult by the disastrous arms control and nonproliferation legacy of its predecessor. On the other hand, the state of disarray inherited by President Biden provides an opportunity for even modest cooperative measures in the nuclear sphere to begin the process of shifting the trajectory of US-Russian relations in a positive direction.

In the interval since the publication *Once and Future Partners: The United States, Russia, and Nuclear Non-proliferation* in 2018, the United States has left or threatened to leave most bilateral and multilateral nonproliferation and arms control agreements. It has:

- withdrawn from the Intermediate-Range Nuclear Forces (INF) Treaty over concerns about noncompliance, precipitating the treaty's collapse;
- withdrawn from the 2002 Open Skies Treaty, prompting Russia to announce its intention to follow suit;
- abrogated the Joint Comprehensive Plan of Action (JCPOA), enabling Iran to disregard JCPOA restraints on enriching uranium; and
- threatened to "unsign" the Comprehensive Nuclear-Test-Ban Treaty and resume nuclear testing.

The previous US administration also expended valuable time and political capital pursuing a trilateral arms control agreement with China rather than supporting the bilateral extension of the New Strategic Arms Reduction Treaty (New START)—despite Beijing's clear disinterest in engaging with Washington and Moscow on this issue. Fortunately, this misstep was corrected shortly after the presidential transition, and the treaty will remain

in place for another five years. Nevertheless, overall disengagement by US and Russian arms control negotiators during the past four years has meant fewer opportunities for interaction at the working level on nuclear issues. This, in turn, has impeded the development of personal relationships and trust among interlocutors—historically an important contributor to successful nuclear negotiations.[3] It also has hindered the ability of each side to understand clearly the other's perceived nuclear threats, strategic priorities, and areas where a convergence of interests might enable the conclusion of further accords. Perhaps most importantly, the absence of routine interactions afforded by ongoing arms control and nonproliferation discussions has increased the risk of miscalculation and miscommunication with potentially catastrophic consequences.

If, as we concluded in *Once and Future Partners*, nonproliferation cooperation begets nonproliferation cooperation, then the last four years of arms control regression suggests that such discord also will make it all the more difficult to revive US-Russia nonproliferation collaboration. Nevertheless, there are compelling reasons on both sides to make concerted efforts to try. Chief among these is the fact that both countries have embarked on very costly programs to develop new weapon systems unconstrained by the existing arms control architecture. Deployment of these systems promises to lower the threshold for nuclear use and subvert whatever stability derives from the oft-cited "delicate balance of terror."[4]

At the same time, however, the US and Russian pursuit of these weapons further undermines the credibility of assurances by Moscow and Washington about their intent to implement fully their disarmament obligations under Article VI of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). Therefore, restoring cooperation within the NPT review process, where the breakdown in US-Russia relations has been on full display in recent years, should be a priority for the new Biden administration. If the NPT is to remain the cornerstone of the nonproliferation regime, as both Washington

[3] On this point see Rose Gottemoeller, *Negotiating the New START Treaty* (Amherst, NY: Cambria Press, 2021).
[4] See Albert Wohlstetter, "The Delicate Balance of Terror," *Foreign Affairs,* January 1959, pp. 211-234.

and Moscow insist it must, it will be essential for the two sides to set aside their caustic rhetoric and identify practical ways to reinforce key elements of the treaty as they often have done in the past. If they are unwilling or unable to do so—and are perceived as not making good-faith efforts to fulfill their Article VI obligations—it will increase the likelihood that some non-nuclear states parties may exercise their right to withdraw from the treaty. Although few of these states are likely to take such dramatic action, the possibility cannot be totally excluded, especially if it proves impossible to revive the JCPOA. How the nuclear-weapon states respond to the January 2021 entry into force of the Treaty on the Prohibition of Nuclear Weapons, which has the support of almost all NPT members other than the nuclear-weapon states and their allies, also has the potential to affect the integrity of the NPT.

Resumption of US-Russian cooperation for nonproliferation is relevant to a number of pressing nuclear challenges beyond the direct purview of the NPT, however. They include the urgent need to tackle regional security issues, including those emanating from the Korean Peninsula and the Middle East. At least a modicum of US-Russian collaboration is probably essential if headway is to be made in preventing North Korea's further nuclearization, containing Iran's nuclear ambitions (as well as those of Saudi Arabia), strengthening the nuclear export control and safeguards regimes, and eliminating the prospect of high-consequence nuclear terrorism. The existential threat posed by climate change—and the imperative to pursue renewable energy sources—is another promising nuclear domain for US-Russian collaboration given the two countries' long history of promoting peaceful uses of nuclear energy and their shared concerns regarding its misuse. An objective convergence of interests, however, does not guarantee cooperation in their pursuit, and progress in this regard will require deliberate and persistent efforts in both Washington and Moscow.

The Biden administration has taken a positive first step in reversing the deterioration in US-Russian nuclear relations by acting in tandem with Russia to extend New START. It also has sought to reengage with Iran, albeit indirectly at first, which may enable the revival of the JCPOA. Russia strongly supports that nonproliferation arrangement, but its future remains very uncertain due to major opposition within both the United States and

Iran. While these are very welcome developments, it remains to be seen whether they foreshadow a more ambitious and wide-ranging program of US-Russia cooperation in the nuclear nonproliferation sphere of the kind that defined US-Soviet relations in the mid-1970s and 1980s and continued, albeit inconsistently, throughout the first decade of the post-Cold War era. For that to occur, the Biden and Putin administrations would do well to revive mechanisms for bilateral superpower nonproliferation cooperation that worked under similar prior circumstances of basic distrust, political animosity, and military competition.

The present collection of case studies identifies a number of these past collaborations and derives lessons from them to inform contemporary decision makers in both capitals who may recognize the risks of the current situation but are wary of initiating major departures from past practice. In deriving both lessons and recommendations, this volume examines seven cases of successful US-Russian cooperation during the post-Cold War era. Many of the case studies draw extensively on interviews with Russian and American policy makers about the drivers behind cooperation and the mechanisms that sustained it. They examine questions such as these:

- Can non-legally binding measures in the form of parallel unilateral initiatives facilitate a return to cooperation on nuclear issues between Washington and Moscow?
- Do other existential threats—such as climate change—intersect with nuclear dangers in ways that might benefit from US-Russia cooperation (for example, in the sphere of peaceful nuclear energy)?
- What areas of US-Soviet and US-Russian engagement in the past are most relevant today given the demise of traditional arms control? Could nuclear risk reduction offer useful opportunities for collaboration as it did during the Cold War?
- How will changes in US and Russian attitudes toward international nonproliferation organizations limit or expand the forums in which the two countries can cooperate in the future?
- To what extent can US-Russia cooperation make a difference in mitigating regional security challenges, including those in the Middle East?

- What opportunities exist for US-Russian nonproliferation cooperation on technical issues, such as those involving export controls, minimization of the possession and use of highly enriched uranium, and promotion of best practices in nuclear security?

The advent of the Biden administration provides a welcome and necessary occasion for undertaking a wide-ranging assessment of areas where contemporary US and Russian interests align, including—indeed, especially—in the nuclear domain. While it is difficult to anticipate the outcome of this assessment at a time when there are countervailing pressures to take further punitive actions against Russia for a variety of real and alleged misdeeds, a strong case can be made that the two countries are doomed to cooperate.[5] Although at the time of this writing, President Biden had yet to detail fully his foreign policy objectives or his administration's nuclear posture, he previously acknowledged that "Washington must keep the channels of communication open with Moscow" regardless of policy differences.[6] This volume seeks to identify topics in the nonproliferation sphere that merit US-Russian discussions and to provide suggestions about specific cooperative measures that might usefully be negotiated.

[5] Siegfried Hecker, quoting former Russian First Deputy Minister of Atomic Energy Lev Ryabev, popularized the use of this phrase as a characterization of the US-Russian nuclear relationship. See Siegfried S. Hecker, *Doomed to Cooperate: How American and Russian Scientists Joined Forces to Avert Some of the Greatest Post-Cold War Nuclear Dangers* (Los Alamos, NM: Bathtub Row Press, 2016).

[6] Joseph R. Biden, Jr. and Michael Carpenter, "How to Stand Up to the Kremlin: Defending Democracy Against Its Enemies," *Foreign Affairs,* January/February 2018, https://www.foreignaffairs.com/articles/russia-fsu/2017-12-05/how-stand-kremlin.

CHAPTER ONE

US-Russian Cooperation to Improve Security for Nuclear Weapons and Materials

Matthew Bunn

The cooperation the United States and Russia carried out from 1991 to 2014 to improve security for nuclear weapons and weapon-usable nuclear materials represents a remarkable example of nonproliferation cooperation in sensitive areas of national security. The cooperation led to dramatic improvements in security for nuclear stockpiles in Russia and the other states of the former Soviet Union, improving US, Russian, and global security by reducing the risk that terrorists or proliferating states might be able to acquire nuclear weapons or the materials needed to make them.[1] Hundreds of participants in both Russia and the United States deserve enormous credit for their brave, creative, and difficult work to make this cooperation succeed.

[1] To date, there are no full histories of this cooperation. The most detailed information—though focusing primarily on the early lab-to-lab part of the nuclear security effort—can be found in Siegfried Hecker, ed., *Doomed to Cooperate: How American and Russian Scientists Joined Forces to Avert Some of the Greatest Post-Cold War Nuclear Dangers* (Los Alamos, NM: Bathtub Row Press, 2016), Vol. 1, pp. 291-513. For a good description of the government-to-government and lab-to-lab approaches in their early days, see Caitlin Talmadge, "Striking a Balance: The Lessons of U.S.-Russian Materials Security Cooperation," *Nonproliferation Review,* Vol. 12, No. 1 (March 2005), pp. 1-35. For an account of the US Department of Defense's work on securing Russian warhead storage sites and transports, and the construction of a major storage facility for fissile material from dismantled nuclear weapons, see Joseph P. Harahan, *With Courage and Persistence: Eliminating and Securing Weapons of Mass Destruction with Nunn-Lugar Cooperative Threat Reduction Programs* (Defense Threat Reduction Agency, 2014), pp. 227-301. This chapter draws in part on Matthew Bunn, "Cooperation to Secure Nuclear Stockpiles: A Case of Constrained Innovation," *Innovations: Technology|Governance|Globalization,* Vol. 1, No. 1 (Winter 2006), pp. 115-137. I am grateful to Mariana Budjeryn for her research assistance.

Nevertheless, for many in Russia—especially those who were not direct participants—this cooperation left a sour taste. In a sense, it framed Russia as a weak country that needed US help to manage its nuclear stockpiles. In Moscow, there are lingering concerns over the intrusion on secrecy: US experts ended up visiting most of Russia's nuclear weapon storage facilities and most buildings with separated plutonium or highly enriched uranium (HEU)—places that had, until then, been strictly off-limits to foreigners. And because the Americans paid for most of what was done, they tended to have more say about what would be done and how it would be done, in a way that Russian participants sometimes saw as unfair.

The cooperation proceeded in stages, with mistakes, breakthroughs, and learning along the way. Over time, the two sides worked together to mitigate Russian concerns, negotiating detailed access agreements that provided only enough access to confirm that agreed work was done and establishing working groups to make decisions jointly about what would be done next and how. Moreover, it is often forgotten that the access was not entirely one-sided: Russian experts also visited nearly all of the major facilities of the US nuclear weapons complex.

In the late 2000s, this cooperation slowed and became more difficult as Russia's economy stabilized, the most urgent nuclear security work was finished, Russia's security services began taking a larger role in Russian policy, and Russia's relations with the West soured. Ultimately, the joint work ground almost entirely to a halt when the United States cut off nuclear energy cooperation as part of the sanctions it imposed after Russia's annexation of Crimea and destabilization of eastern Ukraine in 2014 and Russia suspended nearly all nuclear security cooperation in response.[2]

[2] The exceptions were some cooperation with the Russian nuclear regulatory agency, Rostekhnadzor, and a handful of nuclear institutes not controlled by the Russian State Atomic Energy Corporation (Rosatom). See For summaries, with links to the original Russian statements, see Matthew Bunn, "Rebuilding U.S.-Russian Nuclear Security Cooperation," *Nuclear Security Matters,* January 22, 2015; and Matthew Bunn, "Russia Puts Positive Spin on Nuclear Security Cooperation—Which is Good," *Nuclear Security Matters,* January 23, 2015. In addition, the United States and Russia have continued to cooperate on returning Russian-origin HEU located in other countries to Russia.

Today, the particular kind of cooperation that took place in the past is no longer needed or appropriate. Russia does not need to rely on US taxpayers to pay for nuclear security improvements, and the Russian government has no desire to have Americans visiting many of its most sensitive nuclear facilities.

There is a strong case, however, for renewed cooperation on an equal basis, with each side paying for its own participation and bringing its own ideas. Achieving and sustaining excellence in protecting nuclear weapons, materials, and facilities from terrorists and thieves is a challenging mission. Issues include the complexities of the many types of nuclear materials and the wide range of processes taking place in the huge nuclear complexes of the United States and Russia, the large number of locations that have to be protected, the ever-evolving variety of tactics and capabilities adversaries might use to overcome defenses, and the ever-present difficulty of avoiding complacency in protecting against things that hardly ever happen. (For most nuclear guards, for example, every alarm they hear in their entire career will be either a test or a false alarm; it is natural to start assuming that will be the case when an alarm sounds.) Risks would be lower if the world's two largest nuclear complexes were still working together to meet these challenges. To return to some forms of nuclear security cooperation in the future, it will be important to learn the lessons of the past.

The rest of this chapter proceeds as follows: The next section will describe the various stages of US-Russian nuclear security cooperation, from its beginnings to its full flowering after the 2005 Bratislava summit. That will be followed by an assessment of lessons learned from that cooperation. The final section will outline potential approaches to renewing US-Russian nuclear security cooperation in the future.

Stages of US-Russian Nuclear Security Cooperation

Security for Nuclear Weapons and Materials Following the Soviet Collapse

The Soviet Union had a reasonably sensible system for securing nuclear weapons and materials. But it was based on a closed society, closed borders, nuclear workers who got the best of everything Soviet society had to offer, and close surveillance by the KGB of everyone involved.

In the years immediately following the collapse of the Soviet Union in 1991, all of that was gone. In the economic chaos that followed, facilities had little money for security, and workers sometimes went unpaid for months at a time. At many sites, there were urgent security weaknesses—gaping holes in fences; padlocks securing nuclear material areas that could be cut with a bolt cutter from any hardware store; simple, easily faked wax seals to indicate if material had been tampered with; a lack of detectors to sound an alarm if someone was carrying bomb material out in a briefcase. A classified study by the US Joint Atomic Energy Intelligence Committee concluded that there was not a single facility in the former Soviet Union that had "adequate safeguards and security measures" in place.[3]

In the early 1990s, as one of many examples, Building 116 at the Kurchatov Institute in Moscow contained enough HEU for a nuclear bomb. Outside, the fence around the building was almost completely overgrown with weeds. Inside, a guard with a pistol did little to check known and authorized workers as they went in and out.

As a result of such deficiencies, nuclear thefts began to occur. In 1992, a worker at the Luch Production Association stole a total of 1.5 kilograms of weapon-grade HEU, a small amount at a time over months, without detection. In 1993, there were multiple HEU thefts, including at least two from naval facilities. In 1994, there were multiple seizures in Europe, including several kilograms of HEU in a parked car in Prague and plutonium that showed up in Munich on a plane from Moscow.[4]

Most of these weaknesses, however, were not known to US experts when the Soviet Union first collapsed. The initial focus of US concern was getting the former Soviet nuclear weapons that had been left in Ukraine, Belarus,

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[3] In unclassified 1996 testimony, Director of Central Intelligence John Deutch described this conclusion as the result of a "comprehensive evaluation" by the intelligence community. See US Senate, Committee on Governmental Affairs, Permanent Subcommittee on Investigations, *Global Proliferation of Weapons of Mass Destruction,* Part II, 104th Congress, 2nd Session (March 13, 20, and 22,1996).

[4] For a good summary of seizures of stolen HEU and plutonium, see Lyudmila Zaitseva and Friedrich Steinhausler, *Nuclear Trafficking Issues in the Black Sea Region,* Non-Proliferation Paper No. 39 (Paris: EU Non-Proliferation Consortium, 2014), http://www.sipri.org/research/disarmament/eu-consortium/publications/non-proliferation-paper-39.

and Kazakhstan back to Russia and ensuring that there would only be one nuclear-weapon state resulting from the splintering of the Soviet Union, not several. Awareness of the real situation at Russian nuclear facilities grew slowly, as more US experts visited former Soviet nuclear facilities.[5]

1991-1993: Struggles to Begin Cooperation

In the fall of 1991, as the Soviet Union was in its death throes, Senator Sam Nunn (D-GA) and Senator Richard Lugar (R-IN) joined together to push a new, bipartisan initiative to work cooperatively with what would soon be the states of the former Soviet Union to secure and dismantle the deadly Cold War weapons that were no longer needed.[6] President George H. W. Bush signed the unprecedented initiative into law on December 12, 1991, weeks before the Soviet Union ceased to exist. Initially, the Department of Defense (DOD) Cooperative Threat Reduction (CTR) program, widely known as

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[5] The most compelling information came from Americans who began to visit Russian nuclear facilities—particularly as part of exchanges between the nuclear labs. Siegfried Hecker, then the director of the Los Alamos National Laboratory, reports that on his first visit to the nuclear weapon design laboratory in the town now known as Sarov (formerly Arzamas-16) in February 1992, he was "impressed" by the science, but "alarmed by the lack of an adequate system of security and safeguards for nuclear materials." Hecker, *Doomed to Cooperate,* Vol. 1, p. 291. In addition to the lab experts, Kenneth Fairfax, then the science and technology officer at the US Embassy in Moscow, sent a series of alarming cables describing the insecure conditions he observed at Russian nuclear facilities. Fairfax was the first American to get permission to go inside the plutonium production complex buried deep under a granite mountain in the town then known as Krasnoyarsk-26 (now Zheleznogorsk). Fairfax would later take on a National Security Council post overseeing cooperation on securing nuclear material. From outside the government, William C. Potter, director of what is now the James Martin Center for Nonproliferation Studies at the Middlebury Institute for International Studies at Monterey, along with Thomas Cochran and Christopher Paine at the Natural Resources Defense Council, played important early roles in highlighting the dangers posed by loose nuclear material, as did the team at what is now the Harvard Kennedy School's Belfer Center for Science and International Affairs.

[6] The ideas for Nunn-Lugar were drawn in part from Kurt M. Campbell, Ashton B. Carter, Steven E. Miller, and Charles Zraket, *Soviet Nuclear Fission: Control of the Nuclear Arsenal in a Disintegrating Soviet Union* (Cambridge, MA: Center for Science and International Affairs, Kennedy School of Government, Harvard University, November 1991). Carter and William Perry traveled to Russia with Nunn and Lugar and helped to draft the legislation.

Nunn-Lugar, provided both the institutional umbrella and the funding for US-Russian nuclear security cooperation. Later, the concept of cooperative threat reduction spread to other agencies, with the Department of Energy (DOE) handling much of the work on upgrading security and accounting for nuclear materials, as well as some of the work on security for nuclear weapons themselves.

Because US officials were not fully aware of the state of nuclear material security in Russia, cooperative work on nuclear "material protection, control, and accounting" (MPC&A) was among the early US Nunn-Lugar proposals, but it was not seen as an urgent, top-priority effort. Moreover, Nunn-Lugar took time to get moving: Congress did not appropriate any funds; it simply authorized DOD to move funds from other favored projects. To strengthen political support for this unprecedented effort, the initial legislation included "buy American" requirements and a long list of things the administration had to certify before spending money in the former Soviet states. Ultimately, the US government negotiated CTR "umbrella" agreements with each of the new states, then agreements on particular topics such as missile dismantlement, and then contracts for particular projects—meaning that it took some time to get work on the ground going.

On the Russian side, during 1991-1993, allowing US visits to any buildings at all with plutonium or HEU—even civilian ones—was considered too sensitive. Moreover, many Russian officials and nuclear security experts were unwilling to acknowledge the scope of the problems they faced—at least in government-to-government discussions. It is worth remembering that the purpose of most of the security measures at nuclear sites during Soviet times—then only a short time ago—was very different. There was little concern about insider theft of nuclear material or nuclear weapons: the people handling such items were closely watched by the KGB and would not be able to meet with a foreigner or travel abroad to sell such an item without KGB surveillance. And there was only modest concern about groups of armed terrorists attacking a nuclear facility, as the Soviet Union was a tightly controlled society where that was not considered a worrisome threat. Instead, the main goal of nuclear security measures in Soviet times had been keeping US spies from acquiring nuclear secrets. Convincing nuclear site

security managers whose whole careers had been in that system that having Americans crawling over their nuclear facilities was part of the answer to their nuclear security problems, and not part of the problem, took a lot of patient work—and step-by-step demonstration that the cooperation really could lead to substantial improvements.

At the same time, the early US proposals were focused only on installing US equipment and were tied up with multiple requirements from Washington, including complex procurement rules and demands for access to nuclear sites to confirm the work was needed and then that it was being done as agreed. Suspicion among nuclear officials on both sides was strong.

After some discussion, during 1993, the United States and Russia reached agreement on an initial plan that called for demonstrating modern MPC&A technology at two areas handling only low-enriched uranium (LEU). The idea was that over several years, Russian experts would apply the technologies and lessons learned from these sites at other, more sensitive locations.

1994-1997: Lab-to-Lab and Other Breakthroughs

By early 1994, the inadequacy of the plan to spend years working on MPC&A for LEU was becoming obvious, as reports of poor security and actual thefts accumulated. A January 1994 report from a committee of the National Academy of Sciences described the situation as a "clear and present danger."[7] Yet government-to-government efforts to move forward on work to improve security and accounting for actual plutonium or HEU, to improve security for stored nuclear weapons, and to build a storage facility for the fissile materials from dismantled nuclear weapons were almost at a standstill.

Working with Russian and US laboratory colleagues, Siegfried Hecker, the director of Los Alamos National Laboratory, developed a plan for lab-to-lab cooperation on MPC&A. (Lab-to-lab cooperation on science was

[7] Committee on International Security and Arms Control, National Academy of Sciences, *Management and Disposition of Excess Weapons Plutonium* (Washington DC: National Academy Press, 1994). I was the study director for this report.

already underway and that work had established personal relationships between key US and Russian laboratory leaders.) Hecker's plan was based much more on real partnership with Russian experts than US Nunn-Lugar approaches had been up to that point, including buying Russian equipment where appropriate, and more flexible approaches to the question of access to sensitive sites. Incoming Undersecretary of Energy Charles Curtis approved Hecker's idea and set aside some initial funds for the effort; Curtis was willing to use his personal credibility to go to Congress and explain the flexible access arrangements, making the case that protecting the United States from nuclear terrorism was more urgent than keeping track of every dollar.[8]

The US laboratory experts were quickly able to sign contracts with the Russian labs to begin work. Curtis and a team of lab experts traveled to Moscow in October 1994 and confirmed official approval for the cooperation on the Russian side. By December 1994, the first demonstration MPC&A system—for the aforementioned Building 116 at the Kurchatov Institute in Moscow —was displayed to a broad audience of Russian and US experts and officials. Demonstration systems at particular buildings at the nuclear weapon laboratory at Sarov (and another demonstration at Building 116) followed soon after the turn of the year.

Meanwhile, the government-to-government track was making progress as well. This may have been in part because the lab-to-lab efforts demonstrated that Americans were willing to engage in genuinely cooperative approaches, because both governments increasingly recognized the urgent need for action, or because the United States offered some reciprocity. In the summer of 1994, a Russian team led by Deputy Minister of Atomic Energy Nikolai Yegorov—Minatom's main Nunn-Lugar negotiator—visited the Hanford Site in Washington State to observe security arrangements for plutonium there, and a US team led by Frank von Hippel from the White House Office of Science and Technology Policy (OSTP) then visited the plutonium storage building at the Mayak Production Association, a giant plutonium and HEU facility in the city of Ozersk. Plans for government-to-government cooperation on upgrading MPC&A at initial sites with actual HEU or plutonium got

[8] Hecker, *Doomed to Cooperate,* Vol. 1, pp. 293, 321-325.

underway.[9] The Department of Energy (DOE) established an MPC&A task force led by Kenneth N. Luongo—who was rarely afraid to rattle the cages of the traditional bureaucracy to move these efforts forward—with lab-to-lab and government-to-government efforts working in parallel.

These efforts began to expand rapidly, from $2 million in fiscal year 1994 to over $100 million in fiscal 1997. Partnership was the essence of the effort: US and Russian experts genuinely respected each other and worked together as equals (though with the financing mainly coming from the US side), implementing ideas from both sides, and working together on cooperative research-and-development (R&D) projects on improved approaches. When the lab experts came to a common understanding on a particular proposal, the US experts worked to get US government approval and the Russian experts worked to get Russian government approval.

Soon, the US and Russian lab-to-lab teams developed a proposal for implementing upgrades for security and accounting throughout the Russian nuclear complex. At the same time as these bottom-up efforts were expanding, these issues began to be discussed at the highest levels, especially in the "Gore-Chernomyrdin Commission," established in 1993, in which US Vice President Al Gore and Russian Prime Minister Viktor Chernomyrdin oversaw a series of working groups—including, ultimately, one on nuclear energy and security cooperation—to push cooperation forward and overcome obstacles.

Working from OSTP, I was among several experts at the White House seeking to provide support and help clear the path for this work. I served as the principal staff member for a committee that carried out a classified study of the problem of inadequately secured nuclear materials and what was being done to address it, completed in early 1995.[10] That study led

[9] Frank von Hippel, "Fissile Material Security in the Post-Cold War World," *Physics Today,* Vol. 48, No. 6 (June 1995), pp. 26-31.

[10] Panel on U.S.-FSU Cooperation to Protect, Control, and Account for Weapons-Usable Nuclear Materials, President's Committee of Advisors on Science and Technology, *Securing Weapons-Usable Nuclear Materials in the Former Soviet Union: Urgent Measures to Prevent Nuclear Proliferation* (Washington DC: Office of Science and Technology Policy, March 28, 1995). (This study remains classified.)

to Presidential Decision Directive 41, which laid out "an accelerated plan to improve the security of nuclear materials," and formally gave DOE primary responsibility.[11]

Work on MPC&A for the Russian military's stockpiles was one especially important expansion of the original efforts. The Kurchatov Institute had long been the main nuclear institute supporting the Russian navy, designing and servicing reactors, providing training, and more. The institute's vice president, Nikolai N. Ponomarev-Stepnoi, invited Russian navy personnel to witness the demonstration of the first MPC&A system at Kurchatov's Building 116. Before long, Ponomarev-Stepnoi received a letter from Admiral Feliks Gromov, commander in chief of the Russian navy, suggesting that the navy and Kurchatov cooperate on MPC&A, possibly with the Americans involved as well. Getting interagency approval on the US side took some time, but by 1996, the two sides had agreed on initial projects and begun work to upgrade security at Site 49 at Sevoromorsk, a location with a large amount of HEU naval fuel.[12] The navy work soon expanded to cover all of the Russian navy's HEU sites (including a major consolidation of that HEU to fewer locations), becoming one of the largest and most successful parts of the MPC&A program.

An important element of the navy program's success was that it was a Russian initiative, and the Russians took ownership of it. The Kurchatov Institute acted as the integrating contractor, with the money flowing through the institute's accounts. As a result, Kurchatov experts—who had Russian security clearances and were long-time partners of the Russian navy—had a strong incentive to work the Russian system to move the effort forward, in ways the Americans would never have known. At the same time, the key people leading the navy work on the US side—a small and consistent team the Russians came to know and trust—managed to demonstrate that they

11 White House, "Clinton Directive Aims to Further Reduce Nuclear Threat," September 28, 1995, https://fas.org/irp/offdocs/pdd41.htm.
12 See Mark Mullen, "From Lab-to-Lab to the Russian Navy," in Hecker, *Doomed to Cooperate,* Vol. 1, pp. 411-415.

would work in genuine partnership and would be sensitive to Russian secrecy concerns.[13]

But as MPC&A cooperation grew and attracted more high-level attention, greater scrutiny and pressures for standardization were perhaps inevitable. The initial efforts were quite freewheeling. Put together on an emergency basis, they pursued upgrades of particular interest to the particular US and Russian experts working at each site, with few standardized procedures or standardized approaches to MPC&A improvements. At one Russian nuclear site, experts from three different US national laboratories advocated four different computerized material accounting systems. In Russia, as more US visitors went to more facilities, the concerns of the Federal Security Service (FSB), the domestic successor to the KGB, were growing. In the United States, concerns over whether all this was reducing risk in the most efficient possible way, whether money might be diverted, and whether the cooperation was effectively subsidizing the Russian nuclear enterprise were also growing.

1997-1999: Bureaucratization, a Warhead Breakthrough, and the Sustainability Crisis

In 1997, these concerns led, effectively, to the end of the lab-to-lab approach as governments on both sides instituted top-down control. Luongo, Curtis, von Hippel, and I had all left the government, and Mark Mullen of Los Alamos, who had headed the lab-to-lab team at DOE, had gone back to the lab. Officials at DOE decided to consolidate the lab-to-lab and government-to-government programs in a single effort, with DOE program managers, rather than laboratory experts, in the lead. Lab-to-lab MPC&A as it once had been ceased to exist. The new DOE team also decided to develop standardized approaches to upgrades based on the type of material to be protected. These standards were developed without Russian input, and DOE officials instructed US team leaders for particular sites to tell their Russian counterparts that some of the upgrades they had agreed to before were no

[13] For discussion of this topic, see Oleg Bukharin, Matthew Bunn, and Kenneth N. Luongo, *Renewing the Partnership: Recommendations for Accelerated Action to Secure Nuclear Material in the Former Soviet Union* (Washington, DC: Russian-American Nuclear Security Advisory Council, August 2000), pp. 60-61. See also Hecker, *Doomed to Cooperate,* Vol. 1, pp. 405-440.

longer acceptable because they did not fit the new US standards—which the Russian experts were not even allowed to review. This seriously undermined the sense of partnership.

Then came another blow, this time on access. With approval from DOE, the lab-to-lab leaders had worked out flexible arrangements for confirming that the work agreed to had been done. For the most sensitive sites, these did not involve US personnel actually visiting to see but relied instead on photographs, records of equipment use, and the like to confirm that Russian experts had installed the equipment as agreed. Remarkably, using such methods, the lab-to-lab effort had managed to begin installing important upgrades at Russia's "serial production facilities"—the sites that assembled and disassembled nuclear weapons, which Russian officials had always made clear would be off-limits to Americans.[14]

When the new managers at DOE headquarters consolidated control of the lab-to-lab and government-to-government programs, however, they decided to insist that there would be no US funding for any project where Americans could not have direct access. This was directly contrary to what had been agreed and betrayed the many Russian experts who had gone out on a limb with their security services to move these efforts forward, arguing that the Americans would be reliable partners. As a result, the work at the serial production facilities ended abruptly, never to resume—and MPC&A work at many sites slowed, while the two governments pursued their dispute over access.[15]

Of course, while all this had been happening on the US side, security officials at Minatom and at the FSB had not been sitting on their hands. They were also asserting greater centralized control over interactions with US experts on MPC&A. Cooperation was becoming more difficult and more

[14] These upgrades remain somewhat sensitive on the Russian side to this day. For very brief discussions of them, see Hecker, *Doomed to Cooperate,* Vol. 1, p. 336.

[15] For a detailed criticism of these actions, see Bukharin, Bunn, and Luongo, *Renewing the Partnership.* (These actions were the motivation for the title of that report—a belief that the partnership approach needed to be renewed.) See also Hecker, *Doomed to Cooperate,* Vol. 1, pp. 328-329, 336-337.

bureaucratized—though also, arguably, more focused on addressing the highest-priority risks in a consistent way across all sites.

Fortunately, these events did not end all the work that had previously been under the lab-to-lab rubric. Much of that work continued, and funding continued to increase. The navy work, in particular, continued successfully. The trust that the US Navy MPC&A team, led by Byron Gardner of Sandia, managed to build was crucial in launching the next step. In September 1998, without authorization from anyone, Gardner arranged to meet with Admiral Nikolai Yurasov, the lead official overseeing the work on the Russian side, in a bar in Moscow.[16] After some discussion of the successful work underway, Gardner suggested that the next step would be to work together to improve security for the navy's nuclear weapons. (While the United States was providing a variety of equipment to improve security for warhead transports, government-to-government efforts to upgrade warhead storage security were largely at a standstill, in part because of US demands for access.) Yurasov pounded his fist on the table, and Gardner thought he was angry—but it turned out he was pounding his fist because he thought the idea was so important. Gardner outlined an approach to cooperation in this sensitive area, including an approach to confirming the work was done as agreed without revealing too many Russian secrets. Yurasov said that this idea was so sensitive they could not communicate about it by phone or email. He agreed to check with Admiral Vladimir Kuroyedov, then the commander of the Russian navy, but said Gardner would get an email that only said "nyet" or "da." Soon, Gardner got an email that said "da"—and then had to explain to DOE what he had proposed.[17]

Fortunately, the US government approved the approach, despite considerable unhappiness over Gardner short-circuiting government processes. That is how the logjam on cooperation on nuclear warhead storage security was broken. Work soon got underway, and eventually, the other nuclear-armed branches of the Russian military and the 12th Main Directorate of the Ministry of

16 Two other people from the US side were there—Roy Fitzgerald, a Sandia procurement official, and interpreter Andre Krakov (who did much more than interpret). Yurasov was accompanied by his deputy, Captain First Rank Yuri Goncharenko.

17 Gardner recounts this story briefly in Hecker, *Doomed to Cooperate,* Vol. 1, p. 425.

Defense (the 12th GUMO, in its Russian acronym, responsible for managing and securing Russia's nuclear weapons) saw what the navy was accomplishing with US help and decided they wanted to cooperate as well.

Long before Gardner's initiative, DOD had been working with Russia on nuclear warhead security, having provided armored blankets and "supercontainers" to help with secure transport of weapons back to Russia. But work on upgrading security at storage sites had been slowed because of difficulties over access to those sites—whose locations were state secrets in Russia. The year before Gardner's initiative, at the April 1997 Helsinki summit between US President Bill Clinton and Russian President Boris Yeltsin, Colonel-General Yevgeniy Maslin, then commander of the 12th GUMO, and General Roland Lajoie, then leading CTR program implementation at DOD, agreed on a "quick fix" project to perform rapid upgrades at 50 Russian nuclear weapon sites. The project involved providing miles of fencing, hundreds of sensors, alarms, and microwave systems.[18]

Unfortunately, though DOD delivered the equipment for the quick fix, disputes over access made installation anything but quick—much of the equipment was still sitting in warehouses years later.[19] But after Gardner's proposal, DOD also managed to reach an agreement with the Russians on an access approach, which involved placing a camera in a locked box that would be sealed under joint US-Russian custody at some distance from a storage site. During a US audit, the box would be unlocked, and the camera would be handed to a Russian officer, who would take photos of the fencing and other equipment installed under the program; the photos would later be reviewed by the US auditors. [20] When it was necessary to confirm something inside a facility where US personnel could not go, they would often hand their Russian counterparts a unique object, which would then be included in the photographs taken of the installed equipment, confirming that those

18 Harahan, *With Courage and Persistence,* p. 267.
19 Matthew Bunn and Anthony Wier, *Securing the Bomb: An Agenda for Action* (Washington, DC: Nuclear Threat Initiative and Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, May 2004), pp. 52-53 ("Warhead Security: The Saga of the Slow 'Quick Fix'").
20 Harahan, *With Courage and Persistence,* p. 268.

photographs were taken at that place at that moment. In 1998, the quick fix effort was expanded to another 73 nuclear warhead facilities that came into the custody of the 12th GUMO as a result of a reorganization in the Russian nuclear forces.[21]

DOD and DOE worked together extensively on nuclear weapon security projects. One important effort was the Automated Inventory Control and Management System for the 12th GUMO, designed to account for and track nuclear warheads.[22] Another especially important initiative was the Security Assessment and Training Center (SATC) at Sergiev Posad near Moscow designed to test security systems and train security personnel for nuclear sites. The SATC opened in 1999; ultimately, an additional center was established for the Russian Far East.[23]

The next dramatic event that changed the picture was the financial crisis Russia suffered in 1998-1999. The value of the ruble plunged, the government budget was in disarray, and the funding for many nuclear sites was interrupted. Nuclear workers went unpaid for months at a time; electricity at some sites—including the power for the security systems—was shut off for nonpayment; guards left their posts to forage in the forest for food.[24]

These events provoked two responses on the US side. First, DOE rushed emergency assistance to some sites—literally providing items such as diesel backup generators or warm winter uniforms so guards could patrol outside. More importantly, DOE began to focus much more on the "sustainability" of US-sponsored upgrades. It seemed that the idea that Russia would be able to fund all the necessary upkeep and maintenance of the new MPC&A systems

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[21] Harahan, p. 267.
[22] Harahan, pp. 268-269.
[23] Harahan, pp. 270-272.
[24] For a list of alarming incidents from this period, see "Anecdotes of Nuclear Insecurity," in Matthew Bunn, Anthony Wier, and John P. Holdren, *Controlling Nuclear Warheads and Materials: A Report Card and Action Plan* (Washington, DC: Nuclear Threat Initiative and Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, March 2003), pp. 166-178.

once they were installed might not be correct. What would happen when these systems were completed and US funding phased out?

This focus on sustainability led to further emphasis on several things that had already been underway. This work included ensuring that Russia had effective regulations and enforcement in place, so that sites would be required to maintain reasonable security and accounting systems; beefing up training programs to provide the personnel needed to operate and maintain these systems; strengthening "security culture," the degree to which all personnel took security seriously and worked to improve it; and building up the ecosystem of Russian facilities and contractors that could help design, build, test, and maintain MPC&A systems. DOE also began working with Russian sites to lay out specific plans for how their MPC&A programs would be funded as US assistance phased out in the future.

2000-2004: Growing Tensions and Post-9/11 Pressures for Action

Ultimately, Russia's nuclear security system managed to weather the financial crisis of 1998-1999. Cooperation continued, but tensions were growing. Vladimir Putin took power as president of Russia in 1999, and the security services gained power. While Russian site-level experts were still eager to cooperate with their US counterparts—and to get financial support for their security improvement efforts—from the point of view of Russian central government officials, the new US "do it our way, since it's our money" approach made the cooperative program less attractive, and the US demands for access were an ongoing irritant. From a US government perspective, the growing bureaucratic difficulties on the Russian side—over tax and customs exemptions, liability provisions, slow review and approval procedures for contracts, difficult processes for certification of equipment, the ever-present access issue, and more—made the Russian government seem an obstacle to cooperation.

When the George W. Bush administration took office in early 2001, its members were skeptical of many elements of the cooperative threat reduction effort. The administration undertook a comprehensive review, with an eye toward cutting funding. Secretary of Defense Donald Rumsfeld

wrote a memo proposing that Nunn-Lugar efforts be moved out of DOD entirely. Bush declined to certify that Russia was meeting congressional requirements for receiving Nunn-Lugar assistance—including compliance with arms control agreements—and that held up funding for a substantial period and called the future of cooperation into doubt. John Bolton, the undersecretary of state for arms control and international security, insisted that any renewal of the CTR agreement or any agreements on plutonium disposition and other issues should have the same extreme liability provision Russia had agreed to in 1992—which made Russia liable for anything that went wrong in the cooperation, even in the case of intentional sabotage by US personnel.[25]

Then both sides—especially the Americans—were shaken by the terrorist attacks of September 11, 2001. Suddenly, the possibility that terrorists might be capable of the nuclear level of violence seemed much more real. Moreover, on the Russian side, the brutal fighting of the second Chechen war highlighted similar dangers. When Chechen terrorists seized a Moscow theater in 2002, the Russian state newspaper, *Rossiskaya Gazeta,* reported that they had first considered seizing a reactor at the Kurchatov Institute. Colonel-General Igor Valynkin, commander of the 12th GUMO, reported that terrorist teams had been carrying out reconnaissance at Russian nuclear weapon storage sites—whose locations were secret—and *Rossiskaya Gazeta,* reported additional incidents of terrorists carrying out reconnaissance on nuclear weapon transport trains.[26] A 2003 Russian court case revealed that a Russian businessman had been offering $750,000 for stolen weapon-grade plutonium, which he planned to sell to a foreign client. After 2001, US intelligence began to uncover the full extent of al-Qaeda's nuclear efforts—including carrying out crude but sensible conventional explosive tests in the

25 As a result of this insistence, the Nuclear Cities Initiative and the Warhead Safety and Security Exchange expired in 2003-2004, and there were considerable difficulties negotiating an amendment to the plutonium disposition agreement, which was not finalized until 2010, under the Obama administration.

26 Simon Saradzhyan, "Russia: Grasping the Reality of Nuclear Terror," *Annals of the American Academy of Political and Social Science,* Vol. 607, No. 1 (2006), pp. 64-77.

Afghan desert before the 9/11 attacks.[27] Then, in 2004, Russia suffered its most brutal terrorist attack yet, when Chechen terrorists seized a school in the town of Beslan, threatening to massacre both children and adults unless their demands were met. Russian forces tried to rescue the hostages, and by the end, over 300 people, more than half of them children, were dead. The urgency of keeping nuclear weapons and the materials that could be used to make them out of terrorist hands seemed clearer than ever.

Congress then moved to reverse proposed budget cuts for nuclear material security programs and increase funding instead. The Bush administration, to its credit, also reversed course and requested expanded funding for nuclear security work, not only in Russia but in other countries around the world. The administration also took a number of steps to strengthen the international architecture for nuclear security cooperation. First, it joined with the nongovernmental Nuclear Threat Initiative in providing what became the founding gifts of the International Atomic Energy Agency's Nuclear Security Fund. The administration then worked with other countries in the Group of Eight to launch the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction in 2002, with pledges of $10 billion from the United States and another $10 billion from the other participants over 10 years (initially with a focus on threat reduction work in Russia, including nuclear security). Then, in 2004, the administration launched the Global Threat Reduction Initiative, focused on removing weapon-usable nuclear material from potentially vulnerable locations around the world (especially HEU at civilian research reactors); this became a major area of US-Russian cooperation, working to bring HEU from Soviet-supplied reactors in other countries back to Russia to be blended down to LEU. Also in 2004, the Bush administration worked with Russia and other UN Security Council members to pass UN Security Council Resolution 1540, legally obligating all states to put various

[27] Rolf Mowatt-Larssen, "Al Qaeda Weapons of Mass Destruction Threat: Hype or Reality?" (Cambridge, MA: Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2010); David Albright, *Peddling Peril: How the Secret Nuclear Trade Arms America's Enemies* (New York: Free Press, 2010), pp. 169-184.

nonproliferation controls in place, including "appropriate effective" security and accounting for nuclear weapons and materials.[28]

Meanwhile, post-9/11 fears drove a new sense of urgency—and expanded funding for nuclear security—at the then-new National Nuclear Security Administration (NNSA), which by then had by far the largest programs to work with Russia on nuclear security. A new set of managers for the NNSA nuclear security took a somewhat more partnership-based approach, and a joint US-Russian committee was established to discuss and plan the next steps in the cooperation.

But the pace of progress in Russia remained slow. As noted earlier, equipment for quick fix security upgrades for Russian nuclear warhead sites languished in warehouses, uninstalled.[29] The cooperation succeeded in upgrading security for less nuclear material in the two years after the 9/11 attacks than in the two years before.[30] In a 2004 report, my colleague Anthony Wier and I pointed out that at the pace achieved in fiscal year 2003, it would take another 13 years to finish the security upgrades—a pace that in that time of post-9/11 fear, seemed obviously too slow.[31] This became an issue in the

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28 For the founding gift of the Nuclear Security Fund, see Charles B. Curtis, "Reducing the Nuclear Threat in the 21st Century," paper presented at the Symposium on International Safeguards: Verification and Nuclear Material Security, International Atomic Energy Agency, Vienna, October 29, 2001, https://www-pub.iaea.org/MTCD/publications/PDF/ss-2001/PDF%20files/Session%201/Paper%201-04.pdf. For a discussion of the Global Partnership, see James Martin Center for Nonproliferation Studies, "Global Partnership Against the Spread of Weapons and Materials of Mass Destruction ('10 Plus 10 Over 10' Program')," Nuclear Threat Initiative, updated May1, 2018, http://www.nti.org/treaties-and-regimes/global-partnership-against-spread-weapons-and-materials-mass-destruction-10-plus-10-over-10-program/; For a discussion of GTRI, see, for example, Anya Loukianova and Cristina Hansell, "Leveraging U.S. Policy for a Global Commitment to HEU Elimination," *Nonproliferation Review,* Vol. 15, No. 2 (July 2008), pp. 159-183. (GTRI also included work to upgrade security for radiological materials and remove them where they were no longer needed, in the United States and globally.) For UNSCR 1540, see Daniel Salisbury, Ian J. Stewart, and Andrea Viski, eds., *Preventing the Proliferation of WMDs: Measuring the Success of UN Security Council Resolution 1540* (Cham, Switzerland: Palgrave MacMillan, 2018).

29 Bunn and Wier, pp. 52-53.

30 Bunn and Wier, *Securing the Bomb,* p. vii.

31 Bunn and Wier, p. x.

2004 presidential campaign, with Democratic candidate Senator John Kerry adopting our recommendation for a four-year effort to secure all weapon-usable nuclear material. At one of Kerry's debates with Bush, one of the only points of agreement between the two men was that nuclear terrorism was the number one threat to US national security.

2005-2008: The Bratislava Initiative Offers Top-Level Direction

This slow pace was, of course, even more visible and frustrating to the people in the government trying to move these programs forward. Satellite photographs were revealing a variety of alarming weaknesses even at nuclear weapon storage facilities—including fallen trees over fences. US officials decided it was time to raise the issue of accelerating nuclear security progress to the highest levels, proposing a summit-level initiative on nuclear security. Russian Defense Minister Sergei Ivanov—at the time, one of Putin's closest colleagues—visited Washington for other purposes in early 2005. Publicly, Ivanov made the absurd claim that "not as little as a gram's worth of weapons-grade uranium or plutonium has been lost," but privately, he received an alarming briefing in national security adviser Condoleezza Rice's office—complete with satellite photographs of the vulnerabilities that were alarming the US government. (NSC staffer William Tobey delivered the brief.) On his return to Moscow, Ivanov consulted with Colonel-General Vladimir Verkhovtsev, then commander of the 12th GUMO—who, to his credit, confirmed that some of the US concerns were valid and action was needed.[32]

This was the origin of the Bush-Putin nuclear security initiative agreed to during the Bratislava summit in 2005.[33] The two presidents publicly endorsed accelerating nuclear security work, set a deadline of the end of 2008 for completing agreed upgrades, designated senior officials of each

[32] William Tobey, "U.S. Action to Prevent Nuclear Proliferation and Terrorism: Securing, Detecting, and Disposing of Dangerous Nuclear Material," unpublished manuscript, 2010. For a report of Ivanov's claim, see Jim Wurst, "Ivanov Rejects Claims of Russian Loose Nukes," Global Security Newswire, January 14, 2005, https://www.nti.org/gsn/article/ivanov-rejects-claims-of-russian-loose-nukes/.

[33] White House, Office of the Press Secretary, "Joint Statement by President Bush and President Putin on Nuclear Security Cooperation," February 24, 2005, https://georgewbush-whitehouse.archives.gov/news/releases/2005/02/text/20050224-8.html.

government to be responsible for making progress, and demanded regular reports. After the summit, lower-level officials agreed on a particular list of nuclear weapon storage facilities and buildings with weapon-usable materials that would receive security upgrades—which the US side intended to be as comprehensive as practicable, though it excluded facilities Russian experts had made clear were too sensitive, such as the serial production facilities. On the US side, NNSA handled the work on security for nuclear material, and NNSA and DOD split the work upgrading security at nuclear weapon storage sites. Work on warhead transport security also continued, with the United States going so far as to pay the costs for Russia to transport many hundreds of warheads to dismantlement sites.

Putin's personal endorsement—and demand for rapid progress—was crucial in overcoming some of the obstacles that had been delaying the MPC&A work, and the work accelerated quickly. The upgrades at the initially agreed locations were largely completed by the end of 2008 as envisioned—but perhaps because the initial work was going well, the Russian government put additional locations on the list (mainly buildings at large sites where other buildings were already on the upgrade list), continuing the cooperation. And although work at some sites had been declared "completed," experts from both sides agreed on additional important improvements to make there—focusing particularly on sustainability and on additional measures to cope with insider threats. As a result, major work was continuing well past the end of 2008.

In 2006, Russia and the United States worked together to launch the Global Initiative to Combat Nuclear Terrorism (GICNT), which has since attracted 89 member states.[34] Effective nuclear security is one of the core GICNT principles, and key Russian nuclear security officials such as Verkhovtsev attended a number of the early meetings. Nevertheless, GICNT never focused substantially on MPC&A issues, leaving those to the bilateral cooperation programs between the United States and other countries. This was a missed opportunity—one that should still be corrected.

The tensions that had been building before did not disappear. Many in both the US and Russian governments were now seeing this cooperation as time

[34] More information on the Global Initiative is at http://www.gicnt.org/index.html.

limited—something that would be "finished" soon and would then no longer be needed. (By contrast, many US and Russian working-level experts thought that continuing joint work on sustainability, security culture, and other issues was likely to be worthwhile for years to come.) As the most urgent upgrades were completed, continuing the work began to seem less urgent to some, giving critics of the cooperation on each side more opportunity to raise objections to next steps. US-Russian political tensions grew substantially after the 2008 war between Georgia and Russia—which included, among other things, Russian tanks crushing some counter-nuclear-smuggling radiation detectors that had been installed at the border with US assistance. Tensions over access continued, critics in Congress intensified their questions about whether this funding was just subsidizing.

Russian nuclear modernization, and US export control measures on equipment being sent to Russia were still burdensome. These festering disagreements would soon prove fatal to the effort.

2009-2014: Increasing Tensions and the Suspension of the Effort

When US President Barack Obama took office in January 2009, he made nuclear security a priority and sought to "reset" US relations with Russia. At a 2009 summit between Obama and Dmitry Medvedev, the new Russian president, the two sides established a working group under the joint leadership of Rosatom Director-General Sergei Kirienko and US Deputy Secretary of Energy Daniel Poneman that actively pushed forward cooperation on both nuclear energy and security.[35] A US-Russian agreement on civil nuclear energy cooperation negotiated in the Bush administration was finally approved and was seen in Russia as a symbol of genuine US willingness to cooperate with Russia's nuclear establishment. Funding for nuclear security programs grew. When Obama called a global summit on nuclear security for April of 2010 in Washington, DC—the largest summit of world leaders since the founding of the United Nations—Russia was an active participant.

[35] What had been the Ministry of Atomic Energy (Minatom) had been restructured, first into the Federal Agency for Atomic Energy and then into the Russian State Atomic Energy Corporation (Rosatom).

Despite these initial positive signs at the political level, on-the-ground MPC&A progress in Russia was slowing, and in key agencies of the Russian government, there was less and less interest in continuing. Work at some key facilities (such as the last buildings at Mayak) slowed to a glacial pace. Liability and access to sensitive sites remained ever-troublesome. In particular, with the major upgrades at many sites completed and only smaller projects—involving much less money—remaining at those locations, Russian officials were much less motivated to grant access to US personnel. From their point of view, access without money amounted to just "nuclear tourism." From the US point of view, without continuing access, there was little way to know if effective security and accounting systems were being sustained, and how security approaches were changing in the face of an evolving threat.
By October 2012, with the extended CTR umbrella agreement slated to expire in 2013, Russia indicated that it did not wish to renew the accord.[36] This provoked a scramble among US officials who wanted cooperation to continue; they sought to find a way to continue work while finessing the liability issue in particular. The solution the two sides settled on was to negotiate a protocol to the existing Multilateral Nuclear Environmental Program in Russia (MNEPR) agreement, which had a more reasonable liability provision and was already in place. Hence, in mid-2013, the CTR agreement expired and was replaced by a MNEPR protocol that focused only on nuclear security work, not the much broader set of activities once covered under the CTR agreement.[37]

Despite negotiating a new agreement specifically designed to allow nuclear security work to continue, however, Russia showed little interest in signing new contracts under the new accord. Recognizing that the MNEPR approach was not working well—and that there were many other potential areas of cooperation not covered by that agreement—DOE and Rosatom negotiated

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[36] Mary Beth D. Nikitin and Amy F. Woolf, "The Evolution of Cooperative Threat Reduction: Issues for Congress," Congressional Research Service, November 23, 2015, https://fas.org/sgp/crs/nuke/R43143.pdf, p. 6. See also Tom Z. Collina, "Nunn-Lugar Program's Future Uncertain," *Arms Control Today,* November 2012, https://www.armscontrol.org/act/2012-11/nunn-lugar-program's-future-uncertain.
[37] U.S. Department of State, "A New Legal Framework for U.S.-Russian Cooperation in Nuclear Nonproliferation and Security," June 19, 2013, https://2009-2017.state.gov/r/pa/prs/ps/2013/06/210913.htm.

an R&D agreement that could potentially cover a broad range of activities (and had a flexible liability provision).[38] But as it turned out, it was too late—this agreement was never put to use before cooperation was cut off. That accord, however, is still available as an umbrella for implementation if cooperation resumes in the future.

During this period, many US officials seemed to assume that Russia would get over its grumpiness and work could continue largely as before. A few experts at NNSA, by contrast, saw the signs that Russia was moving to cut off cooperation and tried to make the case for a new, genuinely partnership-based approach similar to some of the approaches taken in the lab-to-lab effort, which might be of more interest on the Russian side. By the time some of those ideas were floated with Russian officials, however, any opportunity that might have existed had passed.

Indeed, by late 2013, even the PIR Center in Moscow, once one of the strongest supporters of US-Russian nuclear security cooperation, published a report that concluded that "[b]ilateral efforts in the area of bolstering the security of nuclear ammunition and nuclear industry facilities in Russia using American assistance must come to an end; all the objectives in this area have been achieved, and there is no scope for further cooperation."[39]

Then came the Russian annexation of Crimea in 2014. The Obama administration imposed sanctions in response. Unwisely, those sanctions halted the tiny but symbolically important nuclear energy cooperation with Russia that was underway. With the United States having cut off the cooperation Russia favored, it was not surprising that later in the year, Russia suspended the cooperation the United States favored, on nuclear security. The Russian government officially suspended but did not terminate the agreement, and it allowed regulatory cooperation and work with several non-

[38] Agreement Between the Government of the United States of America and the Government of the Russian Federation on Cooperation in Nuclear and Energy-Related Scientific Research and Development, September 2013, http://fissilematerials.org/library/u-s-department-of-energy-agreement-with-rosatom.pdf.

[39] Vladimir Orlov and Alexander Cheban, "General Principles of Future Russian-U.S. Nuclear Cooperation: 20 Points for New Partnership," in *Prospects for International Cooperation in WMD Nonproliferation and Nuclear Security* (Moscow: PIR Center, September 2013).

Rosatom institutes to continue. Russian statements clearly signaled that if the United States was prepared to resume nuclear energy cooperation, Russia was prepared to resume nuclear security discussions.[40] Nevertheless, as of this writing (spring of 2021), US-Russian nuclear security cooperation has been effectively at a standstill for nearly seven years. The world's two largest nuclear complexes are proceeding in near-total isolation from each other—a situation that endangers US, Russian, and global security.

In Parallel: Securing "Plutonium Mountain" in Kazakhstan

As US-Russian nuclear security cooperation within Russia saw its rise and decline, US and Russian laboratory experts and others were also cooperating with Kazakh experts to address vulnerable nuclear material left over at the former Soviet nuclear test site at Semipalatinsk.

Here, too, Hecker played a key role. While still serving as director of Los Alamos, he worried there might be materials there comparable to some that had existed at the US test site. Danny Stillman, a Los Alamos expert, had heard from Kazakh scientists that Hecker's concerns were justified, and wrote a memo proposing an urgent joint effort to remove or secure the materials.

After stepping down as director, Hecker traveled to Kazakhstan to talk to Kazakh experts; with the detail they provided, he became even more alarmed. Certain types of experiments had left substantial quantities of readily accessible nuclear material, some in metal containers and some in tunnels in Degelen Mountain at the test site—which some came to call "Plutonium Mountain." The key locations were far enough from the main buildings at the test site that there was virtually no security in place, and scavengers were digging at the site (including with heavy equipment) to recover scrap metal for sale. Hecker then traveled to Russia and spoke to his Russian laboratory counterparts—whose expertise on what experiments had been done and what material was located where would be crucial to resolving the problem. The sensitivities of the issue were enormous, especially as some of the locations might still have material in forms that would reveal nuclear weapon design

[40] Bunn, "Rebuilding U.S.-Russian Nuclear Security Cooperation"; and Bunn, "Russia Puts Positive Spin on Nuclear Security Cooperation."

information. Nevertheless, because of the personal rapport they already had with Hecker, his Russian colleagues were ultimately willing to discuss the issue—and then able to get permission to work with the Americans and the Kazakhs to address it.

Ultimately the US, Russian, and Kazakh experts managed to work out arrangements to address the various different types of material that existed at the site. The work proceeded in stages—indeed, in the mid-2000s, after several projects to secure material in particular explosive chambers and boreholes, the Russians revealed that some 100 kilograms of plutonium in even more sensitive forms had not yet been addressed. The work did not go quickly: while Stillman's memo was written in 1995, and Hecker's first visit to Kazakhstan and Russia to discuss the issue was in 1998, the work was declared completed only in 2012—after a final push going through the harsh winters after Presidents Obama, Medvedev, and Nursultan Nazarbayev agreed to a 2012 deadline at the 2010 Nuclear Security Summit. At the completion ceremony in 2012—as work in Russia itself was getting increasingly contentious—the experts who had worked together unveiled a stone monument that said, in three languages: "The world has become safer."[41]

Lessons of the US-Russian Nuclear Security Cooperation Experience

The danger of nuclear theft is not a Russian problem; it is a global problem. The essential ingredients of nuclear weapons exist in hundreds of buildings in almost two dozen countries. National efforts and international cooperation have led to dramatic improvements in nuclear security over the three decades since the collapse of the Soviet Union—not only in the states of the former Soviet Union but around the world. Nevertheless, nuclear security requires continuous work and improvement, to find and fix once unnoticed

[41] The most detailed discussions of this project, from participants, can be found in Hecker, *Doomed to Cooperate,* Vol. 1., pp. 443-513. See also Eben Harrell and David E. Hoffman, "Plutonium Mountain: Inside the 17-Year Mission to Secure a Dangerous Legacy of Soviet Nuclear Testing" (Cambridge, MA: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, August 2013), https://www.belfercenter.org/sites/default/files/files/publication/Plutonium%20Mountain-Web.pdf.

weaknesses and to cope with evolving threats. Hence, the lessons of US-Russian nuclear security cooperation remain relevant—to the potential for future renewed US-Russian cooperation in that area, to US-Russian cooperation in other areas, and to nuclear security cooperation with other countries.[42] Several key lessons are considered below.

Partnership works. As the lab-to-lab effort makes clear, cooperation on nuclear security is most effective when it incorporates ideas and resources from both sides, is based on genuine mutual respect and personal relationships among experts, and is seen as serving both countries' national interests. Countries such as China, India, and Pakistan are far more likely to join an effort framed as a partnership of the leading nuclear states to ensure nuclear security worldwide than one described as assistance to countries too weak and uninformed to take care of nuclear security themselves. Building trust among the participants in such a partnership is crucial to gaining the flexibility needed to overcome the inevitable obstacles. Even when security improvements seem urgent, it is sometimes necessary to start with small steps—like the initial lab-to-lab MPC&A demonstrations—to build trust before expanding to more substantial efforts. It is also essential to follow through on what has been agreed upon, rather than ripping up previous agreements (as the US government did when the lab-to-lab effort was consolidated with other MPC&A work).

Cooperation has to be seen as serving both sides' national interests. The US-Russian cooperation worked well when people on both sides genuinely believed the work they were doing was important to their own country's

[42] Several important studies have offered lessons from the cooperative threat reduction experience overall, or particular aspects of it. See, for example, Hecker, *Doomed to Cooperate;* US National Academy of Sciences, *Global Security Engagement: A New Model for Cooperative Threat Reduction* (Washington, DC: National Academies Press, 2009); US National Academies of Sciences, Engineering, and Medicine, *Cooperative Threat Reduction Programs for the Next 10 Years and Beyond: Proceedings of a Symposium in Brief* (Washington, DC: National Academies Press, 2018); and John M. Shields and William C. Potter, eds., *Dismantling the Cold War: U.S. and NIS Perspectives on the Nunn-Lugar Cooperative Threat Reduction Program* (Cambridge, MA: MIT Press, 1997). For a Russian perspective, see the PIR Center report, *Prospects for International Cooperation in WMD Nonproliferation and Nuclear Security.* This section expands on the lessons offered in Bunn, "Cooperation to Secure Nuclear Stockpiles."

security and to the world. It worked badly when the United States tried to tell Russia the work had to be done on US terms because the United States was paying the bill.

Personal relationships and frequent communication are fundamental. The relationships of mutual respect and trust that the experts on both sides were able to build were crucial in overcoming the many obstacles that arose in this cooperation. As just one example, had Russian laboratory leaders not already known and trusted Hecker when he came to them wanting to talk about the extremely sensitive issue of the nuclear material at Semipalatinsk, they would have been highly unlikely to have been willing to take the personal risk of working their system to get approval to cooperate. Building those relationships, overcoming the obstacles that inevitably arise, and seizing new opportunities that come along requires frequent communication—including as much in-person communication as possible. In talking to participants in this cooperation and reading their accounts, it is remarkable how often it is the personal anecdote outside the formal meeting that comes up. The benefits of investing in these personal relationships are hard to measure but very real.

Top-down and bottom-up approaches may work, but approaches through the middle are less successful. Initiatives from the presidential level can sweep aside seemingly intractable bureaucratic and political obstacles to progress when powerful and motivated actors are assigned to follow through—as occurred at the Bratislava summit. As the lab-to-lab experience shows, bottom-up initiatives starting with technical experts at individual sites can also be remarkably powerful, though only if they have at least some support from high-level officials (such as Undersecretary Curtis and Minister of Atomic Energy Victor Mikhailov in the case of the early days of lab-to-lab cooperation). The bottom-up approach, however, is more likely to work in countries undergoing revolutionary transformation, as Russia was in 1992, or in more stable countries where the necessary work is modest in scale and not especially sensitive (such as upgrading security or converting the fuel at a civilian HEU-fueled research reactor, the only nuclear facility of concern in many countries).
Mid-level nuclear officials, by contrast, usually have little flexibility to introduce major changes in approaches to nuclear security, and usually resist foreign attempts to convince them to do so. From the point of view

of a mid-level security official at Minatom, agreeing with the Americans on something later seen as compromising secrets would be a major career risk, while slow progress could always be blamed on US intransigence; similarly, from the point of view of a mid-level official in the US government, agreeing to a compromise on liability or site access could be a risk, while slow progress could be blamed on lack of cooperation on the Russian side.

Building commitment and a sense of urgency are crucial. If senior officials and facility managers are to assign sufficient resources to nuclear security and do the political work to change approaches, they must be convinced that the threat of nuclear theft and terrorism is real and urgent and that the proposed nuclear security steps are needed to reduce the risk.

Nuclear security policy entrepreneurs are more likely to make headway when events create a sense of urgency and allow them to break through the complacency that so often slows nuclear security progress. This event-driven sense of urgency occurred with the nuclear material seizures in 1993-1994, the 2001 terrorist attacks in the United States, and the satellite photographs showing serious security weaknesses shown to Ivanov in 2005.

But policy makers can also take actions that help overcome complacency, including detailed reports and briefings on the nuclear terrorist threats; exercises and simulations of nuclear terrorism scenarios, which engage hearts and minds in a way that paper reports and briefings never do; and realistic tests of security systems' performance in the face of intelligent adversaries trying to find ways to defeat them.[43]

Focused efforts to "sell" cooperative programs to policy makers are key. If policy makers know little about what is being done in a cooperative program and why, they are more likely to make decisions based on partial or incorrect information. In Russia, for example, some lawmakers genuinely believed the US purchase of excess HEU, blended down to LEU for reactor fuel, or

[43] For more detailed suggestions for combating complacency, see Matthew Bunn, Nickolas Roth, and William H. Tobey, *Revitalizing Nuclear Security in an Era of Uncertainty* (Cambridge, MA: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2019), pp. 158-165.

the Mayak Fissile Material Storage Facility were US efforts to disarm and dominate Russia; in the United States, some lawmakers genuinely believed Russia was just taking threat reduction money and using it to modernize its nuclear stockpile. A focused, consistent effort to keep decision makers and the broader public informed of the reasons for cooperation, the successes being achieved, and the benefits to the country of the cooperation is key.

Understanding the root causes of problems strengthens cooperation to solve them. Just as a doctor needs an accurate diagnosis to be able to offer an effective prescription, in working to improve nuclear security, it is important to have a good understanding of what caused weak nuclear security in the first place. The first US conception was that the problem was a knowledge gap: because the Soviet Union, as a closed society, had been able to rely on monitoring people, Russian experts would not be familiar with modern technologies for monitoring and accounting for material. The idea of demonstrating modern technologies was designed to fill this knowledge gap. But it quickly became clear that there was also a money gap—Russian facilities simply did not have the funds to install modern MPC&A systems. This was the origin of going from demonstrations to paying for widespread installation of MPC&A systems. Originally, the idea was that this was a short-term money gap. The expectation was that Russia's economy and the budgets for nuclear facilities would quickly stabilize, and, therefore, once the systems were installed, the facilities would be able to pay for operating, maintaining, replacing, and upgrading them over time. The 1998-1999 ruble crisis called this into question, generating a new focus on sustainability. A fundamental issue that was never fully addressed is whether the weaknesses in MPC&A, as seen from a US perspective, arose and persisted because Russian nuclear organizations did not believe the threats were serious enough to justify stronger security measures than they had—that is, whether the issue was as much a lack of *commitment* as it was a lack of *capacity*.

Strong security cultures are a fundamental part of effective nuclear security. Nuclear security relies fundamentally on people and their vigilance; a nuclear security system with excellent equipment can fail if people prop doors open for convenience, guards turn off alarm systems to avoid being

bothered by false alarms, or no one bothers to fix equipment when it is out of order (all events that have occurred at both US and Russian nuclear facilities). An organizational culture in which everyone understands that the threat is real and that security is their job, not just the job of the security force, is key to a well-functioning security system. Building such a culture, in the face of constant pressures to meet deadlines, expand production, or do whatever else it is that the operation is tasked to do, is an enormous challenge. Coping with the potential insider threat is particularly difficult, as insiders' trusted, authorized status tends to lead people to let their guard down. A focus on security culture should be built into nuclear security cooperation programs.

Involving the users is essential. Only when the people who will use and maintain an improved nuclear security system are directly involved in conceiving, designing, and implementing the new approach are they likely to have the sense of ownership that will lead them to use and maintain it effectively after foreign assistance comes to an end. This lesson is not unique to nuclear security cooperation: a major World Bank study, for example, pointed out that 62 percent of rural water projects that promoted extensive participation by the recipients were successful, compared to only 10 percent that did not.[44]

Flexible approaches are needed—especially on issues such as secrecy and access. To be successful, security upgrade programs in many cases will have to find creative, flexible ways around obstacles that arise. Long-established policies on various issues, from how training requirements are set to how nuclear-related equipment is approved, will often create obstacles that require creativity to overcome. Secrecy, in particular, is almost always an issue (and particularly in a traditionally secrecy-obsessed country such as Russia). Countries are simply not going to reveal all of their nuclear security secrets. But there is a great deal that can be done to improve security for nuclear sites without actually seeing them or learning anything very specific about them—from detailed discussions of techniques and best practices for assessing vulnerabilities to outsider and insider threats, to identifying some of the best

[44] World Bank, *Assessing Aid: What Works, What Doesn't, and Why* (Oxford: Oxford University Press, 1998).

commercially available equipment, to training and other help with writing and enforcing effective nuclear security rules. Using methods developed in the lab-to-lab program, the United States or other donor countries can finance security upgrades at sites their experts will never visit while ensuring that their money is being spent appropriately.

Policy entrepreneurs and local champions are crucial. In general, the experience of US-Russian nuclear security cooperation emphasizes the importance of having committed people generating new ideas on both sides. In particular, to make progress on nuclear security with a particular facility or agency, it is crucial to identify and work with local champions—nuclear security advocates motivated to work through their government's decision-making process to get approval for the next steps. As Margaret Mead is said to have remarked, "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has."[45]

Looking to the Future: Can US-Russian Nuclear Security Cooperation Be Revived?

Russian nuclear security today is dramatically different than it was in the early 1990s. The most egregious weaknesses have been fixed, a functioning regulatory system is in place, and nuclear facilities get regular funding, sufficient to maintain their nuclear security systems. Indeed, publicly available procurement data and commercial satellite photographs both demonstrate that at least at some sites, Russia has made substantial investments of its own in beefing up nuclear security after US-Russian cooperation was suspended.[46]

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[45] This statement does not appear to exist in Mead's published works. As far as is known, it was first attributed to Mead by Donald Keys in 1982. "Never Doubt That a Small Group of Committed, Thoughtful Citizens Can Change the World; Indeed, It's the Only Thing That Ever Has," *Quote Investigator,* November 12, 2017, https://quoteinvestigator.com/2017/11/12/change-world/.

[46] For a summary, see Matthew Bunn and Dmitri Kovchegin, "Nuclear Security in Russia: Can Progress be Sustained?" *Nonproliferation Review,* Vol. 24, No. 5-6 (Spring 2018), pp. 527-551.

Nevertheless, there are reasons for concern. Russia still has the world's largest stocks of nuclear weapons, plutonium, and HEU, in the world's largest number of buildings and bunkers. Some key regulations are still weaker than they should be, particularly concerning protecting against insider threats. For example, Russia's "two-person rule" requires people to enter a nuclear material area together, but not to stay together once there. Corruption remains a troubling problem—including in the nuclear industry—further heightening the concern over insider threats. Complacency about the threat is widespread, undermining security culture.

To be fair, there are good reasons for concern in virtually every country where nuclear weapons or the materials needed to make them exist—including the United States. (After the 2012 intrusion by an 82-year-old nun and two other protesters at the Y-12 nuclear security site, Russia sent a diplomatic note to the United States on its poor nuclear security, offering to send experts to advise.)

More fundamentally, many aspects of nuclear security pose difficult ongoing challenges, and Russian and US experts, custodians of the world's largest nuclear stockpiles, have much to learn from each other about how to deal with them: How to motivate staff to always be vigilant for events that almost never occur? How to protect against threats from trusted, authorized insiders without undermining the trust and cooperation necessary for an organization to be successful? How to adapt security to ever-evolving threats—including drones, cyberattacks, and more—without bankrupting facilities with ever-changing requirements? The learning that would result from discussions of these questions would serve the national interests of both countries.

Today, the old US-funded approach to cooperation is neither appropriate nor necessary. Instead, renewed cooperation should be based on equality, with both sides paying their own way. Cooperation might include, for example, joint technical working groups in particular areas, from tamper-indicating devices to strengthening security culture; joint R&D on improved security and accounting technologies (which would inevitably involve discussions of each side's nuclear security concepts of operations and how these technologies

would fit into them); working together to provide nuclear security training for facility staff in the United States and Russia, and in other countries; and cooperation to improve nuclear security in third countries.[47]

Russian officials have made clear to both US officials and US nongovernmental experts that they are prepared to return to nuclear security cooperation—which was only suspended, not terminated—if, and only if, the United States is prepared to return to cooperation on nuclear energy, which Russian officials see as an indicator of whether or not the United States is serious about a cooperative approach. I believe that despite the fierce commercial competition between Russia and the United States in nuclear energy, cooperation in certain areas of long-term nuclear energy R&D would serve US interests in exploring improved nuclear options for mitigating climate change. It is time to acknowledge that including nuclear energy cooperation in the post-Crimea sanctions was a mistake that should be reversed.

The Nuclear Threat Initiative and the Center for Energy and Security Studies in Moscow have convened US and Russian experts to lay out ideas for joint work in nuclear energy, nuclear safety, nuclear science, nuclear cleanup—and nuclear security. Various promising opportunities are available if political leaders are ready to seize them.[48]

Today, US-Russian political relations are as poisonous as they have been in decades. Former Secretary of Energy Ernest Moniz and former Senator Nunn

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47 For a more detailed set of proposals, see Matthew Bunn, "Steps for Rebuilding U.S.-Russian Nuclear Security Cooperation," in *Proceedings of the 58th Annual Meeting of the Institute for Nuclear Materials Management, July 16-20, 2017* (Mount Laurel, NJ: INMM, 2017). For more on the idea of joint R&D—and possible sharing of proceeds from selling the resulting nuclear security and accounting technologies—see Simon Saradzhyan and William Tobey, "U.S.-Russian Space Cooperation: A Model for Nuclear Security," *Bulletin of the Atomic Scientists,* March 7, 2017, https://thebulletin.org/2017/03/us-russian-space-cooperation-a-model-for-nuclear-security/.

48 See *Pathways to Cooperation: A Menu of Potential U.S.-Russian Projects in the Nuclear Sphere* (Washington, DC: Nuclear Threat Initiative and Center for Energy and Security Studies, February 2017), http://www.nti.org/media/documents/Pathways_to_Cooperation_FINAL.pdf.

have warned that "not since the Cuban Missile Crisis of 1962 has the risk of a US-Russian confrontation involving the use of nuclear weapons been as high as it is today."[49] In Washington, there is more talk of new sanctions than of paths to cooperation. Nevertheless, there are some hints in both capitals that despite the larger political confrontation, both sides would like to find areas of common interest where cooperation might be possible. The next time the US and Russian presidents meet and issue a joint statement, they should include direction for their nuclear experts to begin working together again—on an agenda that includes nuclear energy, nuclear security, nonproliferation, technologies for verifying future arms agreements, and more.

[49] Ernest J. Moniz and Sam Nunn, "The Return of Doomsday: The New Nuclear Arms Race—And How Washington and Moscow Can Stop It," *Foreign Affairs,* September/October 2019.

CHAPTER TWO

UN Security Council Resolution 1929 on Iran: US-Russian Cooperation and the Quest for Diffuse Reciprocity

Hanna Notte

This chapter looks at Russian cooperation with the United States in passing United Nations Security Council Resolution 1929 on Iran's nuclear program in June 2010 and in banning delivery of the S-300 missile defense system to Tehran in September of that year.[1] Such cooperation on the Iran nuclear dossier occurred at a time when the United States and Russia were eager to improve their relations, which had gradually deteriorated over US President George W. Bush's second term. Amid warming ties, and mindful that containing a nuclear Iran topped the Obama administration's foreign policy agenda, Russia hoped its cooperation would elicit US reciprocity in bilateral areas, especially arms control, civilian nuclear energy cooperation, and US support for Russia's bid for accession to the World Trade Organization (WTO). Responding to a severe recession in 2008 by reorienting its priorities toward economic modernization, Russia also hoped the "reset" in US-Russian relations would contribute to its domestic agenda.

Having resisted the imposition of new international sanctions against Iran throughout 2009, the Russian government's position shifted toward support for US pressure on Iran, which the Obama administration viewed as part of its "dual-track" approach on the nuclear dossier. That approach envisioned both diplomatic engagement and pressure on Iran and was driven by an overall recognition in the White House that previous US policy on Iran had

[1] This chapter is adapted, in abbreviated form, from the author's doctoral thesis: Hanna Notte, "Russian–American Cooperation in the Middle East: An Analysis of Moscow's Interests, Leverage, and Strategies of Linkage," PhD diss., University of Oxford, 2017.

failed to settle the nuclear dispute. It entailed initially engaging the Iranians in negotiations on the nuclear dossier, and then pivoting toward sanctions in case diplomatic talks proved fruitless.

The Russian shift toward support for sanctions was driven by concerns that diplomatic tensions over Iran's nuclear program could precipitate armed escalation in the region, and to a lesser extent by apprehensions regarding the prospect of Iran militarizing its nuclear program. Russian diplomats also grew frustrated with the Ahmadinejad regime's diplomatic intransigence in defying US diplomatic overtures. Tehran's failure to disclose the construction of a secret uranium enrichment facility near Qom and its decision to reject the US-Russian proposal on the Tehran Research Reactor (TRR)—which entailed a significant role for Moscow in readying fuel rods for a reactor in Tehran producing medical isotopes—had a particular impact on Russian officials.

While Moscow decided to cooperate with Washington in disciplining Tehran, the Kremlin was careful to shield Iran from excessive pressure in negotiating Resolution 1929, eager to protect its own commercial interests and sensitive political relationship with Iran. Russian diplomats negotiated qualified language and carve-outs in the resolution, especially related to Iran's military, energy, and financial sectors. However, the Kremlin did not try to abort the multilateral sanctions effort altogether, determined to preserve the UN Security Council as the chief venue for negotiations on Iran.

The purpose of this chapter is to determine the extent to which Russia's cooperation on the Iran nuclear dossier in 2009 and 2010 was driven by its narrow security, economic, and other interests in the Middle East region, versus expectations of linkage to issues in the Russian-US bilateral agenda. In doing so, it fills a gap in the scholarship on Russian foreign policy, especially in the areas of arms control and nonproliferation, by providing an empirical account of whether and how linkage diplomacy on such issues plays out in diplomatic practice, and to what extent it matters in explaining arms control cooperation.

Recent years have seen a flurry of pundit analysis suggesting that Russia is amenable to deal making, trades, or linkage in conducting its Middle East policy. However, few accounts have provided granular insight into the

underlying drivers of Russia's approach to arms control issues in the Middle East, weighing the relative explanatory value of Russia's commercial versus security and nonproliferation interests in that region, let alone subjecting the notion of linkage to rigorous empirical verification. An exercise in the latter is of relevance to policy makers today for several reasons: the enduring nonproliferation challenges in the Middle East, including but not limited to the Iran nuclear dispute; Russia's growing influence in the Middle East in recent years, including in its alliance relationship with Iran; and enduring tensions in the broader Russian-US bilateral relationship, which mandate particular attention in Washington to the question of which negotiation strategies vis-à-vis Moscow do and do not work.

Against the backdrop of improving relations between Russia and the United States, Moscow's cooperation on the Iran nuclear dossier evolved through four distinct phases:

During the first phase, lasting from President Barack Obama's inauguration in January to late September 2009, Russia warmed to the US dual-track approach on Iran, which initially prioritized diplomatic engagement over pressure. In the summer, following Obama's first trip to Moscow, Russian and US officials began working on the TRR proposal although the Kremlin remained opposed to sanctions. Following Iran's revelation of its secret Fordow enrichment facility in September 2009, heralding the second phase of cooperation (September–December 2009), Russian officials grew increasingly frustrated with the Iranian government. Iran's deception over Fordow was compounded in November by Tehran's failure to embrace the TRR proposal.

Once the Obama administration moved onto its pressure track in early 2010, setting in motion the third phase, the Kremlin agreed to discuss multilateral sanctions against Iran. In doing so, however, the Russian government pushed for restrictions narrowly targeting the country's proliferation activities. By early April, which also saw the signing of the New Strategic Arms Reduction Treaty (New START), talks among the UN Security Council's five permanent members plus Germany (P5+1) on a draft resolution had moved to the UN Security Council. A last-ditch diplomatic effort in May by Turkey and Brazil did not delay passage of Resolution 1929 in June 2010.

The fourth phase saw a debate in Russia regarding the implications of Resolution 1929 for its prospective S-300 delivery to Tehran, which was resolved in September by a presidential decree banning the sale.

Rather than proceeding chronologically, this chapter will critically address different Russian interests in cooperation, assessing their relative explanatory value, and refer to the four phases outlined as relevant.

The chapter argues that Russian diplomacy on the Iran nuclear issue, first and foremost, sought to elicit Tehran's compliance with existing UN resolutions and full cooperation with the International Atomic Energy Agency (IAEA). While Russian officials remained less concerned than the United States about the military dimension of Iran's nuclear program, Moscow feared that the US or Israeli government might take unilateral measures, including the use of force, to resolve the dispute. Mindful that containing a nuclear Iran topped the Obama administration's foreign policy agenda, Russia also hoped its cooperation would elicit US "diffuse reciprocity" on other bilateral issues, especially missile defense, an agreement on peaceful nuclear cooperation, and Russia's bid for accession to the WTO. While the Russian government expected cooperation on Iran to make an atmospheric contribution to a more constructive relationship overall, there is less evidence that Russian officials pursued explicit linkage diplomacy or sought direct quid pro quos.

The Key Drivers of Russian Cooperation

Strengthening the Nuclear Nonproliferation Regime in the Middle East

In the period under investigation in this chapter, Russian policy on the Iran nuclear issue remained guided by concerns about nuclear proliferation in the Middle East. While Russia had been turning a blind eye to clandestine Iranian behavior in the nuclear field during the 1990s, evidence of Iran's violations of its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons in 2002 strengthened the Kremlin's resolve to support international efforts to seek a diplomatic solution.[2] The Russian government consistently argued that Iran had the right to use nuclear energy but that the

[2] Stephen Blank, "Beyond the Reset Policy: Current Dilemmas of U.S.–Russia Relations," *Comparative Strategy,* Vol. 29, No. 4 (2010), pp. 333-367.

international community needed to ensure the program's peaceful nature, which could be achieved only under IAEA oversight.[3]

While Moscow was concerned about nuclear nonproliferation globally, it was especially worried about the Middle East. In 2006, Russian political scientist Sergey Karaganov predicted, "If Iran goes nuclear, Saudi Arabia and Egypt are likely to build the 'Arab nuclear bomb.'"[4] Speaking with Obama in July 2009, Russian President Dmitry Medvedev warned that "there are regions around the world where the presence of nuclear arms would create huge problems, and these are areas where we should concentrate our efforts together with our American partners."[5] Medvedev then named North Korea and the Middle East. Russia's concern with arms control and nonproliferation in the Middle East has been institutionally reflected in that, within the Foreign Ministry, the Department for Nonproliferation and Arms Control (*Departament Po Voprosam Nerasprostraneniya i Kontroliya Nad Vooruzheniyami,* or DNKV) has traditionally enjoyed a higher standing than regional departments. When it comes to policy on Iran, the DNKV's priorities typically prevail over the Second Asia Department, which deals with Iran relations aside from the nuclear issue.[6]

The concern with nuclear nonproliferation notwithstanding, the Russian leadership had historically been less anxious about Iran than the United States had been[7] and continued to state that it had no evidence that Tehran's

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[3] "Interv'yu ital'yanskomu telekanalu «RAI» i gazete «Korr'ere della Sera»" [(Russian President Dmitry Medvedev) Interview with the Italian TV Station RAI and the Newspaper *Corriere della Serra*], July 5, 2009, http://kremlin.ru/events/president/news/4719 (hereafter cited as "Medvedev interview with Italian media").

[4] Sergey Karaganov, "Iran: Last Chance But One," *Sputnik,* February 7, 2006. This article and the others from Sputnik cited in this chapter apparently are no longer available on the publication's website.

[5] White House, Office of the Press Secretary, "Press Conference by President Obama and President Medvedev of Russia," July 6, 2009, https://obamawhitehouse.archives.gov/the-press-office/press-conference-president-obama-and-president-medvedev-russia.

[6] Russian nonproliferation expert, interview with author, Moscow, October 5, 2016.

[7] See, for instance, the Russian Foreign Intelligence Service assessment in 1993: "Novyi vyzov posle 'kholodnoi voiny': rasprostranenie oruzhiya massovogo unichtozheniya" [A New Challenge after the Cold War: The Proliferation of Weapons of Mass Destruction], 1993, http://svr.gov.ru/material/2-13-9.htm.

program was of a belligerent nature.[8] Russia did not so much doubt the Iranian intention to develop a capability in nuclear technology, but rather believed the Iranians did not have the expertise to weaponize their program.[9] Russian analysts published conflicting views, with arms control expert Vladimir Dvorkin warning in 2009 that the Russian General Staff underestimated Iran's nuclear weapon potential,[10] while Middle East expert Alexey Malashenko argued that "engineers are sure that the Iranians by themselves will not make a bomb." [11] Throughout late 2009 and early 2010, Russian officials publicly emphasized that there was no evidence that Iran was militarizing its program, thereby also justifying Russia's continued work on the Bushehr nuclear reactor.[12]

Against this background, the Russian government increasingly perceived Iran to be intransigent vis-a-vis an Obama administration, which in 2009 constructively engaged Tehran in diplomacy. This perception shifted Russian calculations regarding the necessity for greater pressure on Iran. But even when Moscow eventually supported UN sanctions, it was adamant that any restrictions be narrowly linked to Iran's nuclear program.

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[8] "Interv'yu S. A. Ryabkova po razoruzhencheskoi problematike" [S. A. Ryabkov's Interview on the Disarmament Issue], April 22, 2009, http://www.mid.ru/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/297402 (hereafter cited as "Ryabkov interview on disarmament").

[9] As one Russian nonproliferation expert said in an interview, Iran's ability to militarize its nuclear program has been exaggerated by other actors in the international community, who conflate an ability to develop bomb fuel (such as highly enriched uranium) with an ability to weaponize the fuel (build a bomb of a deliverable size). Siegfried Hecker, the former director of Los Alamos National Laboratory, said he "never found the basic Russian view to change, which was that they did not consider the Iranian nuclear weapon threat as being very serious, and in addition stood to gain from allowing Iran's civilian nuclear activities." Siegfried S. Hecker, email correspondence with author, June 23, 2017.

[10] "Iran's Missile Programme Potential Greater than North Korea's – Expert," *Sputnik,* September 21, 2009.

[11] "Malashenko: 'Udar SShA po Iranu neveroyaten'" [Malashenko: A US Strike Against Iran Is Unlikely], *Gazeta,* March 30, 2006, https://gzt.ru/society/2006/03/30/211000.html.

[12] "Interv'yu S. A. Ryabkova po problematike iranskoi yadernoi programmy" [S. A. Ryabkov's Interview (with Russian TV program *Vremya Novosti*) regarding the Iranian Nuclear Program], October 26, 2009, http://www.mid.ru/web/guest/adernoe-nerasprostranenie/-/asset_publisher/JrcRGi5UdnBO/content/id/276114.

Russia's Principled Stance against Sanctions

The Russian government disagreed with other P5+1 members on the rationale for punishing Iran. Its position consisted in supporting UN resolutions against Iran while criticizing the use of sanctions as a tool of statecraft in principle. Before 2005, Russia partnered with the European Union to elicit Iranian acceptance of the IAEA Additional Protocol, which would allow the agency to make unannounced visits to Iranian nuclear installations. In February 2005, Russia signed an agreement according to which it would supply low-enriched uranium (LEU) fuel for the Bushehr reactor (and repatriate any spent fuel from it) to preclude its diversion for non-peaceful purposes.

When Iran, following the election of Mahmoud Ahmadinejad to the presidency rejected its agreement with the so-called E3 (France, Germany and the United Kingdom) the IAEA Board of Governors moved the Iran file to the UN Security Council in March 2006. Russia supported this action, yet continued to hope that its offers of enriching uranium to commercial grade for Tehran would solve the dispute. Consequently, Moscow softened, though never vetoed, Security Council resolutions against Iran. For instance, Moscow supported Resolution 1696 in the summer of 2006, which required Iran to "suspend all enrichment-related and [spent fuel] reprocessing activities, including research and development" (R&D) by August 31. Subsequently, Resolutions 1737, 1747, and 1803—which blocked trade in sensitive nuclear material, froze financial assets of persons and entities involved in proliferation-sensitive nuclear activities, banned Iran's arms exports, and encouraged scrutiny of the dealings of Iranian banks—also were endorsed by Russia, though its diplomats sought to ease pressure on Iran.

At the same time, the Russian government cautioned against the use of punitive measures as a tool of diplomacy. It argued that sanctions never lead to positive results if they are intended to harm the target country but instead need to comprise serious political incentives in order to encourage the country to engage in a dialogue. Furthermore, Russia maintained that sanctions can be legitimate only if adopted by the UN Security Council. Throughout 2009 and 2010, even once Russia had in principle agreed to work in the P5+1 toward a new resolution on Iran, Russian officials stuck to

their ambivalent rhetoric that "sanctions are not very productive"[13] and "as a rule result in nothing" although they are "sometimes necessary."[14]

Within Russia's elite and expert community, a widespread skepticism about sanctioning Iran was underpinned by different arguments. The Statists—a constituency including military industrialists, the army, the security services, and, more broadly, those elites least likely to benefit from rapprochement with the West—prioritized Russia's power, independence, and sovereignty in a pluralist international order and coalesced around a principled rejection of sanctions.[15] Their critique of sanctions, especially of the unilateral variety, was an extension of their opposition to any perceived outside interference in internal affairs of sovereign states, which they worried might set a precedent that could be used against Russia itself. Russia's Eurasianist elites, in contrast, opposed sanctions against Iran because they viewed both Russia and Iran as part of the same geopolitical and geoeconomic space.[16] Eurasianism has represented a distinct strand in the Russian foreign policy tradition, which views Russian values as inherently different from those of the West. While Eurasianists have constituted a relatively weak lobby, especially during the reset, their argument that a proud Iran will not bow to outside pressure, just as the Soviet Union did not bow under sanctions, still resonated even among the more pro-Western elites.[17] Finally, the debate between different elites as to the suitability of sanctioning Iran was also complicated by experts' differing assessments of Iran's progress toward weaponizing its nuclear program.

The Russian leadership believed Iran should not acquire a nuclear weapon, recognizing that it would further destabilize the Middle East, but also rejected

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13 Medvedev interview with Italian media.

14 Russian President Dmitry Medvedev, "Interview with CNN," September 20, 2009, http://en.kremlin.ru/events/president/news/5516 (hereafter cited as "Medvedev CNN interview").

15 The discussion in this chapter draws on major Russian foreign policy traditions—"Westernist," "Statist," and "Civilizationist"/"Eurasianist"—as characterized in Andrey Tsygankov, *Russia's Foreign Policy: Change and Continuity in National Identity,* 4th ed. (London: Rowman & Littlefield, 2016).

16 Tsygankov, *Russia's Foreign Policy,* Dmitry Shlapentokh, "Putin's Moscow Approach to Iran: Between Pragmatism and Fear," *Journal of Balkan & Near Eastern Studies,* Vol. 13, No. 2 (June 2011), pp. 189-213.

17 Shlapentokh, "Putin's Moscow Approach to Iran."

the use of economic sanctions as a legitimate and effective tool of diplomacy. The task in this chapter therefore is to explain which developments in 2009 and 2010 led the Russian leadership to come down on the side of supporting sanctions. If it is the case that, as French scholar Clément Therme argues, "in Russia, the balance between … reinforcing … cooperation [with Iran] and … supporting the UN's objective of reducing the risk of nuclear proliferation, generally tilts towards the first,"[18] Russian support for Resolution 1929 represents an anomaly that requires explanation.

Russia's Shift: Fordow, the TRR, and Other Irritants

Throughout the autumn of 2009 and spring of 2010, Iran's actions and rhetoric played a significant role in shaping Russia's crystallizing position in support of UN sanctions.

In late September 2009, Iran revealed that it had been constructing a second uranium enrichment facility, Fordow, near the holy city of Qom. Medvedev commented at the G20 summit in Pittsburgh that these Iranian actions ran "counter to the UN Security Council's repeated demands that Iran freeze its enrichment activities."[19] According to the White House, the US intelligence community had been aware of Fordow's construction for years and had been collecting information in order to build up "irrefutable evidence that the intent of this facility was as an enrichment plant."[20]

However, the United States did not share its intelligence with Russia until just before the Pittsburgh summit, during a bilateral meeting between Medvedev and Obama on the sidelines of the UN General Assembly in New York. US officials had learned of a recent Iranian letter to the IAEA, which disclosed the construction of a "pilot-scale enrichment plant." This letter was the tip-off that the enrichment facility would be made public by Tehran,

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18 Clément Therme, "Iran and Russia: A Tactical Entente" in Stephanie Cronin, ed., *Iranian-Russian Encounters: Empires and Revolutions Since 1800* (Abingdon, UK: Routledge, 2013), p. 394.
19 "Zayavlenie Prezidenta Rossii Dmitriia Medvedeva" [(The Kremlin) Announcement by Russian President Dmitry Medvedev], September 25, 2009, http://kremlin.ru/events/president/news/5575.
20 White House, Office of the Press Secretary, "Background Briefing by Senior Administration Officials," September 25, 2009, https://obamawhitehouse.archives.gov/the-press-office/background-briefing-senior-administration-officials-iranian-nuclear-facility.

which would allow the Ahmadinejad regime to control the narrative and argue its design was for peaceful purposes. Consequently, the United States "needed to beat the Iranians to the punch."[21]

Information on Fordow came as a complete surprise to Russian officials and caused great consternation. In what seemed like an attempt to downplay Russian embarrassment about having been left in the dark, Medvedev stated that it was "unexpected by all countries."[22] However, Foreign Minister Sergey Lavrov charged that "some of our Western partners knew about this" lamenting that "it is not quite clear why the Iranians … did not tell us that they have another project under this program."[23] US officials recalled their Russian interlocutors being "shocked" and "angry" when they learned about Fordow. One US source said that the information—"really sensitive information we do not often share with the Russians—took the wind out of them." According to that source, one senior Russian official commented at the time, "Eto plokho." ("This is bad.").[24]

Following the Fordow revelation, Russian calculations regarding the need for increased economic pressure on Iran shifted because it became harder for Moscow to defend Tehran's behavior. While this evolution in the Russian position took months to fully play out, there were early signs that the United States might succeed in eliciting Moscow's support for tougher sanctions. Michael McFaul, a senior adviser in the Obama administration, argued that once the Russian government had learned of Fordow, the United States

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21 Robert Einhorn, former US Department of State special adviser for nonproliferation and arms control, telephone interview with author, July 8, 2016 (hereafter cited as "Einhorn interview"). The titles used in citations of interviews with former officials in this chapter are the titles the interviewees held during the period under discussion.

22 "Press-konferentsiya po itogam sammita «Gruppy dvadtsati»" [(The Kremlin) Press Conference (with Russian President Dmitry Medvedev) on the Results of the G20 Summit], September 26, 2009, http://kremlin.ru/events/president/transcripts/5578.

23 Ministry of Foreign Affairs of the Russian Federation, "Interview of Russian Minister of Foreign Affairs Sergey Lavrov, Granted to RIA Novosti News Agency, Russia Today TV Channel and Voice of Russia Radio Station," October 20, 2009, http://www.mid.ru/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/277018?p_p_id=101_INSTANCE_cKNonkJE02Bw&_101_INSTANCE_cKNonkJE02Bw_languageId=en_GB.

24 Former senior US State Department official, telephone interview with author, July 11, 2016.

tried to elicit consensus on a joint P5+1 statement on the need for sanctions against Iran: "Though we could not quite get the language we wanted with the Russians, we made a lot of progress … from that meeting, we decided that we had an opportunity with Medvedev and that he was going to consider the pressure track on Iran."[25]

Besides Fordow, Russian officials also grew frustrated over the Iranian government's handling of the proposal for the Tehran Research Reactor. The TRR plan was conceived as part of the larger US dual-track approach toward Iran, which envisioned both diplomatic engagement and a pressure track. Coming out of the policy review on Iran at the National Security Council (NSC) in early 2009, the overall objective of the dual-track approach was to incentivize Iran to behave more constructively, thereby depriving Tehran of the argument that it had been "singled out for special punitive treatment" by the international community.[26] The Russian Foreign Ministry viewed the new US approach to Iran with optimism,[27] also applauding Barack Obama's message for the Persian New Year to the Iranian people.[28] Indeed, the Obama administration's public posture vis-à-vis Iran was markedly different from that of the Bush administration, which was duly noted in Moscow.

McFaul explained that a conscious effort was made to promote engagement over the pressure track with Moscow first. This was reflected in the TRR proposal, an idea generated by the NSC, in which Russia was to be a lead actor.[29] According to the TRR plan, Iran would send 70-80 percent of its LEU to Russia, which would further enrich it up to 19.75 percent and pass it on to France, which in turn would manufacture fuel rods that the

25 Michael McFaul, telephone interviews with author, August 29 and September 26, 2016 (hereafter cited as "McFaul interview").
26 Former senior White House official, telephone interview with author, August 1, 2016.
27 "Transcript: FT Interview with Sergei Lavrov," *Financial Times,* March 25, 2009, https://www.ft.com/content/d32b732e-1920-11de-9d34-0000779fd2ac.
28 Thomas Erdbrink and Glenn Kessler, "Obama Message to Iran," *Washington Post,* March 21, 2009, http://www.washingtonpost.com/wp-dyn/content/article/2009/03/20/AR2009032000398.html.
29 McFaul interview.

TRR would use to produce medical isotopes.[30] Robert Einhorn, the US Department of State special adviser for nonproliferation and arms control, led a team to Moscow in early August 2009, where meetings were held with Deputy Foreign Minister Sergey Ryabkov and Rosatom's Nikolay Spassky to discuss the project. The Russians, Einhorn recalled, "immediately liked it"—both its substance, according to which Iran would not be asked to stop enrichment, and its format, implying a "coequal US-Russian partnership." [31]

Once the IAEA had proposed the TRR plan to Iran in October 2009, Tehran took a "generally positive" view but made clear it sought "several important technical and economic additions."[32] Specifically, Tehran insisted on sending its uranium abroad in stages and pushed for a simultaneous exchange plan, such that the TRR would receive fuel at the same time as LEU left Iranian territory.[33] While some Russian experts criticized what they saw as Iranian stalling, Russia's official position remained patient towards Iran.[34]

Once Iran rejected the TRR plan in its existing form on November 7, Russia continued to shield its ally from criticism, noting that Iran naturally sought the most advantageous conditions for itself.[35] In February 2010, reports that the Iranian government was reconsidering the TRR plan then elicited cautious optimism in Moscow.[36] However, only days later, Iran notified the IAEA of its intention to produce uranium of a higher enrichment level for the TRR itself. That drew a sharp response from Russian officials. Lavrov warned

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30 According to the proposal, the LEU sent by Iran to Russia would be 1,200 kilograms of product enriched to roughly 3.5 percent uranium-235. Sahar Nowrouzzadeh and Daniel Poneman, "The Deal That Got Away: The 2009 Nuclear Fuel Swap With Iran," Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2021, https://www.belfercenter.org/sites/default/files/2021-01/DealThatGotAway/TheDealThatGotAway.pdf.

31 Einhorn interview.

32 Aleksandr Samokhotkin, "Uranium Recovery," Vremya Novostei, October 30, 2009, p.1, in *Current Digest of the Russian Press,* Vol. 61, No. 43, pp. 6-8.

33 Samokhotkin, "Uranium Recovery."

34 "Moscow Urges Iran Six For 'Proper' Dialogue on Tehran," *Sputnik,* November 2, 2009.

35 "Otvet A. A. Nesterenko na vopros SMI" [(Russian Foreign Ministry Spokesperson) A. A. Nesterenko's Answer to Media Questions], November 19, 2009, http://www.mid.ru/web/guest/maps/ir/-/asset_publisher/HUPBmpXjn4Ob/content/id/272830.

36 Pyotr Iskenderov, "Turtles from Tehran," *Vremya Novostei,* February 4, 2010, p. 5, in *Current Digest of the Russian Press*, Vol. 62, No. 5, p. 16.

that "with the Iranian leaders not reacting to a number of constructive compromise agreements offered to them … I do not rule out that the UN Security Council will be compelled to reconsider this situation."[37]

In sum, frustration over the TRR plan falling through compounded Russian officials' anger at the Fordow revelation, heightening a sense among Moscow officials that Iran had not only deceived its Russian ally but also was unresponsive to constructive diplomatic efforts supported by the Kremlin.

Additional irritants in the Russian-Iranian relationship exacerbated the growing Russian frustration with Iran's diplomacy on the nuclear issue. First, Ahmadinejad's hostile rhetoric vis-à-vis Israel alarmed Moscow. Speaking with CNN's Fareed Zakaria in September 2009, Medvedev warned that Iran's nonrecognition of the existence of the state of Israel was "unacceptable in the modern world."[38] Moscow also criticized Iranian tests of medium-range ballistic missiles in September 2009. Lavrov commented that the tests could not but cause concern, given the unresolved situation around Iran's nuclear program.[39] Furthermore, in December, Ahmadinejad instructed his government to assess the damage done to Iran in the 1940s by members of the anti-Nazi coalition, which included the Soviet Union.[40]

Between the summer of 2009 and the spring of 2010, the subtle undertone of frustration with Iranian intransigence that had characterized Russian official rhetoric grew louder, notwithstanding Moscow's persistent cautioning against sanctions. Russian official statements increasingly emphasized that "the key to solving the crisis lies in the responsible behavior of Iran itself"[41] and expressed "regret" that Russian calls on Iran to work with the international

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37 Ministry of Foreign Affairs of the Russian Federation, "Russian Minister of Foreign Affairs to RIA Novosti, Russia Today Television Channel and Voice of Russia Radio Station, February 25, 2010," February 26, 2010 (hereafter cited as "Lavrov 2010 interview"), http://www.mid.ru/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/261460?p_p_id=101_INSTANCE_cKNonkJE02Bw&_101_INSTANCE_cKNonkJE02Bw_languageId=en_GB.

38 Medvedev CNN interview.

39 "Russia Concerned Over Iran Missile Launches, Calls for Restraint," *Sputnik,* September 28, 2009.

40 "Cold Spell in Russian-Iranian Relations," *Sputnik,* January 21, 2010.

41 "Interv'yu frantsuzskomu zhurnalu «Pari-match»" [(Russian President Dmitry Medvedev) Interview for the French Journal *Paris-Match*], February 25, 2010, http://kremlin.ru/events/president/news/6964.

community were not yielding results.[42] By June 2010, when Russia supported UN sanctions against Iran, Medvedev put Russia's disappointment with Iran's conduct in perhaps the starkest terms, warning that Iran "cannot continue constantly replicating its irresponsible behavior."[43]

However, this frustration notwithstanding, Russian sources criticized the Iranian leadership only in connection with the IAEA's questions vis-à-vis Tehran, which the Russian government wanted to see clarified. Lavrov brushed aside Ahmadinejad's threats that Russia could become one of Iran's worst historical enemies should it support UN sanctions, calling them "emotional" and "not properly translated into Russian."[44] Representatives of the Russian government were also careful never to evoke the notion that Russia had taken the US side against Iran, instead stressing that Russian policy on the nuclear issue was exclusively guided by its own national interest and could, therefore, never be "pro-American or pro-Iranian."[45]

In sum, although the Russian government remained less alarmed about Iranian nuclear ambitions than the United States did, Iran's behavior produced a shift in Russian perceptions of Iran as more intransigent—and of Ahmadinejad "as an unstable figure, adventurist, dangerous."[46] These growing doubts regarding Iran's reliability as a responsible interlocutor in turn shifted Russia's stance in the nuclear dispute toward support for UN sanctions.

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42 "Press-konferentsiya po itogam rossiisko-frantsuzskikh peregovorov" [(The Kremlin) Press Conference (with Russian President Dmitry Medvedev and French President Nicolas Sarkozy) on the Results of the Russian-French Negotiations], March 1, 2010, http://kremlin.ru/events/president/transcripts/7006.

43 "Sovmestnaya press-konferentsiya po itogam rossiisko-germanskikh peregovorov" [(The Kremlin) Press Conference (with Russian President Dmitry Medvedev and German Chancellor Angela Merkel) on the Results of the Russian-German Negotiations], June 5, 2010, http://kremlin.ru/events/president/transcripts/7973.

44 Ministry of Foreign Affairs of the Russian Federation, "Sergey Lavrov at Press Conference with Moldovan Deputy Prime Minister," May 27, 2010, http://www.mid.ru/web/guest/maps/md/-/asset_publisher/dfOotO3QvCij/content/id/248122?p_p_id=101_INSTANCE_dfOotO3QvCij&_101_INSTANCE_dfOotO3QvCij_languageId=en_GB.

45 "Russia Rejects Iran's Claims It Favours U.S. on Nuclear Issue," *Sputnik,* May 26, 2010.

46 Dmitry Trenin, director of the Carnegie Moscow Center, interview with author, Moscow, April 19, 2016 (hereafter cited as "Trenin interview").

The Iranian government increasingly appeared to undermine Russia's core objective of thwarting regional escalation.

Preventing Escalation: The Specter of Military Force and Regime Change in Iran

While sincere in seeking diplomatic engagement with Iran through its dual-track approach, the Obama administration never took the military option off the table. As a White House spokesperson explained, the president believed that "we must use all elements of our national power to protect our interest as it relates to Iran. That includes … diplomacy where possible." But when pressed to comment on the military option, he responded that "the President hasn't changed his viewpoint that he should preserve all his options."[47] The ambiguous White House discourse on "not ruling out anything" and warning that "consequences will follow" if Iran did not live up to its responsibilities continued through 2009 and into 2010.[48]

US officials never ruled out the military option but also did not "directly threaten" it in conversations with Russian officials, according to Celeste Wallander, who was deputy assistant secretary of defense for Russia, Ukraine, and Eurasia at the time. For that reason, Wallander said in 2016, the Kremlin became more willing to explore a political path of which sanctions would also be a part.[49] US officials drafting Resolution 1929 with their Russian counterparts were equally ambiguous concerning the military option as a point of leverage: "We kept saying we need real pressure to have a diplomatic path, and if that does not work, we will have to go down the military path."[50] That said, as a matter of official rhetoric, the Obama administration emphasized engagement over the pressure track with Iran.

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47 White House, Office of the Press Secretary, "Press Briefing by Robert Gibbs," January 29, 2009, https://www.presidency.ucsb.edu/node/285859.

48 White House, Office of the Press Secretary, "Press Briefing by Robert Gibbs," February 16, 2010, https://www.presidency.ucsb.edu/node/288624.

49 Celeste Wallander, former deputy assistant secretary of defense for Russia, Ukraine, and Eurasia, interview with author, Washington, DC, June 20, 2016 (hereafter cited as "Wallander interview").

50 Richard Nephew, former US official in the State Department Bureau of International Security and Nonproliferation, telephone interview with author, July 20, 2016 (hereafter cited as "Nephew interview").

In fact, Israeli military action against Iranian nuclear facilities appeared more likely than a US strike.[51] Prime Minister Benjamin Netanyahu continually pressed both the Obama and Medvedev administrations to take more meaningful action against Iran, and Israeli officials visited Washington and Moscow frequently to press the issue.[52] Medvedev's remarks in his CNN interview in September 2009 that Israeli President Shimon Peres had assured him that "Israel was not going to deliver any blows on Iran" drew sharp criticism by the Israeli government, which responded, "[O]f course we are considering all possible courses of action."[53] In March 2010 the Lebanese newspaper Al Manar reported that the Israeli Air Force had practiced simulated strikes on Iran's nuclear facilities.[54]

Russian officials expressed concerns about the possible use of force against Iran. These apprehensions were not new in 2009 and 2010. Indeed, Russia had been more fearful of US military action against Iran, particularly during Bush's second presidential term. In October 2007, Russian President Vladimir Putin stated at a Caspian Sea summit that "we should not even think of making use of force in this region."[55] Yet a Russian nervousness prevailed even after the presidential transition in Washington. In his September 2009 conversation with Zakaria, Medvedev warned that an attack on Iran would be "the worst thing that can be imagined. …What will happen after that? Humanitarian disaster, a vast number of refugees, Iran's wish to take revenge and not only upon Israel, to be honest, but upon other countries as well. An absolutely unpredictable development of the situation in the region. I believe that the magnitude of this disaster can be weighted against almost nothing."[56]

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51 Israel reportedly struck Syria's nuclear reactor in 2007 although it never officially admitted to what came to be known as "Operation Orchard."

52 In June 2009, Israeli Foreign Minister Avigdor Lieberman visited Moscow. Israeli President Shimon Peres held talks with Medvedev in Moscow on August 18, 2009. On February15, 2010, Medvedev and Putin met with Netanyahu in Moscow.

53 Nikolai Surkov, "Israeli Foreign Ministry Refutes Russian President," *Nezavisimaya Gazeta,* September 22, 2009, p. 1, in *Current Digest of the Russian Press,* Vol. 61, No. 38, p. 18.

54 "Israel Gets Ready to Strike at Iran's Nuclear Sites," *Sputnik,* March 29, 2010.

55 Nazila Fathi and C. J. Chivers, "In Iran, Putin Warns Against Military Action," *New York Times,* October 17, 2007, http://www.nytimes.com/2007/10/17/world/middleeast/17iran.html.

56 Medvedev CNN interview.

Russian statements over subsequent months manifested an acute awareness that Iran was located close to Russia's borders and that military escalation would have grave implications for the entire region. There was also a fear that striking Iran—thereby "driving it into a corner"—would increase Tehran's determination to pursue development of nuclear weapons, since Iranian hard-liners would gain the upper hand.[57] While the threat of a US military strike receded from Obama's public rhetoric, it remained of concern to Moscow and was compounded by the worry that Israel might take unilateral action.

Related to this fear of regional escalation was an ongoing apprehension about US intentions to bring about regime change in non-friendly countries in the region, including Iran. Following Iran's presidential elections in June 2009, in which incumbent President Mahmoud Ahmadinejad was reelected by 62 percentage points, the United States expressed procedural concerns and criticized the regime's crackdown on protesters in the aftermath of the vote.[58] Overall, however, US criticism was rather cautious and sporadic, and the administration was careful to emphasize that its pressure on Iran's nuclear policies did not pursue the goal of regime change.[59]

The Russian government's position on the Green Movement protests, which followed Ahmadinejad's reelection, consisted in stressing that they were Iran's internal business and that Russia supported a stable government.[60] In a clear hint to the United States, Deputy Foreign Minister Andrey Denisov warned that "behind certain calls for the protection of human rights in Iran, the naked eye can detect an intention to change the leadership in this

57 "Interv'yu S. V. Lavrova amerikanskomu televedushhemu Charli Rouzu" [S. V. Lavrov's Interview With American TV Presenter Charlie Rose], September 22, 2010, http://www.mid.ru/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/235760.

58 White House, Office of the Press Secretary, "Press Briefing by Robert Gibbs," June 15, 2009, https://www.presidency.ucsb.edu/documents/press-briefing-press-secretary-robert-gibbs-144.

59 White House, Office of the Press Secretary, "Press Briefing by Robert Gibbs, Ben Rhodes, and Michael McFaul," April 8, 2010, https://www.presidency.ucsb.edu/node/288134 (hereafter cited as "Gibbs-Rhodes-McFaul press briefing").

60 Medvedev interview with Italian media.

country."[61] The idea that US sanctions were, in the final instance, intended to produce regime change in Tehran was also widespread among Russia's expert community. It was suspected that sanctions against Iran's energy sector, in particular, would be aimed at stoking popular unrest. Hence the Kremlin's insistence on sanctions narrowly targeting proliferation activities.[62] Iran observer Nikolay Kozhanov, for instance, argued that the West intended Resolution 1929 to galvanize a qualitatively new level of domestic support for the Iranian opposition.[63]

While the possible use of US or Israeli military force, including in the context of those countries' perceived intentions to change the Iranian leadership, worried Russian officials during the period under investigation, these apprehensions were not the exclusive driving force behind Russian cooperation on Resolution 1929. Indeed, relative to Bush's second term, the likelihood of military action against Iran had subsided during the Obama administration, given the United States' explicit intent to engage Iran through diplomacy. Rather, a concern about nuclear proliferation, Iranian intransigence, and fear of regional escalation combined to set the stage for Russia's support for UN sanctions.

Russia's Status as Permanent Member of the UN Security Council

Finally, a Russian interest in preventing the United States and its allies from imposing unilateral sanctions against Iran appears to have played into Moscow's cooperation in the multilateral sanctions effort, sustained by Russia's concerns relating to its status as a permanent member of the UN Security Council. Lavrov, in remarks on Iran in October 2009, reiterated that the pressure track "does not imply any unilateral sanctions, apart from the

61 "Interv'yu A. I. Denisova «Gazete.Ru»" [(Russian First Deputy Foreign Minister) A. I. Denisov's Interview for *Gazeta.Ru*], August 21, 2009, http://www.mid.ru/web/guest/foreign_policy/news/-/asset_publisher/cKNonkJE02Bw/content/id/282848.

62 Nina Mamedova, "Sanktsionnyi Rezhim V Otnoshenii Islamskoi Respubliki Iran I Ego Vliyanie Na Situatsiiu V Strane" [The Sanctions Regime Against Iran and its Impact on the Situation in the Country], in Nina Mamedova, ed., *Sanktsii i Ikh Vliyanie na Iran* [Sanctions and Their Impact on Iran] (Moscow: IV RAN, 2012).

63 Nikolay Kozhanov, "O Vliyanii Ekonomicheskikh Sanktsii Na Vnutripoliticheskuyu Situatsiiu V Irane" [On the Impact of Economic Sanctions on the Domestic Political Situation in Iran], in Mamedova, *Sanctions and Their Impact on Iran.*

UN Security Council, nor the creation of any other formats where the issue of sanctions would be discussed."[64] Yet a threat of the United States moving unilaterally, should it prove unfeasible to build consensus at the United Nations, emanated from official White House discourse.[65] And Moscow heard the message. "It happens on a lot of issues," Wallander argued, that "if the US has unilateral or other multilateral options, the Russians are willing to work through the UN because they can then shape the contents."[66]

Given the prestige associated with its permanent seat on the UN Security Council, it was also vital to Russia that Resolution 1929 be passed before the Comprehensive Iran Sanctions, Accountability, and Divestment Act (CISADA), a US law authorizing further unilateral sanctions against Iran:[67] "Russia did not want to see US legislation before UN action, or look like they were being compelled by US legislation."[68] When CISADA was eventually passed, the move was seen as "ne po-partnerskii" ("uncooperative").[69] The Russian Foreign Ministry commented that those "considering additional sanctions against Iran, more stringent than those provided by the UNSC," engage in "attempts to place themselves above the Security Council," which is "unacceptable" to Russia.[70]

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64 Ministry of Foreign Affairs of the Russian Federation, "Transcript of Remarks and Response to Media Questions by Russian Minister of Foreign Affairs Sergey Lavrov at Joint Press Conference Following Talks with US Secretary of State Hillary Clinton, Moscow," October 13, 2009, http://www.mid.ru/web/guest/maps/us/-/asset_publisher/unVXBbj4Z6e8/content/id/277730?p_p_id=101_INSTANCE_unVXBbj4Z6e8&_101_INSTANCE_unVXBbj4Z6e8_languageId=en_GB.

65 White House, Office of the Press Secretary, "Press Briefing by Robert Gibbs," April 19, 2010, https://www.presidency.ucsb.edu/node/288869.

66 Wallander interview. This was confirmed by Russian experts.

67 "Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010," Pub. L. No. 111-195, https://www.congress.gov/111/plaws/publ195/PLAW-111publ195.pdf.

68 Nephew interview.

69 Russian Foreign Ministry official, interview with author, Moscow, October 4, 2016.

70 Ministry of Foreign Affairs of the Russian Federation, "Russian MFA Press and Information Department Commentary: UN Security Council's Adoption on June 9 of Resolution Regarding Iran," June 9, 2010, http://www.mid.ru/web/guest/kommentarii_predstavitelya/-/asset_publisher/MCZ7HQuMdqBY/content/id/246542?p_p_id=101_INSTANCE_MCZ7HQuMdqBY&_101_INSTANCE_MCZ7HQuMdqBY_languageId=en_GB.

Russian Efforts at Shielding Its Interests vis-à-vis Iran

While Russian diplomats worked within the P5+1 to put pressure on Iran, they engaged in different negotiation strategies to protect Russian interests with regard to that country. Moscow sought to restrict the sanctions effort to proliferation-related activities and shield Russian commercial ties with Tehran. Russia's economic interests vis-à-vis Iran were mainly in the fields of arms sales and civil nuclear energy cooperation. Moscow was also acutely aware of Iran's importance as a reliable partner in Russia's neighborhood, as a large Muslim neighbor located south of Russia. Ideological considerations mattered too. Especially since the mid-2000s, the Russia-Iran tandem had been partially sustained by a shared commitment to thwart US hegemony and Western-style democratization, as well as by a shared hostility to the revisionist ambitions of ethnic minorities.[71]

At the same time, and to the surprise of US officials, the Russian leadership decided not to provide Tehran with the promised S-300 missile defense system even though Moscow had negotiated for the deal to be exempt from Resolution 1929. This Russian gesture suggests that a hope of generating US reciprocity in return for Russia's cooperation on Iran outweighed the desire to support Iran. That said, a desire to silence those arguing for military action against Iran might also have played into the Russian leadership's thinking on banning the S-300 sale, a decision that would keep Tehran more exposed. Indeed, in withholding the system from Iran, Russia would be able to point to its ally's defense vulnerabilities vis-à-vis those in the West arguing that the use force against Iran was the only pathway for eliciting Iran's policy change on the nuclear dossier.

"Horse-trading" within the Parameters of Resolution 1929

Once the United States had decided that its engagement of Iran, which had centered on the TRR proposal, was failing, it moved into "sanctions mode" in late 2009. US Ambassador to the United Nations Susan Rice was instructed to get "the toughest possible sanctions" in the United Nations, in terms of

71 Azadeh Zamirirad, "Iran und Russland: Perspektiven der bilateralen Beziehungen aus Sicht der Islamischen Republik" [Iran and Russia: The Islamic Republic's Perspectives on Bilateral Relations], Stiftung Wissenschaft und Politik, 2017, https://www.swp-berlin.org/fileadmin/contents/products/studien/2017S07_zmd.pdf.

both breadth (the range of sectors targeted) and depth (the extent to which sanctions would "bite"). In the event of a trade-off between these objectives, breadth was to take precedence over depth since covering more sectors would give the United States a "hook" for subsequent unilateral sanctions, should the Obama administration consider them necessary.[72] However, given its economic and security interests vis-à-vis Iran, Moscow continued to resist the scope of Resolution 1929. It is in the context of this overarching tension that US-Russian "give and take" in negotiations played out.[73]

Sanctions Targeting Iran's Energy, Financial, and Military Sectors

Moscow focused on the economic dimension of sanctions, partly given its awareness of the US Congress's impending CISADA legislation, which was "the elephant in the room" and the reason why "Russia was not ready to give so much" on Resolution 1929.[74] Russian concerns might also have reflected the fact that the Iran talks followed a deep recession in Russia. Moscow insisted, for instance, that any provisions addressing Iran's energy or financial sector be adopted using what US officials characterized as "qualified language" and be related only to proliferation activities.[75]

Regarding the energy sector, the United States insisted on a reference in the preamble to Resolution 1929, acknowledging "the potential connection between Iran's revenues derived from its energy sector and the funding of Iran's proliferation-sensitive nuclear activities." Beyond this line, which was "the best language the US could get with Russia,"[76] US officials failed to obtain Russian and Chinese support for including energy-related sanctions. While Chinese interests in Iran's energy sector were judged to be more significant than Russia's, Moscow also stood to lose from restrictions. In

72 Einhorn interview.

73 While other players were involved in the P5+1 negotiations, focusing on the Russia-US dimension of the talks is warranted since the two actors were key to achieving consensus on Resolution 1929. Russian consent was considered crucial to obtaining China's support.

74 Former legal adviser at US State Department, interview with author, Washington, DC, June 24, 2016.

75 Former US official serving at the US mission to the United Nations, interview with author, Washington, DC, June 23, 2016.

76 Former US State Department official, interview with author, Washington, DC, June 29, 2016.

March 2010, for instance, Lukoil announced that it had to abandon its Iranian Anaran oil project, in which it held a 25 percent stake, given US sanctions.[77] The Kremlin was concerned not just about current losses for Russian companies but also thwarted future opportunities in Iran's energy sector. Drawing up an initial balance sheet of Resolution 1929's impact on the Iranian economy in December 2010, Russian Iran observer Vladimir Sazhin noted the potential for more extensive cooperation in the oil and gas sector, joint construction of power plants, and extraction of coal reserves in Iran's eastern regions.[78]

Pursuing economic leverage in negotiations, Moscow also lobbied for the lifting of US sanctions on Russian companies that had previously been targeted for their links to Iran. In a March 2010 notice in the US Federal Register, the State Department announced that it would lift restrictions against the Russian space organization Glavkosmos, which had been sanctioned in 1998 over proliferation activities related to Iran's missile program.[79] Throughout the months leading up to Resolution 1929, Russian officials continued to press the Obama administration to lift sanctions against other Russian firms, for example, Rosoboronexport and its subsidiaries.[80] When the Obama administration, less than a month before the UN vote, removed restrictions against four Russian entities, the US press characterized the decision as a last-ditch effort to secure Russian support for the resolution.[81]

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77 "Russia's LUKoil Says Iran Project Dropped Over Sanction," *Sputnik,* March 24, 2010. One reason why Lukoil willingly complied was the prospect of further cooperation with US companies during the reset.

78 Vladimir Sazhin, "Iran: December 2010 – Economic Situation," Institut Blizhnevo Vostoka, February 10, 2011, http://www.iimes.ru/?p=12123.

79 Department of State, "Lifting of Nonproliferation Measures Against One Russian Entity, Public Notice 6915," *Federal Register,* Vol. 75, No. 46, March 10, 2010, https://www.gpo.gov/fdsys/pkg/FR-2010-03-10/pdf/2010-5135.pdf. The United States also lifted sanctions against a second Russian company, Baltic State Technical University.

80 "Moscow to Press U.S. to End Sanctions on Russian Firms," *Sputnik,* May 7, 2010.

81 Colum Lynch and Glenn Kessler, "Moscow Makes Gain in Iran Deal as US Lifts Sanctions Against Russia," *Washington Post,* May 22, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/05/21/AR2010052102590.html.

Other influential observers, including two US senators echoed this criticism.[82] Russia's lobbying on sanctions relief for its own companies was clearly perceived as a leverage play in the negotiations on Resolution 1929.

The Russian negotiators in the P5+1 achieved a further carve-out concerning Russia's work on the Bushehr complex. Resolution 1929 makes multiple references to activities related to heavy water,[83] but it is silent on existing cooperation in light-water reactor technology, including Bushehr. While Russia had stalled completion of the project, Putin's visit to Tehran in October 2007 generated new momentum and Russian officials confirmed the reactor would be operating by late 2008.[84] But by 2009, construction was still ongoing, hampered by further delay; Rosatom said the reasons were purely technical. Western media interpreted the stalling as a ploy to put Russian pressure on Iran at a time when the latter was perceived as intransigent toward the P5+1.[85] The Russian government, however, dismissed the notion that completion of Bushehr had become a bargaining chip with Iran. Indeed, although Russia jumped on the bandwagon of the international sanctions effort against Iran, Moscow made sure its cooperation in civil nuclear energy was not affected. In March 2010, Putin stated that Bushehr's first unit would become operational in the summer.[86]

Two calculations determined Russia's position on Bushehr. On the one hand, since Russia stood to gain financially from continued cooperation with Iran on that project, pushing for the project to be exempt from Resolution 1929 was part and parcel of Moscow's effort to protect its economic interests in Iran. The Russian government also likely anticipated Iranian displeasure with Russia's "dual stick" of supporting Resolution 1929 and subsequently

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82 Daniel Coats, Charles Robb, and Charles Wald, "Meeting the Challenge: When Time Runs Out: An Update to the Bipartisan Policy Center Report on U.S. Policy Toward Iranian Nuclear Development," Bipartisan Policy Center, June 2010, https://bipartisanpolicy.org/wp-content/uploads/2019/03/BPC-IranReport-fnl-062210.pdf.

83 Points 6, 7, and 13 of Resolution 1929.

84 Mark N. Katz, "Russian-Iranian Relations in the Obama Era," *Middle East Policy,* Vol. 17, No. 2, Summer 2010, pp. 62-69.

85 Katya Golubkova, "Russia Delays Iran's Bushehr Nuclear Power Station," *Reuters,* November 16, 2009, http://www.reuters.com/article/idINIndia-43978820091116.

86 "Iran's Bushehr Nuclear Plant to Be Launched This Summer – Putin," *Sputnik News,* March 18, 2010.

banning the S-300 sale and might have calculated that one carrot among many sticks would mollify Iran. A second reason was likely the anticipated low level of US resistance. Even though US Secretary of State Hillary Clinton had publicly criticized Russia's intention to start Bushehr in July 2010 as "premature,"[87] she had "been speaking off an old set of talking points" at the press conference, since "the US had dropped objection to Bushehr already under the Bush administration, realizing it was a fait accompli and that Russia had agreed to steps, like spent fuel return, that would lessen proliferation concerns."[88]

Furthermore, when it came to new sanctions designations—whether entities or individuals—to be included in Resolution 1929, Russian economic interests also dictated Moscow's negotiating position. As a US negotiator recalled, the US team would "give a long list of targets, but Russian negotiators would cross out any names to which their government had links"; Moscow's message was "we will not pay a price."[89] The designation process was also complicated by the fact that the United States and Russia did not have common data on Iran, such that "the process of giving just enough intelligence to convince Russia that someone was worth designating was tedious."[90]

Finally, the restriction on weapon sales to Iran was specifically negotiated by Russian officials to exclude the S-300 missile defense system. Point 8 of the adopted text includes a ban on the sale of major conventional weapons as defined by the UN Register of Conventional Arms, but it also calls on states to show restraint in the supply to Iran of arms not covered by the embargo.[91] When it came to the Security Council, as a legal matter, Russian officials were "very resistant to the notion of any restrictions on arms, and right until the very end opposed any formal disruption of the S-300 sale. They agreed on

87 "Russia, US Disagree Over Iran Bushehr Start-Up," *Al Arabiya,* March 18, 2010, https://www.alarabiya.net/articles/2010/03/18/103429.html.
88 John Beyrle, former US ambassador to Russia, telephone interview with author, July 11, 2016.
89 Former US official serving at the US mission to the United Nations, Washington, DC, June 23, 2016.
90 Nephew interview.
91 Point 8 of Resolution 1929.

the side to rip it up, but they wanted to be clear that they had no obligation under the resolution to do so."[92]

In sum, the Russian government sought to protect its economic interests and political relationship with Iran by insisting on qualified language and carve-outs in Resolution 1929.

As a matter of public rhetoric, however, Russia's pushback against economic sanctions was couched in a humanitarian discourse. Lavrov warned that Russia could not support an effort in which "observance of the non-proliferation regime [would] be used as a pretext to push for any other aims, including the strangulation of Iran, adoption of measures that will actually worsen the humanitarian situation."[93] The Russian government's instrumentalization of a humanitarian discourse might have been partially intended to deflect attention from its commercial interests, but it was also likely driven by a real concern with Iran's domestic and regime stability.

Russia's Negotiating Strategy: "Watering Down," Not "Stalling"

While seeking to protect economic leverage in Resolution 1929, Russian diplomats did not push for significant delays in the P5+1 negotiations. When Iran, Turkey, and Brazil announced a last-ditch offer in mid May 2010, according to which Tehran would ship LEU to Turkey for storage and receive uranium of a higher enrichment level for use in the TRR in return, Moscow's reception was lukewarm. President Medvedev wished his Brazilian counterpart Lula Da Silva success in his impending talks with the Iranian leadership, saying they might "constitute the last chance" for diplomacy before the United Nations adopted sanctions.[94] However, his reaction three days later to news of the Brazil-brokered deal was cautious. The Russian president commented that the work done by his Turkish and Brazilian colleagues should be "welcomed," that Russia intended to study the agreement's details, and that "a short pause" in international

[92] William J. Burns, former US undersecretary of state for political affairs, interview with author, Washington, DC, June 29, 2016 (hereafter cited as "Burns interview").
[93] Lavrov 2010 interview.
[94] "Sovmestnaya press-konferentsiya s Luloi da Silvoi" [(Russian President Dmitry Medvedev) Joint Press Conference with Lula Da Silva], May 14, 2010, http://kremlin.ru/events/president/transcripts/7751.

negotiations to determine whether the tripartite agreement might be sufficient "won't be superfluous."[95]

Such public rhetoric on the Turkish-Brazilian offer notwithstanding, Moscow did not push to stall the UN process.[96] While the United States rejected the May proposal for falling short in a number of areas, according to a US diplomat, "Russia did not have as much of a viscerally negative reaction to the substance as we did, but it did not take us a lot of convincing in the P5+1 that Iran was playing games."[97] This sentiment was echoed in Moscow's expert community, with Aleksey Arbatov of the Institute of World Economy and International Relations calling the initiative a "diplomatic manoeuvre, aimed at dividing the UN Security Council."[98] According to a Russian official, Moscow was even "offended that Iran accepted from Turkey and Brazil an option that it cast aside when it emanated from Russia," which again suggests that the importance Russia attaches to its own status as a key intermediary on the Iran nuclear dossier partially drives its policy.[99]

The Dispute over S-300 Delivery

The present discussion of Russian insistence on protecting its economic interests within the international sanctions effort needs to be complemented by a more in-depth look at the S-300 issue. While Russia's prospective delivery of the system to Iran featured in the negotiations on Resolution 1929 and was resolved to Moscow's satisfaction, it also figured more broadly as a bargaining chip in Russian-US diplomacy during 2009 and 2010. In remaining vague about its intentions to proceed with delivery of the

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95 "Sovmestnaya press-konferentsiya po itogam rossiisko-ukrainskikh peregovorov" [(Russian President Dmitry Medvedev and Ukrainian President Viktor Yanukovych) Joint Press Conference on the Results of the Russian-Ukrainian Negotiations], May 17, 2010, http://kremlin.ru/events/president/transcripts/7781.

96 Gary Samore, former White House coordinator for arms control and weapons of mass destruction, telephone interview with author, June 22, 2016 (cited hereafter as "Samore interview").

97 Nephew interview.

98 "Iran's Nuclear Fuel Swap Aimed at Dividing UN," Sputnik, May 17, 2010.

99 "Russia: Iran's Deal With Brazil, Turkey Seen as Challenging Global Hierarchy," *Gazeta.Ru,* May 20, 2010, quoted in Clément Therme, "Le triangle géopolitique entre la Turquie, l'Iran et la Russie: entre ruptures et continuités," [The geopolitical triangle between Turkey, Iran and Russia: between ruptures and continuities] in Firouzeh Nahavandi, ed., *Turquie: Le déploiement stratégique* [Turkey: Strategic deployment] (Bruylant: Brussels, 2012), pp. 247-268.

S-300, Russia retained leverage with the United States, even as its position was moving toward support for the pressure track on Iran. Whether or not ambiguity on the S-300 delivery was deliberately conceived by Moscow as a bargaining chip, it was perceived as such by many officials in Washington. When the Russian government announced a decree prohibiting the sale in September 2010, US officials widely welcomed what they viewed as a "nice gift," attributing it partially to the atmosphere of the reset.[100] However, some discerned a calculated Russian leverage play to deprive those in the West who argued for the use of force against Iran of their rhetorical ammunition by keeping Iran militarily vulnerable. According to these US officials, Tehran's acquisition of the S-300—which would enhance the defense of Iran's nuclear program and installations—would likely precipitate immediate military action by an Israeli government that was determined to prevent the Iranians from solidifying their invulnerability. By withholding the S-300, according to this logic, Russia would be able to point to the impermissibility of the use of force against Iran, instead emphasizing the need for further diplomatic efforts to solve the dispute.

Russia's Stalling: To Deliver, or Not to Deliver?

Tehran and Moscow had signed a US$800 million contract for the delivery of the S-300 in December 2007. Throughout the period investigated in this chapter, Russia stalled in fulfilling the contract and sent mixed signals regarding its future intentions. After RIA Novosti reported in mid-December 2008 that S-300s had been delivered to Iran, Russia's Federal Service for Military-Technological Cooperation (FSMTC) denied the news.[101] In February 2009, a source in the Russian defense sector told *Kommersant* that "the contract on the S-300s can be implemented at any time … but in order to take action a political decision has to be made, and that still hasn't happened."[102] Later in the year, a Russian official noted

100 Samore interview.

101 Andrey Terekhov, "Moscow Is Being Pressured to Cancel Contract With Iran," *Nezavisimaya Gazeta,* December 24, 2008, p. 1, in *Current Digest of the Russian Press,* Vol. 60, No. 51, pp. 18-19.

102 Aleksandr Gabuev, "Russia Doesn't Want to Supply Surface-to-Air Missile Systems Because of Barack Obama," *Kommersant,* February 17, 2009, p. 7, in *Current Digest of the Russian Press,* Vol. 61, No. 7, p. 19.

that, "the contract for delivering S-300 systems to Iran was indefinitely put on ice essentially the instant it was signed" and "has ceased to be a simple commercial transaction,"[103] hinting at the mounting international pressure on Iran.

Russian Perceptions of US and Israeli Concerns

Moscow was acutely aware of US and Israeli apprehensions regarding the prospective S-300 sale. The issue featured in US-Russian conversations throughout 2009 and, as McFaul recalled, "the US was obsessed with stopping that delivery, and at every meeting the president, the vice president, or [national security adviser] General [James] Jones had in Moscow, we expressed our worries that if the transfer started, it would increase the probability of an Israeli preemptive attack and there would be no chance of negotiations with Iran."[104] Indeed, Israel was vocal in warning the Kremlin not to provide Tehran with the system. Visiting Moscow in June 2009, Israeli Foreign Minister Avigdor Lieberman reminded Moscow that Israel could at any time resume its own weapons deliveries to Georgia, a country with which Russia had fought a short war in August 2008.[105] Following the visit, the *Haaretz* newspaper reported that Israel had intensified its efforts to prevent deliveries of Russia's S-300 air defense systems to Iran, citing a phone conversation between Netanyahu and Putin, as well as a Paris meeting between Israeli Defense Minister Ehud Barak and Russian Chief of General Staff Nikolay Makarov.[106] Israeli pressure on Russia continued through the autumn of 2009 and into 2010.

September 2010: Ban on the S-300 Delivery by Presidential Decree and US Interpretations

Although the Russian government had staunchly negotiated for the S-300 not to be covered by Resolution 1929, ambiguous statements as to the implications of that resolution emanated from Moscow after it was passed.

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103 Artur Blinov, "Tehran Could End Up Without S-300s," *Nezavisimaya Gazeta,* October 22, 2009, p. 7, in *Current Digest of the Russian Press,* Vol. 61, No. 42, pp. 15-16.
104 McFaul interview.
105 "Russia, Israel Need Common Approach On Arms Exports – Lieberman," *Sputnik,* June 1, 2009.
106 Barak Ravid, "Netanyahu To Putin: Stop Selling Missiles To Iran," *Haaretz,* June 29, 2009, http://www.haaretz.com/netanyahu-to-putin-stop-selling-missiles-to-iran-1.279003.

While the resolution did not prohibit the sale of missile defense systems, it contained an appeal for all countries to exercise restraint in supplying Iran with any other arms or related material. Following its adoption, the FSMTC initially stated that "naturally, the contract to supply Tehran with S-300 will be frozen."[107] Meanwhile, the Foreign Ministry noted that missile defense systems of the S-300 type were "not covered by the UN Register of Conventional Arms that was cited in the Resolution on Iran," a position that was then echoed by the FSMTC's director.[108] Providing clarity amid the cacophony of opinions, Lavrov said that a presidential decree would be prepared in order to resolve the issue. On September 22, 2010, the Kremlin announced that Medvedev had banned the delivery of S-300 missile systems, armored vehicles, warplanes, helicopters, and ships to Iran. Russian sources confirmed that the president's decision was "unpopular" among Russian elites[109] while likely condoned by then-Prime Minister Putin, who agreed to what was perceived as a friendly gesture towards the West.

Medvedev's decision was received with surprise and elation by the Obama administration. Gary Samore, then the White House coordinator for arms control and weapons of mass destruction, recalled that he thought it was "a nice gift from Moscow."[110] Einhorn remembered he was "baffled" reading the Kremlin's explanation for the ban, which referred to a UN resolution that had been specifically negotiated not to pertain to the S-300.[111] However, some US sources offered an alternative interpretation of Russian actions. In banning the S-300 delivery, Wallander argued, Russia kept Iran more vulnerable and could thus appeal for military restraint by Iran's opponents: "They did not want Iran to be struck by military action in order to keep the focus on the political track." This calculation, Wallander concedes, was not inconsistent with Washington's own preferences.[112]

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107 Elena Suponina and Aleksandr Lomanov, "Arms Freeze," *Vremya Novostei,* June 11, 2010, p. 5, in *Current Digest of the Russian Press,* Vol. 62, No. 22, pp. 12-14.

108 Suponina and Lomanov, "Arms Freeze."

109 Alexey Arbatov noted the status risks (and possible loss of markets) to be considered in the event of nondelivery of the weapon systems. While weapon sales only made up 2 to 3 percent of all Russian exports at the time, they were still important reputationally. Alexey Arbatov, head of the Center for International Security at the Institute of World Economy and International Relations, interview with author, Moscow, March 29, 2016.

110 Samore interview.

111 Einhorn interview.

112 Wallander interview. Other US sources made similar comments.

In sum, while Moscow subscribed to the need to enhance economic pressure on Iran, believing that Tehran's engagement with the international community on the nuclear issue had to change, Russian officials sought to protect their existing economic ties and political relations with Iran. To this end, they spoke "loudly about what they were still doing with Iran and made very little noise about what they were not going to do as a result of sanctions."[113] Yet these Russian maneuvers played out within a mainly cooperative approach to the multilateral sanctions effort against Tehran. As will be discussed in the following section, Russian policy was further driven by larger interests in its reset with the United States, especially accommodation over arms control and missile defense, and US support at the WTO in the context of Russia's bid to accede to the organization.

Russian Expectations of Reciprocity as a Driver of Cooperation

Defining Linkage Diplomacy, Diffuse Reciprocity, and the Reset

While the Russian government, in cooperating with the United States on the Iranian nuclear issue was, first and foremost, driven by regional concerns, there is evidence that Russian officials pursued limited linkage diplomacy with the United States. For the purpose of this analysis, linkage diplomacy is understood to entail a Russian strategy of trying to make cooperation on the Iran nuclear file *conditional upon* US behavior on a different issue in the US-Russian bilateral relationship. Such linking of issues is considered ubiquitous in international politics and has received extensive treatment in the international relations literature on cooperation.[114]

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113 Interview with former legal adviser at US State Department.

114 For instance, Michael D. McGinnis, "Issue Linkage and the Evolution of International Cooperation," *Journal of Conflict Resolution,* Vol. 30, No. 1, March 1986, pp. 141-170. As William Wallace notes, "linkage between unrelated or only loosely-related issues in order to gain increased leverage in negotiation is an ancient and accepted aspect of diplomacy." William Wallace, "Issue Linkage Among Atlantic Governments," *International Affairs,* Vol. 52, No. 2, April 1976, p. 164. Addressing how issues can be linked in interstate diplomacy with the goal of obtaining advantages in negotiation, Tollison and Willett contend that "through the formal or informal linking of issues … the possibility emerges of indirectly paying compensation through positions taken in other negotiations." Robert D. Tollison and Thomas D. Willett, "An Economic Theory of Mutually Advantageous Issue Linkage in International Negotiations," *International Organization,* Vol. 33, No. 4, Autumn 1979, pp. 425-449.

In supporting US policy on the Iran nuclear issue, Russia hoped that, at a minimum, its cooperation would sustain the atmospheric change in bilateral relations that had been generated by the reset. More optimistically, Moscow expected there would be progress with the United States on arms control, European missile defense, Russia's WTO accession, and the bilateral agreement for peaceful nuclear cooperation, or "123 agreement."[115] To that end, the evidence detailed below suggests that rather than engaging in direct linkage diplomacy by asking the United States explicitly for quid pro quos on these issues, Moscow hoped accommodation would materialize through what could be characterized as US "diffuse reciprocity." While "specific reciprocity" in interstate cooperation implies that partners exchange items of equivalent value in a strictly delimited sequence, diffuse reciprocity involves an exchange in which the definition of equivalence is less precise and the sequence of events less narrowly bounded. Nevertheless, although the nature of rewards in diffuse reciprocity might be underspecified, rough equivalence has to be integral to it, in the most basic sense in which good is unmistakably returned for good and bad for bad.[116]

Engaging Russia in the Reset: Win-Win Outcomes and a Multidimensional Relationship

The Obama administration's dual track approach toward Iran was embedded in a broader foreign policy strategy that also sought to open a new chapter in relations with Russia. Speaking in February 2009 at the Munich Security Conference, Vice President Joe Biden said Russia and the United States should "reset" their relationship.[117] A month later, Lavrov and Clinton pressed a symbolic reset button at their meeting in Geneva.

The core US objectives in resetting relations with Russia were to agree on a follow-up agreement to START I; to achieve Russian support for the

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[115] Section 123 of the US Atomic Energy Act requires the US government to have such agreements with its nuclear trading partners.

[116] On specific versus diffuse reciprocity, see Robert O. Keohane, "Reciprocity in International Relations," *International Organization,* Vol. 40, No. 1 (Winter 1986), pp. 1-27.

[117] White House, Office of the Vice President, "Remarks by Vice President Biden at 45th Munich Conference on Security Policy," February 7, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-vice-president-biden-45th-munich-conference-security-policy (hereafter cited as "Biden Munich remarks").

Northern Distribution Network, which allowed the United States to send troops and supplies through Russia to Afghanistan; and to obtain Russian support for a nuclear security conference, as well as for international sanctions against Iran. Optimism regarding the achievability of these objectives prevailed after Obama's first Moscow visit in the summer of 2009, given the joint understandings adopted with the Russian government.[118]

The US strategy in pursuing these objectives entailed two core elements—identifying win-win outcomes and building a multidimensional relationship.[119] According to McFaul, the win-win philosophy was sustained by the assumption that "on most strategic issues that the United States is pursuing, we don't see a disagreement with the Russians."[120] McFaul also emphasized the desired multidimensionality of the new relationship, including building people-to-people ties, noting that "this is not 1974 … where we [just] do an arms control agreement with the Soviets."[121] At the same time, the United States was careful to point out that its approach would not imply a recognition of Russian special interests in the post-Soviet space. Commenting on Biden's trip to Georgia and Ukraine in the summer of 2009, his national security adviser, Antony Blinken, reaffirmed that "our

118 White House, Office of the Press Secretary, "Press Conference by President Obama and President Medvedev of Russia," July 6, 2009, https://obamawhitehouse.archives.gov/the-press-office/press-conference-president-obama-and-president-medvedev-russia.
119 McFaul interview.
120 White House, Office of the Press Secretary, "Press Briefing by Gary Samore, National Security Council Coordinator for Arms Control and Nonproliferation; Ambassador Alex Wolff, Deputy Permanent Representative to the United Nations; and Mike McFaul, Senior Director for Russian Affairs on Thursday's UN Security Council Meeting and the President's Meeting Today With President Medvedev of Russia," September 23, 2009, https://obamawhitehouse.archives.gov/realitycheck/the-press-office/press-briefing-gary-samore-ambassador-alex-wolff-and-mike-mcfaul (hereafter cited as "Samore-Wolff-McFaul press briefing").
121 White House, Office of the Press Secretary, "Press Briefing on the President's Trip to Russia, Italy, and Africa by Denis McDonough, Deputy National Security Advisor for Strategic Communications, Michael Froman, Deputy National Security Advisor for International Economic Affairs, Michelle Gavin, Special Assistant to the President and Senior Director for African Affairs, and Michael McFaul, Special Assistant to the President and Senior Director for Russian and Eurasian Affairs," July 1, 2009, https://www.presidency.ucsb.edu/documents/press-briefing-the-presidents-trip-russia-italy-and-africa-denis-mcdonough-deputy-national (hereafter cited as "McDonough- Froman-Gavin-McFaul press briefing").

efforts to reset relations with Russia will not come at the expense of any other country."[122]

By 2010, US officials felt that the reset was yielding tangible results. Speaking to the press after the signing of New START, McFaul reminded the audience "of where this [US-Russia] relationship was just fifteen or eighteen months ago … a low point" and went on to argue that the countries now enjoyed a "multidimensional relationship."[123] The density of high-level contacts was also significant, with Obama and Medvedev meeting seven times between early 2009 and the summer of 2010 alone.[124] Indeed, personal relations between senior Russian and US officials contributed to the success of the reset. Applauding its results in June 2010, White House staffer Ben Rhodes suggested "that the President believes that that's in large part due to the positive relationship that he's forged with President Medvedev."[125] The Russian president, in turn, was generous in praising his US counterpart, characterizing Obama as a "strong politician" who "knows how to listen and respond to arguments."[126] Other US and Russian officials argued that personal connections between senior counterparts contributed to successful cooperation on Iran and New START.

Russia's Reception of the Reset

Medvedev was viewed as an "enthusiastic partner" in the reset.[127] In his September 2009 conversation with Zakaria, Medvedev commented extensively on the change, saying that "we are enjoying truly positive relations with the new administration" and that "we speak the same

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122 White House, Office of the Press Secretary, "Press Briefing by National Security Advisor to the Vice President Tony Blinken on the Vice President's Upcoming Trip to Ukraine and Georgia," July 17, 2009, https://www.presidency.ucsb.edu/documents/press-briefing-national-security-advisor-the-vice-president-tony-blinken-the-vice.

123 Gibbs-Rhodes-McFaul press briefing.

124 White House, Office of the Press Secretary, "Conference Call Briefing with Administration Officials on President Medvedev's Visit to the White House," June 22, 2010, https://www.presidency.ucsb.edu/documents/conference-call-briefing-with-administration-officials-president-medvedevs-visit-the-white.

125 Conference Call Briefing on President Medvedev's Visit to the White House.

126 "Itogi goda s Prezidentom Rossii" [(The Kremlin) Annual Review With the Russian President], December 24, 2009, http://kremlin.ru/events/president/news/6450.

127 McFaul interview.

language [, which] was not the case with the previous administration during its last years."[128]

There were occasional Russian frustrations with the United States, for instance, with Biden's comment in July 2009 that Russia's economy was "withering" and that this trend would force the country to make accommodations to the West.[129] Nevertheless, the overarching Russian perception was that of improving relations with Washington. At the 6th Valdai annual meeting in September 2009, Karaganov argued that, while the "reset," as originally conceived, had proven an "insufficiently effective instrument" since other issues had pushed a Russian-US rapprochement into the background, the relationship was still on an upward trajectory.[130]

The Russian leadership hoped the reset would help it to realize the country's domestic and foreign policy priorities. Russia had been badly hit by recession in 2008, which ended an era of unprecedented growth—an annual average of 7 percent between 1999 and 2007.[131] In 2009, Russia's gross domestic product fell by 9 percent and the government spent considerable reserves to bail out domestic businesses. Discussing the implications of economic crisis at a 2009 Valdai Discussion Club meeting, Putin explained that the government needed to ensure the availability of long-term loans to Russian businesses, strengthen the financial system, and diversify the economy.[132]

Medvedev laid out his vision for economic modernization in a number of speeches and articles, most notably his September 2009 piece, "Go Russia!" In that article, he pointed to Russia's "primitive economy based on raw materials and endemic corruption" and asked, "[I]f Russia cannot relieve itself from these burdens, can it really find its own path for the

128 Medvedev CNN interview.
129 Peter Spiegel, "Biden Says Weakened Russia Will Bend To U.S.," *Wall Street Journal,* July 25, 2009, https://www.wsj.com/articles/SB124848246032580581.
130 "Vzglyad s Vostoka: Zavershilas' 'yakutskaya' chast' zasedaniya Valdaiskogo kluba" [A Perspective From The East: The Yakutsk Part of the Valdai Club Session Has Ended], *Rossiiskaya Gazeta,* September 11, 2009, https://rg.ru/2009/09/11/karaganov.html.
131 Tsygankov, *Russia's Foreign Policy,* p. 209.
132 "Vladimir Putin at the sixth Valdai Discussion Club," September 11, 2009, http://archive.premier.gov.ru/eng/events/news/4990/.

future?"[133] Medvedev stressed the importance of attracting investment in the information technology sector and intensifying efforts toward Russia's WTO accession, for which US support was considered vital. In his July 2010 meeting with Russian ambassadors, he also called for "modernization alliances" with the United States and other Western countries.[134] At the same time, the Kremlin hoped for progress with the United States on arms control, welcoming early indications that the Obama administration would reconsider its plans for deployment of missile defense in Europe because of its cost and doubts about its effectiveness. The Russian government also applauded the resumption of high-level formal ties in the NATO-Russia Council, which had been suspended after the August 2008 Russia-Georgia war, and sought renewed engagement on a European security treaty.[135]

Medvedev's modernization effort was supported by Prime Minister Putin, who held that "our main objective in the development strategy of the country is to diversify the economy and to enhance labour productivity and investment in so-called 'human capital'."[136] At the same time, that effort did not undermine a consensus among the foreign policy elite that the government should defend Russian status and national interests abroad and engage the West but also pragmatically exploit opportunities and build flexible coalitions elsewhere.[137]

Looking for Evidence of Linkage Diplomacy: European Missile Defense

From Scrapping Bush's Missile Defense Plan to the Phased Adaptive Approach in Europe

When the Obama administration assumed office in January 2009, it hinted that it was no longer rushing forward with earlier US plans to deploy strategic missile defense in Poland and the Czech Republic and was instead

133 Dmitry Medvedev, "Go Russia!," September 10, 2009, http://en.kremlin.ru/events/president/news/5413.
134 Denis Dyomkin, "Kremlin Seeks Investment Alliances With US, EU," *Reuters,* July 12, 2010, http://www.reuters.com/article/us-russia-medvedev-alliance-idUSTRE66B27V20100712.
135 Dmitry Medvedev, "Speech at Helsinki University and Answers to Questions from Audience," April 20, 2009, http://en.kremlin.ru/events/president/transcripts/3805.
136 "Vladimir Putin at the sixth Valdai Discussion Club."
137 Tsygankov, *Russia's Foreign Policy.*

reviewing the cost and effectiveness of that approach.[138] While Biden noted that the United States would continue to counter Iran by developing missile defenses, he said it would do so in consultation with NATO allies and Russia.[139] Rumors about prospective linkage between US policy on missile defense and the Russian government's stance on the Iran nuclear issue first emerged in March when the US press wrote about a letter Obama had sent to Medvedev.[140] In the letter, Obama reportedly offered to reconsider US missile defense plans in return for Moscow working with Washington to contain Iran's nuclear ambitions. Medvedev denied there was a deal, explaining that his correspondence with Obama had contained suggestions and assessments rather than specific proposals and mutually binding initiatives.[141]

Nevertheless, the Americans' consistent argument that any missile defense for Europe was aimed not at Russia but at an Iranian missile threat generated a Russian expectation that jointly removing that perceived threat would make US missile defense obsolete.[142] The Kremlin's position on US missile defense for Europe was that it "would damage the current system of checks and balances" and "complicate the prospects for nuclear disarmament."[143] Moscow was also adamant that future readiness to reduce its strategic *offensive* arsenal

138 The Bush administration's original missile defense plan, adopted in 2007, called for a "third site" in Europe and claimed to offer "improved protection against ICBM threats emanating from the Middle East while also providing some protection of Europe against medium and intermediate-range ballistic missiles." US Department of Defense, "Ballistic Missile Defense Review Report," February 2010, http://archive.defense.gov/bmdr/docs/BMDR%20as%20of%2026JAN10%200630_for%20web.pdf.

139 Biden Munich remarks.

140 Peter Baker, "Obama Offered Deal To Russia In Secret Letter," *New York Times,* March 2, 2009, http://www.nytimes.com/2009/03/03/washington/03prexy.html.

141 Pyotr Iskenderov, "Medvedev and Obama Admit to Correspondence but Not to a Deal on Iran," *Vremya Novostei,* March 4, 2009, p. 5, in *Current Digest of the Russian Press,* Vol. 61, No. 8, p. 22. The notion Obama offered a quid pro quo was denied by the White House too: White House, Office of the Press Secretary, "Press Briefing by Press Secretary Robert Gibbs," March 3, 2009, https://www.presidency.ucsb.edu/documents/press-briefing-press-secretary-robert-gibbs-191.

142 Obama himself said in his Prague speech on April 5, 2009 that "[i]f the Iranian threat is eliminated, we will have a stronger basis for security, and the driving force for missile defense construction in Europe will be removed." White House, Office of the Press Secretary, "Remarks By President Barack Obama In Prague As Delivered," April 5, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-prague-delivered.

143 Medvedev, "Speech at Helsinki University."

was inextricably linked to the US strategic *defensive* posture. It threatened to deploy tactical missiles in Kaliningrad if an accommodation over US missile defense proved impossible to reach.[144]

On September 17, 2009, a week before the revelation of Iran's Fordow site, the Obama administration announced that it had decided to abandon its original "third site" plan for Europe, instead looking to develop a more economical and high-tech system.[145] Russian officials welcomed the announcement; Medvedev called it a "positive signal" while reiterating there would not be "primitive compromises or trade-offs" in return.[146] Konstantin Kosachev, head of the Duma's Foreign Relations Committee, said the Obama administration had shown a better understanding of Russia's concerns than its predecessor, while another official applauded Russia's own uncompromising position on missile defense as having driven Obama's decision.[147]

Later in 2009, however, when the United States proceeded with the development of an alternative scheme, Moscow repeatedly asked for clarifications. What became known as the European Phased Adaptive Approach (EPAA) envisioned enhancing US capabilities in four phases, deploying new SM-3 interceptors to Poland by 2018, and providing consistent upgrades to missile defense command-and-control systems.[148] When in February 2010 the United States announced its intention to deploy interceptor missiles in Romania, Russian officials reacted negatively. Lavrov demanded an "exhaustive explanation" from Washington and Deputy Prime

144 The Russian government reacted to early US statements on the missile defense review by freezing a plan announced earlier to deploy Iskander missiles to Kalinigrad but later raised the prospect of such a deployment again. "Medvedev: Russia May Still Reply to U.S. Shield with Baltic Missiles," *Sputnik,* July 10, 2009.

145 Peter Baker, "White House Scraps Bush's Approach To Missile Shield," *New York Times,* September 17, 2009, http://www.nytimes.com/2009/09/18/world/europe/18shield.html.

146 Sergey Strokan, "Russia Will Simply Pocket This Concession," *Kommersant,* September 21, 2009, p. 8, in *Current Digest of the Russian Press,* Vol. 61, No. 37, pp. 7-9.

147 Moritz Gathmann, "Euphoria Over Obama's Decision to Shelve Missile Shield," *Der Spiegel,* September 17, 2009, http://www.spiegel.de/international/world/sense-of-triumph-in-moscow-euphoria-over-obama-s-decision-to-shelve-missile-shield-a-649732.html.

148 For details on the European Phased Adaptive Approach (EPAA), see US Department of Defense, "Ballistic Missile Defense Review Report."

Minister Sergey Ivanov warned of disruptions to the New START talks.[149] Meanwhile, the Pentagon maintained that the EPAA posed no threat to Russia and even opened up the prospect "for a Russian contribution, if political circumstances make that possible."[150]

The US agenda on European missile defense was in flux in 2009 and 2010. Therefore, any investigation of linkage diplomacy has to be mindful of an important distinction: Did Russia become more cooperative on the Iran nuclear dossier in response to the Obama administration's September 2009 abandonment of Bush-era missile defense? Or did Moscow use its leverage in the P5+1 negotiations in 2010 to get the United States to abandon or modify the EPAA, thus linking the Iran and missile defense dossiers at a later stage? While these two forms of linkage—possibly exercised by Russia between the Iran dossier and other arms control concerns—are not mutually exclusive, it is important to analytically distinguish between them.

Parsing the Evidence: Linkage Diplomacy after Obama's September Announcement

Russian and US officials publicly rejected the notion that Obama's September 17 announcement to scrap the Bush administration's missile defense plans was linked to other issues in the US-Russian relationship. Russia argued that Obama's decision corrected an earlier, flawed US policy and therefore should not be construed as a "concession" to Russia, for which Moscow needed to return a favor.[151] US officials were equally adamant that their policy review was pragmatically driven by updated assessments of the Iranian missile threat and the availability of better technology to counter it, rather than by Russia's position.[152] Even before the September

149 Andrew Osborn, "Russia Condemns US Move to Put Missiles in Romania," *Telegraph,* February 7, 2010, http://www.telegraph.co.uk/news/worldnews/europe/russia/7182258/Russia-condemns-US-move-to-put-missiles-in-Romania.html.
150 US Department of Defense, "Ballistic Missile Defense Review Report."
151 See statements by Fyodor Lukyanov and Oksana Antonenko in "Quid Pro Quo?," *Sputnik,* September 17, 2009.
152 Robert M. Gates, "A Better Missile Defense For A Safer Europe," *New York Times,* September 19, 2009, http://www.nytimes.com/2009/09/20/opinion/20gates.html.

announcement, US officials repeatedly stated that the future of missile defense would not be open to "bargaining."[153]

The sequence of events in September also fails to conclusively show that the Russian government became more cooperative on Iran in response to what was perceived as a US concession on missile defense. Medvedev's harshest remarks vis-à-vis Iran came on September 25, after both Obama's announcement on missile defense and the Fordow revelation. Yet his statement at the Valdai Discussion Club on September 15, which predated both events, had already signaled that Russia was amenable to cooperation in a multilateral sanctions effort. In other words, it did not take the US missile defense review for the Kremlin to concede that "sanctions are not very effective, but sometimes we are forced to impose them."[154]

While there was arguably a shift in tone between Medvedev's September 15 and September 25 remarks, this nuance does not in itself indicate a qualitative change in Russia's stance as a result of the US missile defense announcement. In the absence of more concrete evidence, it cannot be conclusively established what causal weight Obama's missile defense announcement, the Fordow revelation, or the rejection of the TRR proposal played in driving Russia's policy on the Iran nuclear issue. The evidence examined, however, suggests that concerns related to Iran were the main reason for the Medvedev government's readiness to cooperate, while the Obama administration's gesture on missile defense constituted an additional boost.

Russia scholar Thomas Graham also doubted that there was a direct trade between the Iran and missile defense files, but introduced the notion of "atmospheric linkage," or what I refer to as diffuse reciprocity, following Keohane. Graham said in a September 2009 interview with *Sputnik* that the United States was "not looking for a concession from Russia, in part because it [did] not believe its decision was a concession to Russia," but hoped "its decision will further improve the atmosphere" in bilateral relations. This improvement, in turn, would incline Moscow to "deal with common threats, in particular the Iranian nuclear weapons program."[155]

153 McDonough- Froman-Gavin-McFaul press briefing.
154 "Iran's Proposals on Global Issues Require Analysis–Medvedev," *Sputnik,* September 15, 2009.
155 "Missile Shield Decision Clears Tension in Russia-US Relations," *Sputnik,* September 18, 2009.

Obama himself confirmed his expectation of atmospheric linkage, justifying his decision on missile defense in a CBS interview by saying that "if the by-product of it is that the Russians feel a little less paranoid and are now willing to work more effectively with us to deal with threats like ballistic missiles from Iran or nuclear development in Iran, then that's a bonus."[156]

US sources confirmed that the decision on missile defense, while not primarily intended to elicit Russian cooperation on Iran, was still perceived to have "changed the climate" with Russia,[157] saying it was "part of the rationale"[158] and that "we certainly did not think it would hurt cooperation with Russia."[159] Such optimism was echoed by the Russian government. Medvedev stated on September 22 that US willingness to abandon its original missile defense plans created a "good opportunity" to exchange views with Obama on all questions of strategic stability.[160]

This aura of atmospheric linkage also generated hope for cooperation on joint missile defense. Once the Obama administration dropped the Bush-era scheme, officials on both sides believed the time was ripe for cooperation on the historically sensitive issue. Already in June 2009, US Secretary of Defense Robert Gates suggested that prospects for a US-Russian partnership on a missile defense system had improved. In that context, Moscow and Washington began to discuss proposals involving the possibility of siting a radar or data exchange centers on Russian territory.[161] Usually hawkish on prospects for cooperation, the Russian military supported joint missile defense, stating that any system the US government was thinking about would be "viewed negatively unless we are to build

156 "Obama: Moscow Move 'Bonus' Of Missile Plan," CBS News, September 20, 2009, https://www.cbsnews.com/news/obama-moscow-move-bonus-of-missile-plan/.
157 Samore-Wolff-McFaul press briefing; author interviews with US officials.
158 Dennis Ross, former special assistant to the president and senior director for the Central Region, Skype interview with author, July 25, 2016.
159 Former senior White House official, telephone interview with author, August 1, 2016.
160 "Zayavlenie Dmitriia Medvedeva v svyazi s korrektirovkoi podkhodov SShA po voprosu o PRO" [(Russian President) Dmitry Medvedev's Announcement in Relation to the Correction in US Approaches to Missile Defense], September 17, 2009, http://kremlin.ru/events/president/news/5496.
161 Vladimir Solovyov, "US Missile Defence Sets Its Sights On Russia," *Kommersant,* June 11, 2009, p. 1, in *Current Digest of the Russian Press,* Vol. 61, No. 23, pp. 17-18.

it jointly."[162] Dmitry Rogozin, then Russia's permanent representative to NATO, laid out his case for joint missile defense in an October article in *Jane's Defence Weekly*.[163]

The US-Russia Arms Control and International Security Working Group, established under the auspices of the Bilateral Presidential Commission, was then made responsible for exploring missile defense cooperation.[164] In addition, track-two efforts kicked off in December 2009 with the launch of the Euro-Atlantic Security Initiative (EASI) on cooperative missile defense. Co-chaired by Wolfgang Ischinger, the Munich Security Conference chair and former German ambassador to the United States; former Russian Foreign Minister Igor Ivanov; and former US Senator Sam Nunn, and involving other senior officials, EASI was considered a promising initiative in US and Russian expert circles. This serves as further evidence of the shared hope for diffuse reciprocity during the reset.

Parsing the Evidence: Linkage Diplomacy in Negotiations on Resolution 1929

What about evidence of linkage diplomacy in early 2010, once negotiations toward Resolution 1929 were underway and Russia grew more concerned about the EPAA? US and Russian officials involved in Iran talks could not confirm any direct linkage to missile defense: "I never heard of a conversation in which we told the Russians: We will do something on missile defense if you do something on Iran," one former US official said.[165] While Russian diplomats frequently reiterated that by helping to resolve the dispute over Iran's nuclear weapon program, they expected European missile defense to become obsolete, such argumentation was not used as leverage in negotiating the specifics of Resolution 1929.

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162 "Russia Insists on Involvement in Any International Missile Shield," *Sputnik,* September 21, 2009.

163 "Stat'ya D. O. Rogozina «Jane's Defence Weekly»" [D. O. Rogozin's Article in *Jane's Defence Weekly*], October 26, 2009, http://www.mid.ru/web/guest/maps/us/-/asset_publisher/unVXBbj4Z6e8/content/id/276186.

164 Established in July 2009 by Obama and Medvedev, the Bilateral Presidential Commission was a regular and structured mechanism to advance US-Russian dialogue on priority bilateral objectives, made up of coordinators, working groups and sub-committees.

165 Nephew interview.

That said, haggling over the resolution's language on Iran's ballistic missile threat was directly affected by the specter of US missile defense. The final text was ambiguous on existing Iranian missile capabilities, establishing restrictions according to which "Iran shall not undertake any activity related to ballistic missiles capable of delivering nuclear weapons, including launches using ballistic missile technology, and States shall take all necessary measures to prevent the transfer of technology or technical assistance to Iran related to such activities."[166] According to one US source, this "muddied language" was a result of Russia's sensitivity to the provision, since including it in a UN resolution meant giving credence to a purported Iranian ballistic missile threat, which in turn legitimized the need for US missile defense against Iran. Russia agreed to language United States viewed as "not so great" only after being engaged bilaterally on the issue.[167]

Looking for Evidence of Linkage Diplomacy: New START

As with missile defense, the talks on New START remained insulated from the negotiations on Resolution 1929 and there was no direct linkage. But again, the evidence suggests that the arms control negotiations supported the general aura of diffuse reciprocity in Russian-US relations and were a contextual driver of Russian cooperation on Iran.

The Obama administration came into office in January 2009 with the stated intention to negotiate an agreement to replace START I, which was due to expire by the end of the year. Lead negotiators Rose Gottemoeller and Anatoly Antonov had their first meeting on the issue in April in Rome.[168] Sergey Ryabkov, Russia's deputy foreign minister, struck an optimistic tone two days before that meeting, noting encouraging signs that the new US administration, unlike its predecessor "will take Russian priorities and preferences into account."[169]

At the outset of negotiations, Russia's objectives consisted in reducing the number of strategic delivery vehicles severalfold compared with START I and

166 Point 9 of Resolution 1929.

167 Former US official serving at the US mission to the United Nations.

168 Boris Yunanov, "Three Flocks of Hawks," *Vremya Novostei,* April 24, 2009, p. 5, in *Current Digest of the Russian Press,* Vol. 61, No. 16, pp. 4-6.

169 Ryabkov interview on disarmament.

cutting the number of warheads below the level established by the Moscow Treaty of 2002. The Russian government also sought to reach agreement on limitations for the US arsenal of precision-guided strategic weapons and preserve the provisions of START relating to the deployment of strategic offensive weapons solely on national territory. Finally, in what would become the major sticking point, Russia linked any willingness to reduce strategic offensive arsenals to US activities on missile defense.[170] To establish a link between strategic offensive and strategic defensive weapons was, according to a Russian arms control expert, "a principal thing for Russia."[171] Since the United States consistently resisted that linkage, Moscow resolved in September 2009 that New START was not to result in the kinds of reductions in its strategic offensive arsenal that would in any way be endangered by limited US missile defenses, and negotiations were allowed to continue.[172]

New START and Russian Cooperation on Iran: No Evidence of Direct Linkage

Since the negotiations toward New START proceeded in parallel with the P5+1 talks on Iran that led to Resolution 1929, and since agreeing on reductions to US and Russian strategic offensive arsenals was a high priority for the Obama administration, it would seem intuitive that some level of linkage connected the two sets of negotiations, each player using leverage on one issue to extract concessions on the other. However, to the United States, Iran represented a "limited missile threat that had to be met with limited missile defense," which, from Washington's point of view, was unrelated to the need for the United States and Russia to limit their strategic offensive arsenals. As a result, Washington wanted no mention of Iran or missile defense at the New START talks in Geneva.[173]

According to Gottemoeller, once the EPAA was proposed, "a completely separate team came out from DC to Geneva to brief on the new plan. I sat in,

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170 Aleksandr Gabuev and Ivan Konovalov, "Dmitry Medvedev Moves To Bypass US Missile Defence," *Kommersant,* June 22, 2009, p. 6, in *Current Digest of the Russian Press,* Vol. 61, No. 25, pp. 13-14.

171 Russian senior arms control expert, interview with author, Moscow, April 21, 2016.

172 Rose Gottemoeller, former assistant secretary of state for verification, compliance, and implementation, interview with author, Washington, DC, June 27, 2016 (hereafter cited as "Gottemoeller interview").

173 Gottemoeller interview.

but none of the rest of my team were allowed, because we were trying to keep a strict demarcation between offense and defense."[174] Richard Nephew, who participated in the negotiations on Resolution 1929 for the US delegation, also confirmed that New START did not feature in his discussions with Russian counterparts on Iran sanctions and that the teams responsible for the respective talks were separate. The Russian side was equally vehement in rejecting any notion of linkage between these issues: "Did we agree to Resolution 1929 because we expected some favor [*blagosklonnost*] from the US on other issues? Absolutely not."[175]

Diffuse Reciprocity Surrounding New START

While the Russian leadership did not make its support for Resolution 1929 conditional upon explicit concessions related to New START, there was again atmospheric linkage at play between the two issues. A joint ability to work together on Iran "created an atmosphere which made it in some respects easier to settle differences over New START, but it was an atmospheric contribution, rather than some trade-off."[176] The notion of diffuse reciprocity was also supported by the sequence of events. When US and Russian officials convened in Prague in early April 2010 to celebrate the signing of New START, small groups leveraged the positive atmosphere to discuss Iran during sidebar meetings. In Prague, Obama also announced that the United States was prepared to lift Iran-related sanctions on three Russian companies, as well as resubmit the 123 agreement to Congress for approval. Incidentally, on the same day, the White House confirmed that negotiations on Iran sanctions had formally moved to the UN Security Council.

These data points suggest that New START had generated positive momentum that spilled over into the Iran agenda. Amid the euphoria over having concluded a new arms control treaty, the United States signaled its willingness to engage in friendly gestures vis-à-vis Russia on other bilateral issues, which it argued would reduce the perceived cost for Russia of supporting sanctions against Iran. Ryabkov equally applauded the treaty

174 Gottemoeller interview.
175 Interview with Russian Foreign Ministry official.
176 Burns interview.

as a useful springboard for advancing many issues on the international disarmament and nonproliferation agenda.[177]

The Narrow Trades on Resolution 1929

While linkages between missile defense, New START, and the Iran file were mainly atmospheric, more explicit linkage was at play regarding Russia's objectives of WTO accession and obtaining congressional approval of the 123 agreement on the one hand and cooperation on the Iran dossier on the other. In 2009 and 2010, Moscow remained interested in cooperation on peaceful nuclear energy with the United States and hoped for congressional approval of the bilateral civil nuclear cooperation agreement, which allowed US companies to share nuclear technology and materials with foreign counterparts, carry out joint R&D activities, and partner more easily with Russian firms in joint nuclear ventures.[178] Congressional approval of the 123 agreement with Russia had languished since being put on hold after the 2008 Russia-Georgia conflict. Obama resubmitted the text to Congress in May 2010, just before the Security Council vote on Resolution 1929. Moscow was also hopeful that the Obama administration would step up its efforts to support Russia's accession to the WTO—something that Moscow had sought for 15 years and for which US endorsement was considered critical.

Importantly, rather than Russian officials explicitly raising their hopes for US support for WTO accession or 123 agreement congressional approval with US counterparts in the P5+1, US officials themselves proactively engaged in anticipatory linkage, signaling that US support was more likely in the event of Russian cooperation on Iran: "The Russians were trying to get support on WTO accession, the 123 nuclear cooperation agreement, and we weren't shy. We never made it explicitly transactional, we never said 'You will give us an arms embargo as part of 1929 and we will give you the 123 agreement.'

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177 "Interv'yu S. A. Ryabkova po rabote nad Dogovorom o SNV i perspektivakh ego ratifikatsii" [S. A. Ryabkov's Interview on the Work on the New START Treaty and the Prospects of its Ratification], April 11, 2010, http://www.mid.ru/web/guest/voenno-strategiceskie-problemy/-/asset_publisher/hpkjeev1aY0p/content/id/255398.

178 US Department of State, Office of the Spokesman, "The Agreement Between the Government of the United States of America and the Government of the Russian Federation for Cooperation in the Field of Peaceful Uses of Nuclear Energy," January 12, 2011, https://2009-2017.state.gov/r/pa/prs/ps/2011/01/154318.htm.

We never said that, and we would not do that, but we said it would be easier to get congressional support if you, Russia, are seen as being positive and effective and helpful on Iran."[179]

Recalling how Obama raised prospective US support for Russia's WTO bid, approval of the 123 agreement, and sanctions relief for Russian companies with Medvedev in Prague in April 2010, McFaul similarly characterized these gestures as part of a broader approach. This approach, McFaul said, signaled to Russia that "we want to make our relationship more valuable to you economically and politically than your relationship is with Iran." When asked if Russian officials themselves had explicitly asked for such quid pro quos, he replied, "It was our strategy to be very proactive in making suggestions, as opposed to waiting for them." However, McFaul was adamant that this strategy did not endorse trades on unrelated issues—for instance, Russian support on Iran for a shifting US position on Georgia: "We considered [linkage] to be legitimate only within the parameters of nuclear cooperation. Lifting restrictions on companies that had been sanctioned because of Iran seemed like a legitimate thing to trade. And on the 123 agreement, we made an explicit argument that Rosatom had business dealings in Iran, and we wanted to create business dealings [for it] with American companies."[180]

Conclusion

In sum, while there is limited evidence of direct linkage diplomacy between the Russian and US governments over Moscow's support for Resolution 1929, interviewees' testimonies overwhelmingly point to a notion of diffuse reciprocity pervading the Iran talks.[181] US officials tried to secure Russia's cooperation by promising it a more beneficial bilateral relationship overall. To that end, they rhetorically placed cooperation on the Iran issue into the larger context of the reset, from which Russia stood to gain. In that sense, although Russia's principled readiness to cooperate on Iran was driven by frustration over Tehran's intransigence, fears of regional military escalation, the desire to protect the United Nations as the chief venue for any sanctions effort,

[179] Nephew interview.
[180] McFaul interview.
[181] The sparse evidence of linkage diplomacy does not constitute conclusive proof that linkage did not, in fact, occur more frequently.

concerns about nuclear proliferation in the Middle East, and an ability to shield Russia's economic and political interests with Iran in the context of the negotiations on Resolution 1929, an expectation of diffuse reciprocity was an important contextual factor enabling Russian cooperation.

US official rhetoric and signaling led Russian diplomats to believe that the more areas both sides worked on constructively, the better the overall relationship would be, which would then help to achieve understanding on other issues. John Beyrle, the US ambassador to Russia during the period covered in this chapter, described the essence of what Keohane captures with the notion of diffuse reciprocity, saying in a 2016 interview that there was a "building up of credits on one side, which engendered some giving on the other side."[182] In this context, hopes that cooperation on Iran would elicit US reciprocity in the reset were an additional driver of Russian policy but not its principal cause. Linkage was mostly conceived through the notion of diffuse reciprocity, rather than trades, bargains, or quid pro quos.

Interestingly, Russian and US officials both vehemently denied the pursuit of linkage beyond the parameters of the nuclear proliferation agenda. US sources professed that they "never made the relationship explicitly transactional,"[183] "would have resisted linkage, had Russia engaged in it,"[184] and pursued a policy of "no linkage" during the reset.[185] The Russian position echoed this sentiment: "There was no linkage from our side ever on the Iran issue."[186] Indeed, there was a sense on both sides that "linking things" was no way to conduct serious diplomacy, that the relationship should not be managed in those terms—one should not engage in "bizarre transactions,"[187] or "just trade one thing for another."[188] US interviewees also betrayed a sense that, in a relationship in which diffuse reciprocity was at play, there was no need for Russia to pursue quid pro quos, since it was going to benefit from improving relations over time in any case. On the other hand, since Russian

182 Beyrle interview.
183 Nephew interview.
184 Former White House official, Skype interview with the author, July 25, 2016.
185 McFaul interview.
186 Russian Foreign Ministry official.
187 McFaul interview.
188 BBC News, "Dmitry Medvedev interview [with Andrew Marr]," March 29, 2009, http://news.bbc.co.uk/1/hi/programmes/andrew_marr_show/7972129.stm.

officials cast their position on Iran as historically consistent and in support of existing UN resolutions, they also rejected the notion of expecting reciprocity in return for cooperation as a matter of principle.

Parsing the substantial body of written and oral evidence on the negotiations on Resolution 1929, it has been impossible to establish an irrefutable cause-and-effect relationship between Russian cooperation on Iran and diffuse reciprocity. Did the former propel the latter, or vice versa, or rather, were the two mutually reinforcing? Judging from statements of US officials with long experience of negotiating Iran sanctions with Russian officials, the context of the reset was a positive contextual, rather than necessary, condition for arriving at Resolution 1929. On the other hand, the explanatory weight Russian sources attributed to Middle East-related concerns versus the reset in explaining Russian cooperation varied depending upon their institutional and ideological standpoints. One prominent liberal Russian intellectual thought that sanctioning Iran was hardly more than "pocket change"[189] used by Russia to achieve aims in the reset, insinuating that the Iran nuclear dossier was of secondary importance to Russia compared to other issues on the US-Russian bilateral agenda. Russian arms control experts, on the other hand, argued that Russia's support for Resolution 1929 was driven by Moscow's nonproliferation concerns and that the reset provided nothing more than a contextual boost to such support.

This inconsistency in views notwithstanding, the reset was ultimately important not only because it pursued a qualitatively new relationship with Russia, but also because it was embedded in a broader US strategy, which sought sincere engagement with Tehran and was, therefore, welcomed by Moscow. An intransigent Ahmadinejad regime collided with a US administration that had put Moscow at the center of its engagement with Iran. This state of play engendered a growing belief on the Russian side that increased pressure on Tehran was needed. To the extent, then, that the reset was inextricably linked to a new US approach toward Iran, it was key to eliciting Russian cooperation.

[189] Trenin interview.

CHAPTER THREE

Moving beyond Self-Restraint: Bilateral Commercial Nuclear Supply and US-Russian Tacit Understanding on Nuclear Security and International Safeguards

Adam N. Stulberg and Jonathan Darsey

Recent tectonic shifts in the global commercial nuclear landscape appear to confound efforts at strengthening international nuclear safeguards. With cheaper natural gas, the declining cost of renewables, and little domestic demand for new nuclear power, US companies have lost their dominance in the global nuclear industry and face strong headwinds, just as Russia's commercial nuclear sector is emerging as the leading global player. With the strong backing of the Russian government, state-owned nuclear company Rosatom can offer customers concessionary financing and integrated "design-build-operate" packages that are leading to Russian-controlled international nuclear power projects that are "large (in total amount provided), cheap (with low interest rates) and long-lived (with long repayment periods)."[1] These diverging trajectories for the US and Russian commercial nuclear industries threaten to unleash a "race to the bottom," where competitive and strategic pressures erode profits as well as the norms of nuclear security, notwithstanding the historical legacy of US-Soviet/Russian cooperation and mutual interests in shoring up international safeguards against nuclear weapon proliferation.

[1] Jane Nakano, *The Changing Geopolitics of Nuclear Energy* (Washington, DC: Center for Strategic and International Studies, 2020), p. 13, https://www.csis.org/analysis/changing-geopolitics-nuclear-energy-look-united-states-russia-and-china; and David K. Gattie and Joshua N.K. Massey. "Twenty-First-Century US Nuclear Power: A National Security Imperative," *Strategic Studies Quarterly,* Vol. 14, No. 3 (Fall 2020), pp. 121-42, https://www.jstor.org/stable/26937414.

This conception of a downward spiral of commercial and strategic competition is accepted today as conventional wisdom in both Washington and Moscow. There is near consensus among US policy experts that the faltering stature of US suppliers opens the door for Moscow to use its strong nuclear power industry as a tool of energy diplomacy, spreading lax nuclear security and nonproliferation standards in its wake. The current predicament arguably presents a "vicious circle" between eroding US commercial nuclear competitiveness, rising Russian neo-mercantilist influence over nuclear energy states, and weakening global nuclear security and nonproliferation norms.[2] Accordingly, there are widespread calls for the US government to realign commercial and national security objectives by offering extra-market incentives to level the global commercial playing field and arrest the decline of US nuclear companies while at the same time insisting on stronger safeguards against proliferation—such as prohibiting the sale of nuclear technology to any country that has not ratified the International Atomic Energy Agency (IAEA) Additional Protocol (AP) to existing safeguards agreements.[3] By the same token, intense political acrimony between Russia and the United States stokes strategic distrust and muddles Moscow's posture on enhancing international safeguards. For example, the Kremlin's hesitancy to endorse the IAEA's state-level concept for safeguards, which allows the agency to consider a wide range of information about a state's nuclear activities and tailor its inspections accordingly,[4] is rooted in Russia's rejection

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[2] Christopher Ashley Ford, "A New Approach to Civil Nuclear Cooperation Policy" (remarks at the Hudson Institute, Washington, DC, February 26, 2019), https://2017-2021.state.gov/a-new-approach-to-civil-nuclear-cooperation-policy/index.html.

[3] Richard Nephew, *Reconsidering US Nuclear Cooperation Agreements* (New York: Columbia/SIPA Center on Global Energy Policy, March 2020), https://www.energypolicy.columbia.edu/sites/default/files/file-uploads/NucCoopAgreements_CGEP-Report_032420.pdf; Energy Futures Initiative (EFI), *The U.S. Nuclear Energy Enterprise: A Key National Security Enabler* (Washington, DC: EFI, August 2017), https://energyfuturesinitiative.org/s/EFI-nuclear-paper-17-Aug-2017.pdf; US Department of Energy (DOE), *Restoring America's Competitive Nuclear Advantage: A Strategy to Assure U.S. National Security* (Washington, DC, DOE, 2020), https://www.energy.gov/strategy-restore-american-nuclear-energy-leadership; Nakano, *Changing Geopolitics;* and Gattie and Massey, "Twenty-First-Century US Nuclear Power."

[4] David Trimble, Josey Ballenger, and Glen Levis, "IAEA's Implementation of the State-Level Concept" (Washington, DC: US Government Accountability Office, 2014), https://www.iaea.org/sites/default/files/19/03/cn-220-paper-000235.pdf.

of what it describes as the "politicization" of the AP's implementation so as to favor otherwise ebbing Western influence; enshrine subjective, unfair, and unnecessary practices; and discriminate against Moscow's commercially competitive nuclear exports.[5]

The perverse implications of this commercial and political rancor are particularly conspicuous in the emerging market of "nuclear newcomers," states that are considering the addition of nuclear power to their energy mix. This has fueled debate over the issue of whether Washington should require that nuclear newcomers that wish to conduct business with US companies sign the AP; this requirement, some argue, risks stymieing US nuclear deal-making and entrenching Moscow's resistance to mandating the AP. It also muddies the waters and creates incentives for nuclear newcomers such as Saudi Arabia to work with rival exporters such as China. This would challenge both US and Russian commercial and national security interests, as China's initial forays into nuclear exports demonstrate that it is willing to sign opaque cooperation arrangements with emerging nuclear states that allow the transfer of nuclear technology with few nonproliferation restrictions.

Is this gloom-and-doom assessment fully warranted? Can the United States and Russia find common ground today to strengthen international safeguards in their nuclear cooperation agreements with other countries amid opposing commercial nuclear fortunes and vitriolic political relations? We argue here that there is room for optimism. Heated strategic rivalry during the Cold War did not prevent diplomatic coordination and constructive bilateral

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[5] Corey Hinderstein and Anton Khlopkov, eds., *The Future of IAEA Safeguards: Rebuilding the Vienna Spirit through Russian-U.S. Expert Dialog,* Nuclear Threat Initiative and the Center for Energy and Security Studies, November 2020, https://media.nti.org/documents/The_Future_of_IAEA_Safeguards_final.pdf; Ministry of Foreign Affairs of the Russian Federation, "Statement by the representative of the Russian Federation at the Third Session of the Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons on the Issues of Nuclear Disarmament (Cluster 1)," (New York: Russian Foreign Ministry, May 3, 2019), https://www.mid.ru/en/foreign_policy/rso/-/asset_publisher/0vP3hQoCPRg5/content/id/3631627; and Nikolai Sokov, "IAEA safeguards: patterns of interaction and their applicability beyond the Cold War," in William C. Potter and Sarah Bidgood, eds., *Once and Future Partners: The United States, Russia and Nuclear Non-proliferation* (London: International Institute for Strategic Studies, 2018), pp. 184-185.

engagement on key issues of nonproliferation, especially with respect to bolstering the international nuclear safeguards regime.[6] Yet, as Nikolai Sokov details, mutual security interests alone were never sufficient to cement a high degree of US-Russian cooperation on international safeguards. The two states had to muster considerable political will to manage differences over implementation, as well as to transcend alliance concerns and distinct national decision-making processes that weighed against the realization of shared strategic objectives.[7] Today, although mutual recriminations tend to drown out evidence of commonality, there is nonetheless considerable convergence in US and Russian commitments to reducing nuclear risks in their international commercial deals. Through self-restraint—forgoing opportunities to capture narrow commercial advantages by exploiting ambiguity in the implementation of prevailing international standards—and through their pursuit of complementary bilateral trade restrictions, Moscow and Washington demonstrate a tacit understanding about shared commitments to strengthening the standards for international safeguards and improving nuclear security among the states with which the two countries interact commercially.

This chapter employs an empirical approach to probe the tacit US-Russian understanding concerning managing the risks inherent in commercial nuclear trade, specifically through the bilateral nuclear cooperation framework agreements that both the United States and Russia employ. It compares the commitments to nuclear security and safeguards embodied in the 104 US and Russian cooperation agreements that were either in force or signed and awaiting final state ratification from 1990 to 2020. What emerges is a complicated but largely positive picture of parallel and complementary US-Russian strategic commitments to nonproliferation and tacit US-Russian cooperation to tailor the terms and conditions under which they agree to share their nuclear knowledge to the risk profiles of individual states.

Specifically, we find that there is growing convergence between the United States and Russia on the nuclear security and nonproliferation restrictions

[6] William C. Potter, "The origins of US-Soviet non-proliferation cooperation," in William C. Potter and Sarah Bidgood, eds., *Once and Future Partners: The United States, Russia and Nuclear Non-proliferation* (London: International Institute for Strategic Studies), 2018, pp. 23-54.
[7] Sokov, "IAEA safeguards."

contained in their bilateral cooperation agreements with customer states. This is largely due to the more restrictive terms and conditions that Russia has incorporated into the agreements it has signed since 2008. Moscow has been able to impose these higher-quality nonproliferation restrictions with both existing and emerging nuclear states at the same time that it has rapidly increased the number of cooperation agreements it has in place as well as its share of global nuclear exports. In addition, Russia and the United States maintain generally complementary portfolios of bilateral agreements: Russia has focused on signing agreements with emerging nuclear states, while the US has concluded cooperation agreements, primarily with countries that already have nuclear power in their energy mix. As a result, there are signs that the United States and Russia share a tacit understanding of how to manage the risks associated with nuclear cooperation, and this understanding has led to critical strategic complementarities on international safeguards despite the important differences that persist in the specifics of each country's nuclear security and competitive trading practices.

A prominent example of these differences is in how Russia and the US have encouraged other states to sign an Additional Protocol (AP) agreement with the IAEA. Since the IAEA Board of Governors approved the model language for the AP in 1997, the United States has adopted a directive approach, incorporating language requiring the AP in 85 percent (11 of 13) of the new bilateral nuclear cooperation agreements that it has signed. In contrast, Russia has taken a more flexible approach, adding language requiring the AP in only 38 percent (18 of the 47) of the cooperation agreements that it has signed during this time period. Despite these differences, Russia and the United States have virtually identical adoption rates for the AP among the states with which they have nuclear cooperation agreements in force (for Russia, 52 of 58 agreements, or 87 percent; for the United States, 22 of 25 agreements, or 88 percent). Similarly, the US and Russia have adopted different approaches to limit the diffusion of the capabilities for uranium enrichment and spent fuel reprocessing. The US approach is exemplified in its "gold standard" agreement with the United Arab Emirates (UAE), which commits the UAE to not undertake any enrichment or reprocessing activities. In contrast, Russia's approach focuses on preventing the transfer of the equipment and materials that a partner country would need to enrich or reprocess nuclear materials. Thus, the United States and Russia not only share the objective

of advancing nuclear security and international safeguards with newcomer nuclear states, but also bring varied and complementary approaches to the task of designing framework agreements that can be mutually reinforcing and augment related multilateral norms. Furthermore, the United States and Russia may have an opportunity to expand from this current form of tacit cooperation into explicit export control coordination and cooperation.

The chapter is organized as follows: The first part briefly reviews relevant literature on the nuclear security implications of bilateral US and Russian commercial nuclear trade and cooperation. The second section illuminates how Russia and the United States have reached a tacit understanding to exhibit restraint in how they compete for international nuclear trade and to encourage the adoption of nuclear security and nonproliferation restrictions that exceed the requirements of the IAEA and the Nuclear Suppliers Group (NSG). The third part highlights how this tacit understanding, when combined with how each country pursues commercial nuclear opportunities, has resulted in several strategic complementarities that enhance global nuclear security beyond what either country could achieve on its own. However, the tacit understanding approach also has shortcomings that erode this security, due to the way each country pursues commercial nuclear opportunities and to the nuclear risk profiles of their customers. The final section distills the implications of this analysis, including policy directions for building more explicit forms of cooperation upon the foundation of tacit understanding, and in so doing further strengthening international safeguards against the risks of nuclear proliferation.

What (We Think) We Know

Most claims about the strategic implications of the decline of US private-sector nuclear energy companies and the rise of the Russian state-controlled nuclear industry are inferred from specific historical cases or based on assumptions about the relationship that links together market power and security in the global nuclear business. Accordingly, the contemporary debate concerning US commercial nuclear policy rests on narrow empirical and analytical foundations, exaggerates the security implications of Russia's highly competitive commercial practices, and obscures common objectives and complementary opportunities to further advance global nuclear security through more explicit forms of Russia-US cooperation.

At the core of the debate about US commercial nuclear policy is the assumption that Washington's ability to set stringent global nonproliferation standards is directly linked to the market strength of the US commercial nuclear industry. This assumption dates to the dawn of the nuclear era, when US technological leadership in the peaceful uses of nuclear power contributed to both the dominance of the US nuclear industry within the rapidly growing global nuclear power market and to Washington's ability to dictate the terms under which it would share nuclear technology with other countries. The assumption that emerged from this period—that the market power of the US nuclear companies determines the US government's ability to set stringent nonproliferation standards—has gone mostly unquestioned. However, the size, growth, and share enjoyed by US companies within the emerging global nuclear market was buoyed by the superpower status of the United States and by the spread of US nuclear knowledge and technology under Washington's Atoms for Peace program, which makes it difficult to disentangle the significance of market power alone for the strength of the international nonproliferation regime.[8] Furthermore, even with the market entry of new suppliers and the trough of demand for global nuclear commerce in the 1980s, US companies remained prominent across the global nuclear industry, and, at the same time, Washington spearheaded efforts to tighten the nonproliferation regime and to avert a horizontal nuclear weapon cascade.[9]

In addition, the appropriate metrics for assessing the connection between the commercial stature of a national nuclear industry and nonproliferation remain poorly specified. The literature, for example, broadly identifies market power and reactor construction rates as decisive drivers for international influence over nonproliferation norms, but this leaves unanswered a number of important questions. Which market segments matter most in this regard? What is their relationship to political influence over the nuclear security choices of customers? As demonstrated elsewhere, there is no obvious systematic correlation between rates of foreign nuclear reactor construction and the strength of nonproliferation restrictions in bilateral nuclear trading

[8] Gattie and Massey, "Twenty-First-Century US Nuclear Power."

[9] William C. Potter, ed., *International Nuclear Trade and Nonproliferation* (Lexington, MA: Lexington Books, 1990); and Daniel B. Poneman, *Double Jeopardy: Combating Nuclear Terror and Climate Change* (Cambridge, MA: MIT Press, 2019).

commitments exhibited by either the United States or Russia.[10] The significance of ambiguity on this point is underscored by recent findings that the United States continues to be the trusted global leader at providing nuclear safety, security, capacity building, and nonproliferation services—consistently upholding the highest nonproliferation standards in its umbrella agreements—notwithstanding the US industry's relative decline and Russia's rise to dominance with more than 60 percent of today's international reactor construction and operation markets.[11]

Similarly, references to the weakness of Moscow's nonproliferation restrictions on nuclear trade are ad hoc, based on a narrow set of cases or inferred from Russia's predatory commercial behavior, rather than derived from analysis of the formal commitments the country makes in its bilateral nuclear cooperation agreements.[12] The characterization of Russia's foreign nuclear cooperation as a risk for further nuclear proliferation overlooks Moscow's posture and standing in relevant multilateral nonproliferation forums, as well as ongoing debate within Russia over how best to balance the competitiveness of the country's nuclear industry against the state's security priorities. This characterization also is untethered from a comprehensive assessment of changes that Moscow has made to nuclear cooperation policies and standard terms of supply since the

10 Adam N. Stulberg and Jonathan Darsey, "Recasting the Geopolitics of US-Russian Commercial Nuclear Rivalry: Embracing Strategic Complementarity," *Nonproliferation Review* (forthcoming).

11 Jessica Jewell, Marta Vetier, and Daniel Garcia-Cabrera, "The International Technological Nuclear Cooperation Landscape: A New Dataset and Network Analysis," *Energy Policy,* Vol. 128 (May 2019), pp. 838-852, https://doi.org/10.1016/j.enpol.2018.12.024; and James F. Keeley, "A List of Bilateral Civilian Nuclear Co-operation Agreements: Volume 5" (Calgary, CA: University of Calgary, 2009), https://dspace.ucalgary.ca/bitstream/1880/47373/11/Treaty_List_Volume_05.pdf.

12 Laura S.H. Holgate and Sagatom Saha, "America Must Lead on Nuclear Energy to Maintain National Security," *Washington Quarterly,* Vol. 41, No. 2 (2018), pp. 7-25, https://doi.org/10.1080/0163660X.2018.1484223; and Gattie and Massey, "Twenty-First-Century US Nuclear Power." For an exception, see Névine Schepers, "Russia's Nuclear Energy Exports: Status, Prospects and Implications," Nonproliferation and Disarmament Papers 61, EU Non-Proliferation and Disarmament Consortium, February 2019, https://www.sipri.org/sites/default/files/2019-02/eunpdc_no_61_final.pdf.

Soviet collapse.[13] The latter omission is especially glaring, as Russia is one of the few nuclear suppliers besides the United States that requires that a legally binding bilateral cooperation framework agreement be in place before national entities can agree to any joint nuclear energy project.[14]

Another problem is that the scholarship on supply-side pathways to nuclear proliferation generally blurs the distinction between the strategic and commercial dimensions of nuclear trading.[15] Contemporary statistical

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[13] Y. S. Pappe and N.S. Antonenko, "Changing Balance Between Private and Public Sectors in Russian Big Business in 2003-2013: The Subjective Approach," *Studies on Russian Economic Development* 25 (2014), pp. 235-245, https://doi.org/10.1134/S1075700714030083; and I. E. Frolov, "Nuclear Industry in Russia: Results of Reform, Politics, and Development Problems," *Studies on Russian Economic Development* 25 (2014), pp. 529-538, https://doi.org/10.1134/S1075700714060045.

[14] Russian Federal Law No. 170 gives the Russian government the duty of establishing "the procedure for exporting and importing nuclear facilities, equipment, technologies, nuclear materials, radioactive substances, special non-nuclear materials and services in the field of the use of atomic energy" (Chapter II, Article 9, paragraph 12). This procedure includes stipulations that any technology or knowledge exchanged with a foreign state be governed by a legally binding international agreement between Russia and that foreign state, with the terms of such an agreement taking precedent over any Russian domestic law that it may contradict (Chapter XV, Articles 65 and 68). Russian Federation, "Federal Law No.170 of 21 November 1995 on the Use of Atomic Energy, as Amended," October 20, 1995.

[15] On supply-side links to nuclear weapon proliferation, see especially Matthew Kroenig, *Exporting the Bomb: Technology Transfer and the Spread of Nuclear Weapons* (Ithaca, NY: Cornell University Press, 2010), https://www.jstor.org/stable/10.7591/j.ctt7v7z8; Matthew Fuhrmann, *Atomic Assistance: How "Atoms for Peace" Programs Cause Nuclear Insecurity* (Ithaca, NY: Cornell University Press, 2012), https://www.jstor.org/stable/10.7591/j.cttn34vg; and Robert L. Brown and Jeffrey M. Kaplow, "Talking Peace, Making Weapons: IAEA Technical Cooperation and Nuclear Proliferation," *Journal of Conflict Resolution* Vol. 58, No. 3 (2014), pp. 402-428, https://doi.org/10.1177/0022002713509052. For trenchant critiques and counterclaims, see especially Mark S. Bell, "Examining Explanations for Nuclear Proliferation," *International Studies Quarterly* Vol 60, No. 3 (2016), pp. 520-529, https://doi.org/10.1093/isq/sqv007; Alexander H. Montgomery, "Stop Helping Me: When Nuclear Assistance Impedes Nuclear Programs," in Adam N. Stulberg and Matthew Fuhrmann, eds., *The Nuclear Renaissance and International Security* (Stanford, CA: Stanford University Press, 2013), pp. 177-202, DOI:10.11126/stanford/9780804784177.003.0008; Jacques Hymans, *Achieving Nuclear Ambitions* (New York: Cambridge University Press, 2012), https://doi.org/10.1017/CBO9781139049429; Nicholas L. Miller, "Why Nuclear Energy Rarely Leads to Proliferation," *International Security,* Vol. 42, No. 2 (2017), pp. 40-77, https://doi.

studies, for instance, typically conflate strategic bilateral agreements, such as a general framework agreement that applies to all nuclear cooperation between the two states, with narrower commercial agreements that provide authorization for specific business transactions—such as the sale of a nuclear reactor or a longer-term contract to supply nuclear fuel. Consequently, these studies either underplay or altogether neglect to assess nuclear cooperation framework agreements, which are the legally binding main bilateral instruments used by governments to explicitly convey nonproliferation and administrative commitments and that help to shape all subsequent commercial deals in the nuclear sector.

While these limitations make it difficult to discern causal connections between the behavior of international supplier and customer states, there are additional challenges to drawing implications for future US-Russian cooperation. The prevailing pessimism concerning prospects for improving US-Russian alignment on international safeguards restrictions in nuclear trading stems from a binary framing of international bargaining. Within this conceptualization, the challenge confronting contemporary US and Russian officials is to elevate their shared strategic interests in strengthening international safeguards over their conflicting commercial interests in winning sales with customer states: Washington and Moscow can choose to cooperate with each other in relevant multilateral forums (for example, the IAEA or NSG) in an effort to overcome political and implementation barriers to strengthen international safeguards, or they can succumb to zero-sum rivalry that leads to distrust and a commercial race to the bottom regarding nonproliferation. On one hand, this conceptualization overstates the potential obstacles to reaching agreement between the United States and Russia by blurring the distinction between

org/10.1162/ISEC_a_00293; and Rebecca Davis Gibbons, "Supply to Deny: The Benefits of Nuclear Assistance for Nuclear Nonproliferation," *Journal of Global Security Studies,* Vol. 5, No. 2 (April 2020), pp. 282-298, https://doi.org/10.1093/jogss/ogaa003. For an exception that attributes the propensity for international proliferation to the relationship between commercial nuclear market concentration and structure and intensity of great power rivalry, see Eliza Gheorghe, "Proliferation and the Logic of the Nuclear Market," *International Security,* Vol. 43, No. 4 (Spring 2019), pp. 88-127, https://doi.org/10.1162/ISEC_a_00344.

bargaining and enforcement.[16] Although both dimensions of negotiation are predicated on a mutual interest in promoting safeguards against proliferation, bargaining and enforcement present distinctive challenges. The challenge of enforcement rests on ensuring that one's rival will not cheat on any deal to pursue alternative objectives. Although difficult, this challenge can be overcome under conditions of specific reciprocity and when there are expectations of ongoing interaction between the parties. The bargaining dimension, however, requires less onerous coordination over the technical terms and long-term distribution of the benefits of an agreement. Ironically, more durable expectations of reciprocity and repeated interaction can mitigate fears of cheating but create perverse incentives to delay agreement in pursuit of better terms. In this respect, the lack of progress in US-Russian negotiations may not be the product of mutual doubts of each other's commitment to improving international safeguards. Instead, the failure to cooperate on strengthening safeguards may result from differences between Moscow and Washington over how to implement the state-level approach to nuclear safeguards, or from the broader negotiating benefits that Moscow may believe it can obtain by the improving commercial stature of Russia's nuclear industry. Conflating the two negotiation dimensions therefore obscures commercial versus strategic bones of contention and amplifies the difficult challenge of enforcement, at the expense of probing opportunities that may exist to strengthen nuclear safeguards by coordinating practical and technical terms.

On the other hand, the binary framing that pits US-Russian security cooperation against commercial rivalry understates the distinctive characteristics and variety of forms of international bargaining. At its essence, international bargaining is not limited to only formal diplomatic negotiations. It encompasses influencing the choices by different parties using a variety of approaches, which can include tacit and coordinated unilateral dimensions. The bargaining process can be tacit, for example, where actions rather than rhetoric constitute the critical medium of communication between the parties. Communicating through actions in this context is not a form of coercion but one of bargaining, "as each country's actions are intended to

[16] James D. Fearon, "Bargaining, Enforcement, and International Cooperation," *International Organization,* Vol. 52, No. 2 (Spring 1998), pp. 269-305, https://www.jstor.org/stable/2601276.

influence an outcome that can only be achieved through some measure of joint voluntary behavior."[17] As noted by others, the US-Russian arms control and nonproliferation landscape has been marked by such a range of common action and understanding.[18] There are tacit bargains, which comprise unilateral measures with informal but specific expectations of reciprocity on both ends and means of interaction; formal coordination, which focuses agreement on common aversions; and cooperation, which specifies terms and enforcement to realize common interests. In addition, there are tacit understandings. The latter are characterized by implicit common acceptance of basic objectives and norms reflected by action taken in parallel that is complementary. In the context of greater alignment of US and Russian restrictions in bilateral nuclear trading, such action differs from purely unilateral measures, as it includes a general element of commercial self-restraint and consistent adherence to common objectives for nuclear security; it differs from tacit bargains and the other forms of international negotiation by not requiring prior communication or resting on expectations of specific forms of reciprocity.

Taking into account these considerations, several questions may help address whether there may be a wider space for US-Russian common action related to nuclear trading and efforts to strengthen international safeguards. First, in the absence of dedicated negotiations or formal agreement, is there evidence of a tacit understanding, as captured by self-restraint and convergence in qualitative restrictions in commercial nuclear deals with customer states? Do Moscow and Washington adhere equally to basic nuclear security and nonproliferation norms in these transactions? Second, to what extent do the bilateral nuclear trade practices of the United States and Russia reflect this tacit understanding? What is the character of the residual

[17] George W. Downs and David M. Rocke, Tacit Bargaining, *Arms Races, and Arms Control* (Ann Arbor: University of Michigan Press, 1990), p. 3; and Thomas C. Schelling, "Reciprocal Measures for Arms Stabilization," *Daedalus,* Vol. 89, No. 4 (Fall 1960), pp. 892-91, https://www.jstor.org/stable/20026622.

[18] See especially the discussion in Downs and Rocke, *Tacit Bargaining;* and George Bunn and David Holloway, "Arms Control without Treaties? Rethinking U.S.-Russian Strategic Negotiations in Light of the Duma-Senate Slowdown in Treaty Approval," CISAC Working Paper, February 1998, https://cisac.fsi.stanford.edu/publications/arms_control_without_treaties__rethinking_usrussian_strategic_negotiations_in_light_of_the_dumasenate_slowdown_in_treaty_approval.

international safeguards problems that are not addressed by uncoordinated but complementary US and Russian actions? Third, despite conditions of protracted commercial rivalry and political acrimony, can tacit understanding be extended to enable deeper forms of US-Russian bargaining that could address lingering safeguards challenges?

US and Russian Commercial Nuclear Trading and Self-Restraint

Nuclear supplier countries such as the United States and Russia face the challenge of balancing the benefits and risks of cooperation. Nuclear technology is inherently dual use in nature, and as a result, supplier decisions on nuclear cooperation—especially with states that lack nuclear facilities—always involve trade-offs between the economic and political benefits to be gained from sharing nuclear technology and the risks that the recipient state will misuse it. A supplier state that could share its nuclear capabilities with others must assess and balance the unique benefits and risks presented by each potential recipient state. A supplier that cooperates with many recipients and imposes few restrictions on technology that it shares may capture short-term financial benefits, but these benefits could be outweighed by the longer-term proliferation risk that such cooperation may entail. In contrast, a supplier that exercises self-restraint in its nuclear cooperation practices by demonstrating selectivity in partner choice and applying conditionality to its cooperation is likely to capture fewer financial benefits from nuclear trade, but this may generate greater security benefits over time by discouraging individual partner states from pursuing nuclear weapon capabilities.

Understanding the degree of self-restraint exhibited by a nuclear supplier state requires an examination of the full range of cooperative nuclear activities in which it engages, including the commercial and cooperation agreements that it signs. Close inspection of US and Russian nuclear cooperation agreements since 1990 shows that while both states have actively engaged with other states in bilateral nuclear cooperation and trade, this trade does not reflect unfettered business competition. Rather, both the United States and Russia have gone to great lengths to sign and bring into force umbrella agreements that stipulate varying conditions for nuclear security and restrictions on the diffusion of sensitive technologies, materials, and know-how. Far from coasting on the carryover nuclear cooperation agreements with Soviet allies that it inherited from the USSR, for example, Russia has signed 56 new

bilateral umbrella agreements since 1990, compared to 23 for the United States.[19] Nearly half of Russia's framework agreements have been signed since the late 2007 consolidation of Russia's nuclear industry within the state-owned Rosatom corporation, which in 2014 adopted its ambitious "Strategy 2030" to grow revenues from foreign sales from 47 percent of sales in 2016 to more than two-thirds of its revenues by the end of the decade.[20]

Needless to say, there is more to demonstrating national commitments to prudent nuclear export and nonproliferation policy than simply signing and bringing into force bilateral framework agreements. Critics of Russia's intentions claim that Moscow's rapidly growing portfolio of agreements is due to its willingness to accept weak nonproliferation restrictions in order to gain competitive advantage for the Russian nuclear industry, as an instrument of neo-imperialism, or as a means to constrict US commercial and diplomatic power. Yet, this broad characterization does not capture the significant variation in nonproliferation restrictions embedded in the texts of contemporary Russian and US cooperation agreements or the general tightening of restrictions in both countries over time. Moreover, a systematic comparison of the restrictions found in US and Russian nuclear framework agreements reveals that both countries have typically demonstrated export control restraint, with each state utilizing different but complementary approaches to achieving this restraint.

A comparison of nonproliferation controls in the nuclear cooperation agreements signed after 2008 to those in older agreements provides insights into the evolution of Russian and US thinking about the trade-offs between financial advantages and proliferation risks. However, such a comparison paints an incomplete picture of contemporary Russian and US nuclear cooperation

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[19] Based on a review of information in James Keeley's compilation of bilateral civilian nuclear cooperation agreements, we estimate that the USSR had in force between 15 and 18 framework nuclear cooperation agreements at the end of 1990; the uncertainty in the number is due to the lack of clarity on the termination date of many of the agreements that Keeley has compiled. The second parties to these agreements were either major nuclear supplier states or close USSR allies, and Russia inherited these agreements upon the dissolution of the Soviet Union. Keeley, "A List of Bilateral Civilian Nuclear Co-Operation Agreements."

[20] Rosatom, "Business Strategy Until 2030—Long-Term Strategic Goals," in "Rosatom 2016 Annual Report," https://ar2016.rosatom.ru/?/en/45-long-term-strategic-goals.

practices. This is due to the range in the duration of the agreements that each country signs; some of the agreements last only a few years while, at the other end of the spectrum, some are designed to remain in force indefinitely. As a result, Russia and the United States each have evolving portfolios of nuclear cooperation agreements, with the composition of their portfolios changing as new agreements come into force and older agreements expire. This evolving portfolio of agreements, in turn, should be expected to affect the positions taken by the suppliers as they weigh the economic and proliferation trade-offs.

To build an empirical basis for comparing US and Russian portfolios of nuclear trade restrictions, we reviewed and coded all bilateral nuclear cooperation agreements that were active in each country since the collapse of the Soviet Union, using the criteria described in brief below and in more detail in the Appendix. Relying on the original full text of each agreement, we assessed the quality of nonproliferation restrictions in the agreement in five key areas: requirements to adopt IAEA *Safeguards;* restrictions on *Direct Transfers* of special nuclear materials and fuel cycle equipment; limitations or prohibitions on *Enrichment* of uranium and *Reprocessing* of spent nuclear fuel; and controls over *Retransfers* of material, knowledge, or technology to third parties. After normalizing each area's raw score to a 0–100 scale, we calculated an equally weighted average of these scores to represent the overall *Nonproliferation Quality Score* (NQS) for each agreement.

Figure 1A

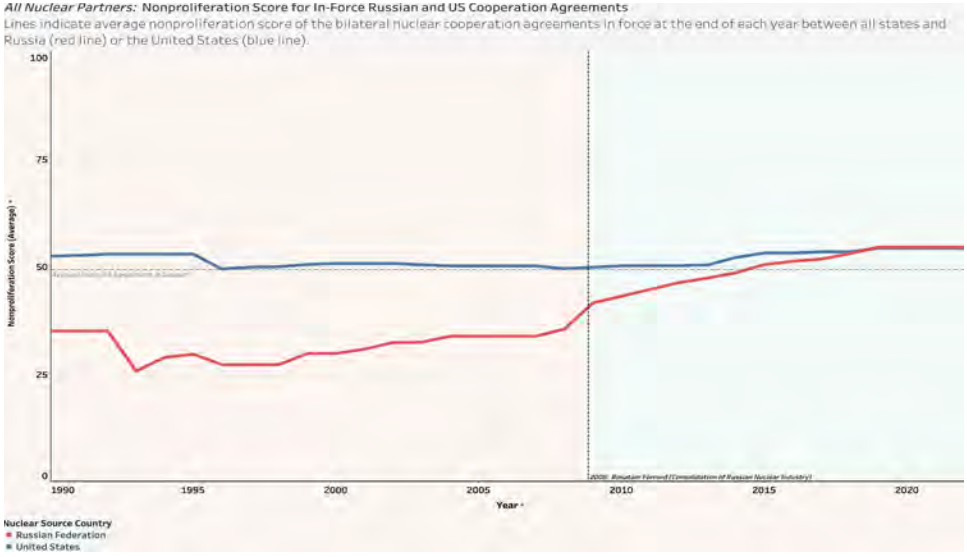
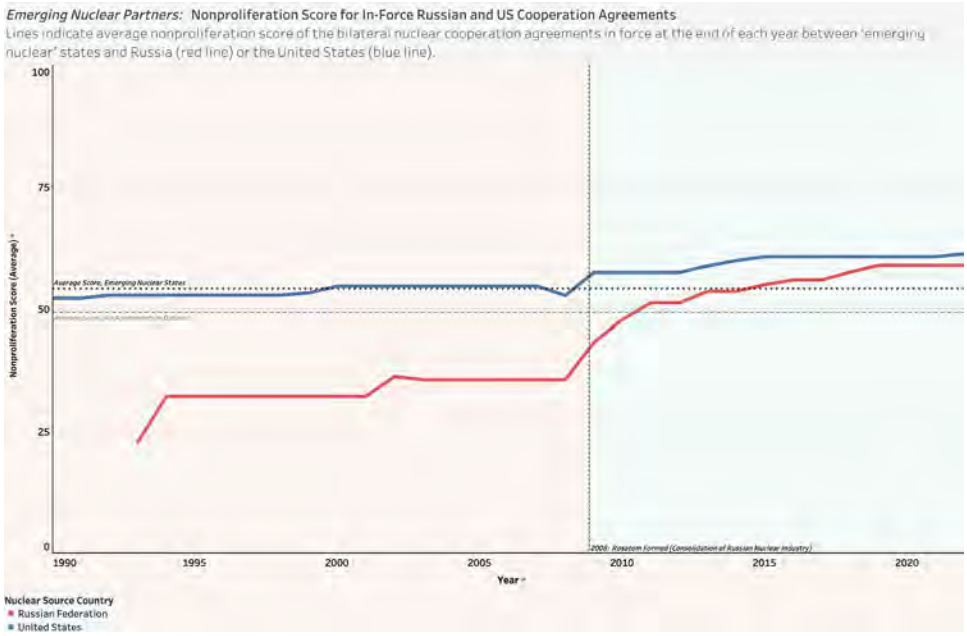


Figure 1B



Figures 1A and 1B compare the average NQS across two views of the portfolios of agreements that Russia (red line) and the United States (blue line) had in force each year from 1990 and 2020. Figure 1a, which shows the average NQS across all nuclear agreements that Russia and the United States had in force each year, and Figure 1b, which includes only agreements with emerging nuclear states, both show the trend toward convergence between the average NQS of the Russian and US portfolios over time. The slight upward slope over time of the blue line in Figure 1a reflects the overall high quality of the restrictions in the US portfolio, as well as the significant increase in its average score with emerging nuclear countries, despite the decline of the US commercial nuclear industry over the same period. The strength of the restrictions in the US portfolio is due to variable but consistently tight restrictions across all five key areas of nuclear proliferation risk, punctuated by unmatched "gold standards," characterized by complete prohibitions on indigenous enrichment and reprocessing in the cases of the 2008 agreement with the UAE and the 2013 agreement with Taiwan.

Conversely, Russia's overall portfolio from 1990 to 2008 has significantly weaker aggregate nonproliferation scores than the US portfolio does, due to very weak nonproliferation agreements consummated at or soon after the dissolution of the USSR. However, the agreements that Moscow has signed since 2009 have contained much stronger nonproliferation restrictions. Accordingly, Russia's aggregate portfolio is diffuse, with about 10 percent of agreements scoring in the bottom quartile of up to 25 points, 31 percent scoring in the second quartile, 41 percent in the third quartile, and 19 percent in the fourth—revealing Moscow's willingness to accept a broader range of nonproliferation restrictions from its partners. Moscow has dramatically increased the size of its portfolio while improving the average quality of restrictions after 2008, the period of the greatest support by the Russian state for nuclear exports. This trend is consistent across all proliferation risk areas. In fact, Moscow recently exceeded US practice on direct transfers, imposing a blanket prohibition against the transfer of any enrichment or reprocessing equipment, as well as the transfer of special nuclear materials such as highly enriched uranium and heavy water, in the vast majority (26 of 31) of agreements it has signed since 2008. These agreements also include a prohibition of the transfer of dual-use or weapon-

related technologies absent formal amendments.[21] In some cases, such as Hungary, the agreements include arrangements to take back spent fuel. Moreover, as highlighted in Figure 1b, this general pattern of improvement in the strength of Russian restrictions is particularly noticeable in the cases of nuclear energy aspirant states, which have been the focus of Russian efforts since the formation of Rosatom at the end of 2007. As discussed in a subsequent section of this paper, Russia's focus on emerging nuclear states is one of several systematic differences between its customer portfolio and the portfolio of the United States, which has chosen to more selectively engage with emerging nuclear states and to impose on these states extremely restrictive nonproliferation restrictions. In contrast, Russia's qualitative improvements are reflected across agreements in force with a diverse set of countries spanning different regions. This underscores the point that recent head-to-head commercial competition in emerging markets is far from a systematic race to the bottom in terms of the quality of nonproliferation restrictions extended by Washington and Moscow.

The factors underlying these aggregate changes can be seen in Figure 2, which presents a detailed comparison of Russian and US nuclear cooperation agreements, divided into those signed before (2a) and after (2b) the formation of Russia's state nuclear company Rosatom at the end of 2008. Each chart disaggregates the scores for Russia (red) and the United States (blue) across the five nonproliferation restriction areas and includes a cumulative average score ("Total Score"). The dashed lines show the coefficient of variation for these average scores, calculated by dividing the standard deviation by the mean; low values for the coefficient of variation indicate that the underlying scores are clustered tightly around the mean, while higher values indicate greater dispersion.

[21] This echoes earlier Soviet practices in the 1960s and 1970s of putting in place spent fuel take-back provisions. See the discussion in William C. Potter, "The Soviet Union and Nuclear Proliferation," *Slavic Review,* Vol. 44, No. 3 (Fall 1985), pp. 468-488, https://www.jstor.org/stable/2498015.

Figure 2A

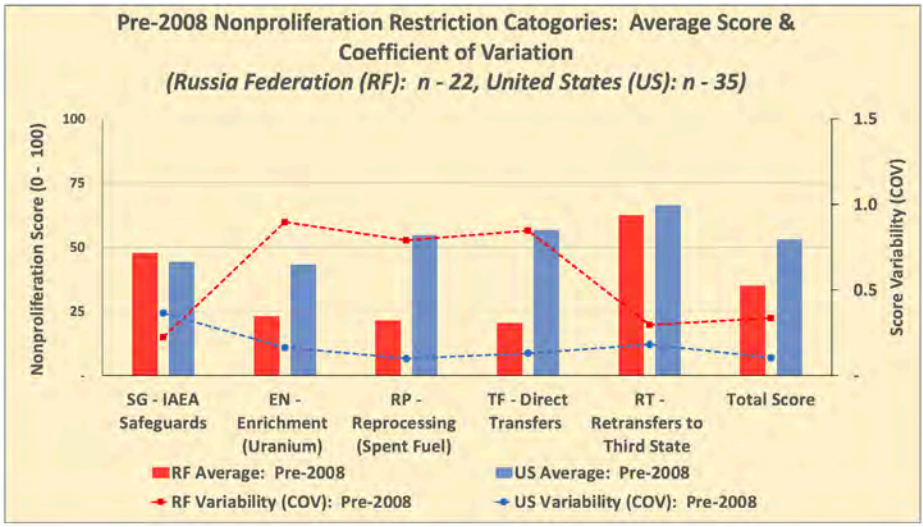


Figure 2B

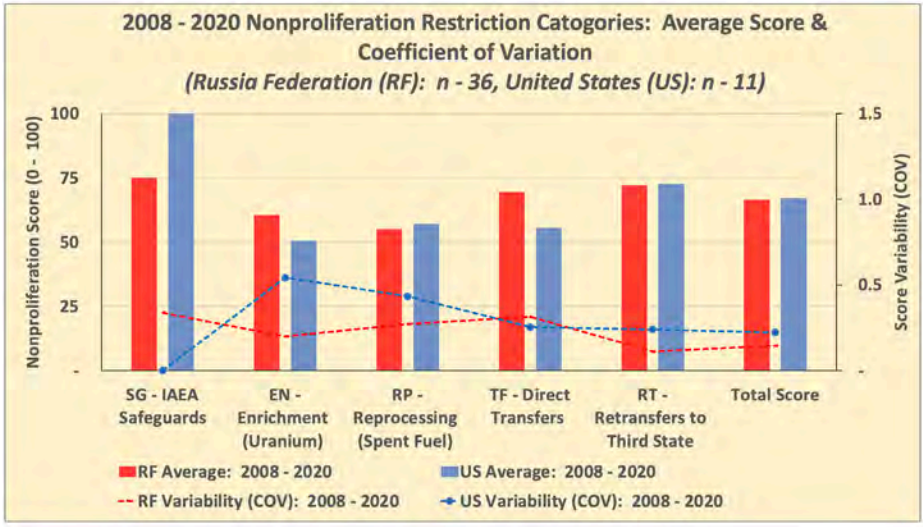


Figure 2 illuminates several points of convergence and divergence between the Russian and US approaches toward bilateral nuclear cooperation. First, both countries have demonstrated a commitment to improving the strength of the proliferation controls they incorporate into their nuclear cooperation agreements. This can be seen in the improvements observed in Figure 2A versus 2B for both Russia and the United States, across all measures of nonproliferation restrictions contained in each country's cooperation agreements. Second, while both countries have made improvements across all five nonproliferation areas, there are differences in how each country has prioritized these improvements. The United States, for example, stands out with a 100 score for "IAEA Safeguards" across the agreements signed since 2008. This score reflects a change in US policy, conditioning new or renewed nuclear cooperation accords on the partner state's ratification of the AP. Russia has made less progress in this area, as it does not mandate that its commercial customers adopt the AP as a formal condition of cooperation. However, Russia shows much closer alignment with the United States in its efforts to strengthen restrictions on the direct transfer of special nuclear material and sensitive nuclear technologies, as well as on partner country nuclear fuel cycle activities using Russian materials, equipment, or knowledge. This progress is reflected in the enhanced consistency across Russian agreements, including the inclusion of a clause prohibiting the transfer of sensitive nuclear equipment to partner states that do not already possess fuel cycle facilities. Similarly, there is a clause in all Russian agreements that requires that the partner state receive written approval from the Russian government before performing any fuel cycle activities; while the United States usually incorporates similar language, it does not do so in six of its current agreements. The net result of these changes is that the bilateral nuclear cooperation agreements that Russia has signed since 2008 are notable for their similarity rather than their difference from those signed by the United States despite the fact that Moscow has more than doubled the number of cooperation agreements that it has in force over this time period.

A second area of convergence relates to restrictions in framework agreements made by the United States and Russia with emerging nuclear energy states. These recipient states present a mix of nonproliferation benefits and risks. On one hand, the cooperation agreements can help ensure that states aspiring to add nuclear power to their energy mix devote sufficient resources and attention to developing the legal, regulatory, institutional, and security infrastructure

needed to support the safe use of nuclear power. In practice, this build-out requires increased interactions and collaboration with the IAEA, the nuclear regulatory and export control institutions within the home governments of the companies supplying critical reactor components, and other public and private actors involved in nuclear safety and security. These enhancements to the recipient state's nuclear infrastructure, along with the greater scope and scale of interactions with outside nuclear governance entities, increase the global community's ability to assess the nuclear capabilities and intentions of these states. On the other hand, an emerging nuclear country that develops certain stages of the fuel cycle can gain access to dual-use material and knowledge that could be transferred or diverted to an illicit weapon program, thus increasing nuclear security and proliferation risks.

Accordingly, the nonproliferation terms embedded in bilateral nuclear cooperation agreements can influence the mix of benefits and risks associated with an emerging nuclear state's development of a commercial nuclear capability. For example, bilateral cooperation agreements that encourage or compel the partner state's acceptance of global nonproliferation norms and the institutions through which these norms are enforced—such as the IAEA's comprehensive safeguards agreements (CSAs), the Additional Protocol to these agreements, and the modified Small Quantities Protocol (SQP), which increases IAEA oversight for countries without nuclear facilities—can reduce the partner state's likelihood of pursuing nuclear weapons as well as provide evidence of the benefits of accepting the full range of current IAEA safeguards. Furthermore, Russia and the United States are free to enhance their cooperation agreements with terms and conditions in areas not addressed in IAEA safeguards agreements, such as the customer's acquisition and use of fuel cycle facilities. Similarly, the two countries can insist on language that is more stringent than the standard IAEA language in areas such as the storage of, accounting for, and access by outside parties to the partner state's nuclear materials. Accordingly, the terms of Russian and US nuclear cooperation framework agreements with emerging nuclear countries can contribute to reducing proliferation risks.

To assess the coverage and strength of Russian and US nuclear cooperation agreements with these important states, we used reports from the World Nuclear Association, the Nuclear Threat Initiative (NTI), and the IAEA to

develop a consensus list of emerging nuclear states and ranked these states by their relative likelihood of having one or more nuclear power plants in commercial operation by 2050. For example, the three countries currently building their first commercial nuclear power plants—Turkey, Belarus, and the UAE—received a score of "1-NPP Under Construction," and the two countries that have signed contracts for the construction of new nuclear power plants (Egypt and Poland, both with Russia) received the next highest ranking, "2-Contract for NPP Signed." Figure 3 presents a grouped and ranked list showing these and other countries where progress toward commercial nuclear operation is shown, ranging from "3-Committed Plans" to "6-Discussion as a Policy Option," as well as the nonproliferation restriction score for each Russian and US agreement with these emerging nuclear countries.

This chart challenges the claim that Russia is engaged in the widespread erosion of nuclear nonproliferation standards as part of a zero-sum race to the bottom with the United States, but there are several caveats. The first and most obvious observation from this chart is that Russia has extended nuclear cooperation agreements to significantly more emerging nuclear countries than the United States (28 vs. 13).[22] While this could reflect a greater tolerance by Russia for risky nuclear trade, the hybrid financial and legal structure of Rosatom is also likely to be a factor. Under Russian law, Rosatom plays multiple roles, among them regulation of the domestic nuclear industry, enforcement of Russia's domestic nuclear trade laws, and negotiation and monitoring of international nuclear treaty obligations. It also serves as the "master contractor" for all external commercial nuclear contracts involving Russian nuclear entities. Although this creates agency and accountability risks internally, it also means that Rosatom is not driven by market logic to the same extent as its private-sector competitors in the United States. In addition, the Russian government by law provides Rosatom with guaranteed access to funds to finance foreign commercial activities. As a state corporation,

[22] The paucity of countries that have at least committed to firm nuclear development plans, as indicated by a score of three or above, reveals that Russia has cooperation agreements in place with many countries that are far from certain to build and operate a commercial nuclear power plant with the strict security controls required to meet international safety and nonproliferation standards.

Figure 3

Emerging Nuclear States: Russian and US Nuclear Cooperation Framework Agreements

Nuclear Power Status	Region	Emerging Nuclear State	NUCLEAR PARTNER COUNTRY: NO RF / US AGREEMENT	RUSSIAN AGREEMENT	US AGREEMENT
1 - NUCLEAR POWER PLANT (NPP) UNDER CONSTRUCTION	*ASIA*	TURKEY		65	67
	EUROPE	BELARUS		60	
	MIDDLE EAST / NORTH AFRICA	UAE		65	95
2 - CONTRACT SIGNED FOR NPP	*EUROPE*	POLAND			39
	MIDDLE EAST / NORTH AFRICA	EGYPT		42	67
3 - COMMITTED NUCLEAR PLANS	*ASIA*	UZBEKISTAN		75	
	MIDDLE EAST / NORTH AFRICA	JORDAN		75	
4 - WELL-DEVELOPED NUCLEAR PLANS, COMMITMENT PENDING / DEFERRED	*ASIA*	INDONESIA		37	67
		KAZAKHSTAN		23	67
		THAILAND			54
		VIETNAM		44	69
	EUROPE	LITHUANIA			39
	MIDDLE EAST / NORTH AFRICA	SAUDI ARABIA		52	
5 - DEVELOPING NUCLEAR PLANS	*AFRICA (SUB-SAHARAN)*	ETHIOPIA		65	
		GHANA		75	
		KENYA	■		
		NIGERIA		65	
		RWANDA		60	
	ASIA	LAOS	■		
		PHILIPPINES			44
	MIDDLE EAST / NORTH AFRICA	ALGERIA		51	
		MOROCCO			67
6 - NUCLEAR IN DISCUSSION AS POLICY OPTION	*AFRICA (SUB-SAHARAN)*	NAMIBIA	■		
		SUDAN		60	
	ASIA	AZERBAIJAN	■		
		MONGOLIA		34	
		SINGAPORE	■		
		SRI LANKA	■		
	EUROPE	ALBANIA	■		
		CROATIA			39
		ESTONIA			39
		LATVIA			39
		SERBIA		70	
	LATIN AMERICA	BOLIVIA		65	
		CHILE		43	
		CUBA		75	
		PARAGUAY		73	
		PERU		38	67
		VENEZUELA		65	
	MIDDLE EAST / NORTH AFRICA	ISRAEL	■		
		LIBYA		65	
		QATAR	■		
		SYRIA		37	
		TUNISIA		65	

NUCLEAR PARTNER COUNTRY
NO RF / US AGREEMENT
RUSSIAN AGREEMENT
US AGREEMENT

Rosatom is further insulated from the commercial risks resulting from new plant construction and licensing delays that have been detrimental to the profitability of the US nuclear industry.

While the structure of Rosatom may allow it to consider working with a larger set of potential customers than US firms, there is little evidence that Moscow is seeking to acquire these customers through weaker terms in its nuclear cooperation agreements. Of the 17 emerging nuclear countries that have the least developed plans (scoring a 5 or 6 on the emergence scale), Russia has in 12 cases agreed to terms that are significantly stronger than the average of the 104 agreements in the Russia-US dataset.[23] These agreements also are close (but not equivalent) in substance to the level of restrictions in the gold standard agreements that the United States has concluded with Taiwan and the UAE.[24] In addition, they all contain spent fuel return services, and Russia likewise maintains the right to add conditions to subsequent commercial arrangements or to unilaterally cancel the agreement without cause.

There are two significant areas of concern about Russia's cooperation with emerging nuclear countries that can be seen in this chart. The first is that in all but one of the seven emerging nuclear states where both Russia and the United States have cooperation agreements in place, Moscow has agreed to significantly weaker restrictions than has Washington. While there are mitigating factors concerning some of these cases, there are legitimate concerns over Russia's "lowball" agreements with countries, such as Egypt and Vietnam, that represent higher risks of proliferation. The second concern is that the scores for Russia's agreement become less consistent with the states that have lower probability of acquiring nuclear capabilities that appear toward the bottom of the chart. This is of particular concern with Syria, which received a score of 37, and Mongolia, which received a score of 34, as

[23] In three additional cases (Saudi Arabia, Chile, and Algeria), Russia's terms are within 10 percent of the dataset average.

[24] These Russian agreements contain terms that prohibit the transfer of any enrichment or reprocessing facilities, equipment, or materials to these states; prohibit enrichment of uranium to levels above 20 percent uranium-235; and require the prior written approval of the Russian government before the partner state engages in any activities using any materials, equipment, knowledge, or dual-use items that are transferred under the agreement.

these two Russian partners present higher risks on several measures including nuclear theft and weak export controls, as detailed below.

Overall, however, the picture presented by Russian and US coverage of emerging nuclear states is one of complementarity. Russia is able and willing to enter into cooperation agreements with countries with which the US government has been unwilling or unable to conclude a framework nuclear agreement and where the ratio of financial risks to market benefits is unattractive to US commercial nuclear companies. This has benefits to the global nuclear nonproliferation regime, regardless of how many of these countries ultimately acquire commercial nuclear power plants, as it sets them on a path to deeper integration into the international nuclear security regime under Russian tutelage.

US-Russian Tacit Understanding in Action: A Holistic Picture

A more holistic picture of the tacit understanding between the United States and Russia can be seen by extending the above analysis of the internal structure of nuclear cooperation agreements to how these structures align with other initiatives to reduce the risks of nuclear proliferation. One such external initiative where tacit understanding between Russia and the United States may exist—leading to positive outcomes supporting the global nonproliferation regime—is in guiding customer states to accept and ratify more rigorous IAEA safeguards. These enhanced safeguards are voluntary modifications to the mandatory CSA that each state that is party to the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) must have in force with the IAEA. The first of these enhancements to the CSA—the 1997 Model Additional Protocol—applies to all states, while the second—the IAEA Board of Governors' 2005 modified SQP—applies only to states with less than one kilogram of special fissionable material, no such materials introduced into nuclear facilities, and no plans to construct dedicated nuclear facilities.[25] The AP advances nonproliferation standards by expanding IAEA monitoring to include all nuclear materials and facilities in a non-nuclear-

[25] International Atomic Energy Agency, *Safeguards Implementation Guide for States with Small Quantities Protocols,* IAEA Services Series 22, June 2016, pp. 4-5. https://www.iaea.org/publications/10493/safeguards-implementation-guide-for-states-with-small-quantities-protocols.

weapon state, granting short-notification IAEA access to all state nuclear facilities and records and permitting the IAEA to consider non-IAEA sources in its annual state-level verification process. The modified SQP enhances nonproliferation standards by reducing the number of abeyances granted to SQP states from certain annual safeguards reporting requirements, as well as increasing the speed and intensity of the IAEA's initial review of states that no longer qualify for the SQP due to acquisition of one or more kilograms, or the equivalent, of fissionable nuclear materials or the construction of a dedicated nuclear facility.

As depositary governments for the NPT and permanent members of the IAEA board, Russia and the United States were instrumental in the development and approval of the AP and the revised standard text for the SQP. In addition, both governments have demonstrated their commitment to enhanced safeguards by ratifying the AP and the modified SQP even though neither government is required under the NPT to conclude safeguards agreements with the IAEA. However, the two states appear to have conflicting opinions regarding the appropriate means to secure adoption by other states of enhanced safeguards. Specifically, Russia advocates a traditional Westphalian conceptualization of the international system that privileges state sovereignty and regards this sovereignty as the foundation of international law, the institutions of global governance, and the stability and predictability of the international environment.[26] As a consequence, Russia takes the position that each state has the right to freely decide whether to voluntarily accede to international obligations such as the AP that constrain a state's sovereignty. In contrast, the United States advances a more limited view of sovereignty, which it has demonstrated through a willingness to use inducements and threats to support the adoption by other states of international obligations such as the AP. Russia has rejected the US approach to the AP, as well as to the state-level concept. The state-level concept allows the IAEA to incorporate information provided by non-IAEA sources into the annual assessment of a state's compliance with its IAEA safeguards agreement that the IAEA Board of Governors reports in its annual Safeguards

[26] Charles Ziegler, "Contrasting U.S., Chinese and Russian Perceptions of Sovereignty," *Sravnitel'nata politika (Comparative Politics Russia)* Vol. 3, No. 1 (2012) p. 16, https://doi.org/10.18611/2221-3279-2012-3-1(7)-14-22.

Figure 4

	Russia	US	Total	% of All Russia Agreements	% of All US Agreements	% of All Agreements
Russian and US Bilateral Nuclear Cooperation Agreements Signed and/or in Force 1990-2020	58	46	104	100%	100%	100%
PERIOD I: Bilateral Cooperation Agreements Signed before Additional Protocol (AP) Adopted by IAEA (pre May, 1997)	11	30	41	19%	65%	39%
AP not required, but AP in force (signed prior to May 1998)	9	26	35	16%	57%	34%
Group I Problem Agreements: AP not required, AP not in force (agreement signed prior to May 1997)	2	4	6	3%	9%	6%
PERIOD II: Bilateral Cooperation Agreements Signed after Additional Protocol (AP) Adopted by IAEA (post May 1997)	47	16	63	81%	35%	61%
Bilateral Nuclear Cooperation Agreements with AP requirement	18	11	29	31%	24%	28%
Less: AP required, but AP entered into force before cooperation agreement signed	17	11	28	29%	24%	27%
Group II Problem Agreements: AP required, but AP not in force (agreement signed after May 1997)	1	0	1	2%	0%	1%
Bilateral Nuclear Cooperation Agreements without AP requirement	29	5	34	50%	11%	33%
Less: AP not required, but AP in force (agreement signed after May 1997)	18	5	23	31%	11%	22%
Group III Problem Agreements: After 1997 (AP), AP not required, AP not in force	1	0	1	2%	0%	1%
TOTAL PROBLEM AGREEMENTS (PROBLEM AGREEMENTS GROUPS I, II, III)	**14**	**4**	**18**	**24%**	**9%**	**17%**

Implementation Report (SIR), and Russia argues that this subjects the implementation of the safeguards system to politicization.[27] Specifically, Russia claims that the United States and its allies have utilized the state-level concept to dominate the IAEA, manipulate the safeguards verification process, and advance their political agenda against states they oppose.[28]

This difference in Russian and US perspectives on enhanced IAEA safeguards is apparent in the text of the two countries' bilateral nuclear cooperation framework agreements. The nuclear cooperation agreements of both the United States and Russia require that the partner state have a CSA in force with the IAEA. The United States and Russia differ, however, in their stance toward the enhanced safeguards of the AP, as the United States requires the AP as a prerequisite for any new nuclear cooperation agreement while Russia does not always make this requirement. However, this difference in approaches does not translate into significant variations in the rate of adoption of either the AP or of the modified SQP by recipient states, which suggests that encouraging AP adoption may be a second area of tacit understanding between Washington and Moscow with regard to bilateral nuclear cooperation agreements.

Figure 4 illustrates this point by analyzing the terms and requirements around IAEA safeguards contained in the 58 Russian and 46 US agreements in the dataset. For each of the agreements, we considered the IAEA safeguards requirements contained within the text of each agreement, as well as the partner state's current status with regard to adopting the AP and, if appropriate, the enhanced text to the SQP. Since the AP and SQP are supplementary documents to a state's CSA, we first examined the extent to which Russian and US agreements contain a requirement that the partner state have in force a CSA with the IAEA.

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[27] Grigory Berdennikov Russian Federation, "Statement by the Head of the Delegation of the Russian Federation Ambassador-at-Large Grigory Berdennikov," IAEA Symposium on International Safeguards: Linking Strategy, Implementation and People, Vienna, October 20-24, 2014, https://www.iaea.org/sites/default/files/19/03/cn-220-berdennikov-statement.pdf.
[28] Robert Einhorn, "Prospects for U.S.-Russian Nonproliferation Cooperation," Brookings Institution, February 26, 2016, https://www.brookings.edu/research/prospects-for-u-s-russian-nonproliferation-cooperation.

One point of convergence between Russia and the United States is in how each frames its cooperation agreements as complementing the NPT and as reinforcing the IAEA's primary role in monitoring each state's adherence to its terms. All but three of the agreements in the dataset include either a joint affirmation of commitment to the NPT in the agreement preamble, a requirement that the partner state have in force a safeguards agreement with the IAEA for the cooperation agreement to be considered valid, or language specifying the consequences if the IAEA can no longer confirm that the partner state is acting in compliance with the NPT. Russia and the United States share an exception to this requirement with their early 1990s agreements with China, but as an NPT-recognized nuclear-weapon state, China is exempt from the NPT/IAEA safeguards requirement.[29]

Russian and US approaches diverge for the bilateral cooperation agreements each country signed after the 1997 approval of the Model Additional Protocol, which constitute approximately 80 percent (47 of 58) of Russia's agreements and 30 percent of those signed by the United States (13 of 46). Of these agreements, 77 percent of US agreements (10 of 13) contain a requirement that the partner country have an AP agreement in place with the IAEA, whereas only 38 percent of Russia's agreements (18 of 47) specify this requirement. In addition, of the three US agreements lacking an AP requirement, Australia (2010) had signed and ratified the AP prior to the US agreement, and Ukraine (1998) and Turkey (2000) concluded and ratified the AP prior to the entry into force of their US agreements. However, this high degree of US support for the AP is less impressive than it first appears, as Washington signed eight of the 10 agreements requiring the AP after the partner country had already brought the AP into force, and in the other two cases the countries in question—India and the UAE—were in advanced talks

[29] The other exception to the CSA requirement is Russia's 1992 cooperation agreement with Kazakhstan, which the two parties signed as the newly independent state was in the process of finalizing its CSA with the IAEA; furthermore, this agreement had an initial duration of only two years but was renewable, with its renewal conditional on the final ratification by Kazakhstan of the IAEA agreement.

Figure 5

Problem State Counter	Nuclear Recipient State	Nuclear Source State	Year Cooperation Agreement Entered Into Force	Cooperation Agreement In Force?	*Problem Agreement Counter*	Is Recipient Small Quantities Protocol (SQP) State?	Has IAEA Notified Recipient that Modified SQP Required?	Modified SPQ In Force for Recipient State?	Cooperation Agreement Requires Additional Protocol (AP)?	AP Signed by Recipient State?	Comments
1	ALGERIA	RUSSIA	2014	✓	*1*	✗	✗	NA	✗	✓	AP signed in 2018 but not yet finalized/ratified by Algeria and IAEA Board; no obvious concerns over ratification.
2	ARGENTINA	RUSSIA	2018	✓	*2*	✗	✗	NA	✗	✗	Brazil and Argentina have 'Quadripartite Agreement' with IAEA that goes beyond standard IAEA comprehensive safeguards agreement, but it does not address potential for undeclared nuclear material or facilities. Nonetheless, in 2011 the Nuclear Suppliers Group (NSG) decided to treat this agreement as equivalent to an Additional Protocol agreement (1).
2	ARGENTINA	US	1996	✓	*3*	✗	✗	NA	✗	✗	*Ibid.*
3	BELARUS	RUSSIA	2009	✓	*4*	✗	✗	NA	✗	✓	AP signed in 2003, but Belarus and IAEA Board have not finalized/ratified.
4	BOLIVIA	RUSSIA	2016	✓	*5*	✓	✓	✗	✗	✓	AP signed in 2019 but not yet finalized/ratified by Bolivia and IAEA Board; no obvious concerns over ratification.
5	BRAZIL	RUSSIA	1994	✓	*6*	✗	✗	NA	✗	✗	Brazil & Argentina have 'Quadripartite Agreement' that enhances CSA with IAEA. Brazil has refused to sign AP arguing it unfairly treats non-NWS and that NWS have not complied with NPT Aricle VI disarmament pledges (2).
5	BRAZIL	US	1972	✓	*7*	✗	✗	NA	✗	✗	*Ibid.*
5	BRAZIL	US	1997	✓	*8*	✗	✗	NA	✗	✗	*Ibid.*
6	EGYPT	RUSSIA	2008	✓	*9*	✗	✗	NA	✗	✗	Egypt has stated it will not negotiate or agree to AP until NWS begin disarmament under NPT Article VI pledges (3).
6	EGYPT	US	1981	✓	*10*	✗	✗	NA	✗	✗	
7	IRAN	RUSSIA	1992	✓	*11*	✗	✗	NA	✗	✓	AP signed in 2003, and the IAEA Board has deemed the AP 'effectively in force', but it has not been finalized/ratified by Iran and the IAEA Board. Note--The Joint Comprehensive Plan of Action (JCPOA) that lifted some sanctions on Iran required that Iran ratify the AP.
8	MYANMAR	RUSSIA	2002	✓	*12*	✓	✓	✗	✗	✓	AP signed in 2013, but not finalized/ratified by Myanmar and the IAEA Board.
9	SAUDI ARABIA	RUSSIA	2015	✓	*13*	✓	✓	✗	✗	✗	Saudi Arabia has in force a Small Quantities Protocol agreement that does not conform with Modified SQP terms. The IAEA Board has informed the Kingdom that its current nuclear activities exceed limitations of SQP and that the current SQP is subject to cancellation. However, Saudi Arabia has not started formal negotiations with the IAEA to join the AP.
10	SUDAN	RUSSIA	2017	✗	*14*	✓	✓	✗	✗	✗	Sudan has not started formal negotations with the IAEA to either join the AP or to adopt the modified SQP language.
11	SYRIA	RUSSIA	1999	✓	*15*	✗	✗	NA	✗	✗	IAEA informed Syria of SQP suspension in 2003 but has taken no further action due to Syrian Civil War. Syria has not begun negotiation with IAEA over AP (3).
12	TUNISIA	RUSSIA	2016	✓	*16*	✗	✗	NA	✗	✓	AP signed in 2005, but Tunisia and IAEA Board have not finalized/ratified.
13	VENEZUELA	RUSSIA	2008	✓	*17*	✗	✗	NA	✗	✗	Venezuela has not initiated negotions with the IAEA over AP.
14	ZAMBIA	RUSSIA	2016	✓	*18*	✓	✓	✗	✓	✓	AP signed in 2009, but Zambia and IAEA Board have not finalized/ratified.

(1) David Jonas, John Carlson, Richard Goorevich, "The NSG Decision on Sensitive Nuclear Transfers: ABACC and the Additional Protocol," *Arms Control Today*, November 2012, https://www.armscontrol.org/act/2012-11/nsg-decision-sensitive-nuclear-transfers-abacc-additional-protocol.
(2) Jonas, Carlson, and Goorevich, "NSG Decision."
(3) John Carlson, "Nuclear Weapons Prohibition Treaty: A Safeguards Debacle," *Trust & Verify*, No. 158 (Autumn 2017), pp. 1-6, https://www.vertic.org/media/assets/TV/TV158.pdf.

with the IAEA over the AP.[30] Russia presents a similar record, as 17 of its 18 agreements containing an AP requirement were with states where the AP was already in force, and the remaining state (Zambia) had signed but not ratified the AP prior to signing a cooperation agreement with Russia. Accordingly, these cases where nuclear cooperation agreements are conditional on partner state ratification of the AP could be the result of the United States and Russia using nuclear cooperation as an inducement for a state's acceptance of the AP. But it is equally plausible that these cases are the result of selection bias, where Russia and the United States prefer to extend nuclear cooperation privileges to those countries whose tangible commitments to nonproliferation have been accredited and legitimated by the IAEA. In either case, the inclusion of an AP requirement in nuclear cooperation agreements demonstrates US and Russian support for the AP, but there is insufficient evidence to conclude that such requirements alone substantively advance global nonproliferation goals.

The agreements Russia has signed after 1997 present a more complicated picture, as 29 of these do not require the AP. Eleven (38 percent) of these agreements were with countries that had AP agreements in force already with the IAEA, and a further seven (24 percent) ratified the AP after their Russian bilateral cooperation agreement came into force. Looking across all Russian agreements that lack an AP requirement, in 70 percent of the cases (27 of 40), the nuclear activities of Russia's partner country already came under enhanced AP safeguards. This is lower than the equivalent statistic for the United States, where in 86 percent of the cases (31 of 36) the US partner country has nuclear activities under enhanced AP safeguards. However, Russia's numbers are not so far off as to suggest that Russia is undermining enhanced IAEA safeguards, such as by actively choosing cooperation partners that are at risk of noncompliance or by discouraging its cooperation partners from ratifying the AP.

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[30] In the case of India, arguably both the United States and Russia are in violation of Paragraph 12 of the "Principles and Objectives Decision of the 1995 NPT Review Conference," which prohibits nuclear trade with states lacking full-scope/comprehensive safeguards. See "Decision 2: Principles and Objectives for Nuclear Non-Proliferation and Disarmament," NPT/CONF.1995/32 (Part I), Annex, United Nations, 1995, https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/1995-NPT/pdf/NPT_CONF199501.pdf.

Fourteen Russian and four US agreements are potentially problematic due to the customer state's lack of ratification of the AP. As depicted in Figure 5, seven of these 14 agreements are with states that have signed the AP but not yet completed the steps required for its ratification.[31] A further seven agreements are with three states (Argentina, Brazil, and Egypt) that have agreements in force with both Russia and the United States. These three states present a significant—and shared—challenge for Russia and the United States, as each refuses to negotiate or sign the AP, ostensibly due to what it perceives to be little progress by the nuclear-weapon states toward fulfilling their Article VI NPT disarmament pledges.[32] The final four agreements are all with Russia and also problematic. Saudi Arabia is an SQP state that has announced plans to develop commercial nuclear reactors, which will result in the loss of its current SQP status. However, Saudi Arabia has not begun formal negotiations with the IAEA over signing the AP, and it has indicated that its commitment to the NPT is conditional on Iran's continuing status as a non-nuclear-weapon state. The IAEA rescinded Syria's SQP in 2006 due to the country's lack of cooperation with the agency's verification processes, and its continuing civil war threatens overall peace and stability in the Middle East. Political instability also is a concern in Venezuela and Sudan, neither of which has adopted the new model SQP language despite receiving compliance warning letters from the IAEA in 2005-2006. As a whole, this analysis shows that Russia has entered into a limited number of agreements with partners that have not demonstrated full support for international norms regarding nonproliferation safeguards. It also shows that while Russia's soft approach to gaining its partners' acquiescence to enhanced safeguards may not be optimal, this does not necessarily vindicate the approach embraced by the United States.

A second area in which to assess the tacit understanding between Russia and the United States relates to the risk profiles of their customer states with

31 Figure 5 shows two US agreements with Brazil. This reflects the facts that the 1972 US-Brazil cooperation agreement expired during the study period, which the two parties replaced with a new agreement with different terms in 1997.

32 David Jonas, John Carlson, and Richard Goorevich, "The NSG Decision on Sensitive Nuclear Transfers: ABACC and the Additional Protocol," *Arms Control Today,* November 2012, https://www.armscontrol.org/act/2012-11/nsg-decision-sensitive-nuclear-transfers-abacc-additional-protocol.

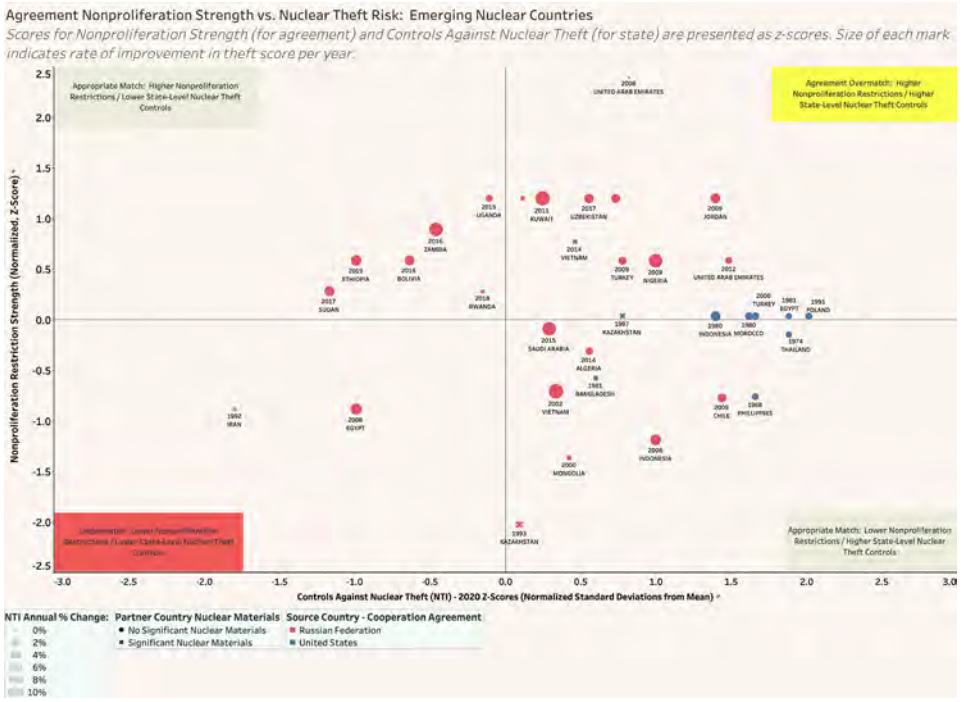
regard to the theft of nuclear materials. While such theft is a concern at some level for all states with nuclear materials or facilities, the risk is particularly acute in emerging nuclear states that are in the process of developing the legal, regulatory, security, and physical infrastructure required to effectively use commercial nuclear power and to protect nuclear materials, knowledge, and facilities. Close bilateral nuclear cooperation with a responsible nuclear supplier can be critical during this time, as the emerging nuclear state faces foundational legal, regulatory, and operational decisions that will help determine the security and safety of its nascent nuclear power assets far into the future.

Figure 6 examines the nuclear risk landscape of Russian and US bilateral cooperation agreements with emerging nuclear states, plotting the strength of the nonproliferation restrictions in each framework agreement on the y-axis against the quality of the partner state's controls against nuclear theft. The latter measure is based on the report issued every other year by NTI, which assesses a broad range of state capabilities, agreements, and conditions that contribute to the protection of nuclear materials, knowledge, and equipment against theft. Both measures are presented as z-scores, which normalize the raw score for each agreement measure to the number of standard deviations of the score versus the mean of all observations. This has the benefit of dividing the chart into four quadrants of equal size and shape, with those scores to the right of the zero line (for the x-axis) or above the zero line (for the y-axis) representing scores that are above average, and those that are below or to the right of the line representing normalized scores that are below average. The normalized scaling makes distances on the vertical and horizontal axis directly comparable. For example, an agreement that has a normalized score of +1 for "Controls against Nuclear Theft," such as the 1980 US agreement with Morocco, is one standard deviation higher than the average score across all agreements for "Controls against Nuclear Theft"; likewise, a "Nonproliferation Restriction Strength" score of +1, such as Russia's 2016 agreement with Zambia, is one standard deviation better than the average for this score across all agreements.

With this normalized scaling of the two variables, the axes in Figure 6 divide the chart into four quadrants, each of which represents agreements that score above or below the average for the overall agreement scores (y-axis) and

the nuclear theft scores (x-axis). As a result, the agreements in the top right quadrant are the highest quality, as these agreements contain nonproliferation terms that are more restrictive than average, in addition to the partner state having higher than average nuclear export controls. Likewise, the agreements in the lower left quadrant are the most problematic, as they score below average for NTI's assessment of their nuclear theft controls, and the cooperation agreements in place do little to improve these controls, as the nonproliferation restrictions incorporated into the terms of these cooperation agreements are below average.

Figure 6



As the figure illustrates, the majority of US agreements are to the right side of the vertical axis, which means these agreements are with states that have above-average controls against nuclear theft. This suggests that the United States may make its cooperation conditional on the partner state

having a relatively well-established set of nuclear security controls in place. Furthermore, many of the most widely touted US agreements, including the gold standard agreement with the UAE, are in the upper right quadrant, representing agreements with stronger-than-average nonproliferation restrictions by the United States applied to states that already have strong nuclear theft controls. The size of the UAE marker, which indicates the average annual improvement in NTI theft scores from 2012–2020, is also small, which indicates that the UAE has made consistent but relatively modest improvements in its nuclear theft controls since 2012. The findings suggests that the USUAE agreement may not have a significant positive effect on overall nuclear proliferation risk through theft; it also suggests that the strength of the US agreement may have more to do with the UAE's preexisting concerns about nuclear safety and security than with Washington's ability to drive a hard bargain.

In contrast, Russia's agreements are distributed across the four quadrants. This indicates that Moscow is willing to enter into nuclear cooperation agreements with states that present a wide range of nuclear theft risks, as well as that Russia alters the terms of cooperation significantly from state to state. In fact, most of Russia's agreements are with states that have weaker than average controls against nuclear theft, as indicated by the red points to the left of the vertical axis. However, in the majority of these cases, Russia has been able to negotiate and sign cooperation agreements with above-average controls against nuclear proliferation, which is indicated by the agreements in the top left quadrant. This suggests that Russia is tailoring the terms that it is willing to offer in its cooperation agreements to the particular risks presented by individual states. This matching of stronger cooperation agreements to states with weaker existing controls provides Russia—and by extension the international community—additional assurances against proliferation for any cooperation projects that Russia pursues with that state.[33]

[33] This also may have a positive security spillover by precipitating a broader set of improvements in the nuclear infrastructure and controls in the partner state. There is preliminary evidence that this has occurred in such cases as Sudan, Bolivia, and Ethiopia, as the size of each state's marker indicates significant year-over-year improvements in the nuclear theft score for each.

Russia also has in place agreements with Iran and Egypt, states with lower-than-average nuclear security controls that often appear on experts' lists of would-be proliferators. It is not obvious that Russia's nuclear cooperation with these states has reduced these international concerns. However, the existence of these cooperation agreements, as well as the monitoring structures that Russia includes as a condition of cooperation, gives Moscow an ongoing level of engagement with and potential influence over each state's nuclear policies that the United States does not enjoy.

Overall, this more rigorous empirical assessment of the landscape of contemporary Russian and US bilateral nuclear cooperation reveals convergence on the ends desired but divergence on the means for improving the global nuclear security regime centered on NPT Article IV, which affirms the right of all states to access and use nuclear technology for peaceful purposes, and the IAEA's monitoring and safeguards. The United States seemingly regards these means as best accomplished by "change from without"—that is, by supplier states increasing the stringency of the restrictions that their customers must accept if they wish to benefit from a supplier's nuclear technology, experience, and material. This is consistent with the approach that the United States employed successfully during the emergence and maturation of the global commercial nuclear industry. However, it presents a key challenge for the United States with any ebbing of international influence, including that associated with the decline in commercial stature of the US nuclear industry. Washington must attempt to coerce or bargain with other suppliers, such as Russia, while playing an increasingly weak hand. The nature of Russia's framework agreements, in contrast, seems to convey a preferred approach for "change from within"—that is, to reduce nuclear security risks over time by collaborating closely on projects with its customers. Moscow has shown that it will impose stringent restrictions on its customers' behaviors when it can but that it can be more flexible when required. It is seemingly confident that it can help shape a partner's behavior—and manage nuclear security risks—through the ongoing joint monitoring and management structures embedded in all Russian bilateral nuclear cooperation agreements.

Implications for Future US-Russian Alignment

This chapter's systematic comparison of bilateral nuclear cooperation framework agreements reveals a distinct empirical trend: the early post-Soviet gap in "quality" of nonproliferation restrictions embedded in US and Russian nuclear agreements with customer states has significantly narrowed since 2008, especially in emerging markets. Although important differences in the character of nuclear trade persist, the qualitative restrictions reflected in both US and Russian umbrella agreements have largely been complementary. In practice, the tacit understanding of shared nonproliferation objectives in the nuclear security sphere has both narrowed the risks associated with commercial supply to diverse customer states and highlighted a set of outstanding problem cases involving international nuclear safeguards. This counterintuitive finding of tacit understanding and convergent nuclear security practices between the United States and Russian suggests the possibility of more targeted cooperation to address the especially challenging nuclear aspirants, which are disinclined to accept enhanced safeguards.

Our finding that the US and Russian approaches to nuclear framework agreements tend to be more complementary than often assumed presents an opportunity to take steps to deepen the tacit understanding, which currently appears to be premised on only the most general expectations that each side will uphold international nonproliferation commitments. It would be opportune, for example, for Moscow and Washington to initiate a regular joint dialogue to clarify approaches to implementation of nuclear security and safeguards commitments regarding nuclear commerce. The agenda could be tailored to the specific nuclear security and safeguards challenges presented by "problem" recipient states. Rather than engaging in ad hoc critiques of each other's posture, Washington and Moscow could regularly explore the broader landscape of customer states, as well as points of convergence and complementarity regarding restrictions that each may consider applying to the nonoverlapping portions of their customer portfolios. Such action can provide an important first step toward building each side's confidence in the other's commitment to strengthening nonproliferation, notwithstanding different commercial strategies and approaches to nonproliferation trade controls.

As the comparative analysis reveals, each country's approach to balancing nuclear security and commerce creates gaps in the safeguards against proliferation that it has in place. Russia and the United States face a common problem of legacy cooperation agreements that were ratified before or immediately after the end of the Cold War and that contain relatively weak nonproliferation restrictions. These legacy agreements have not kept pace with the evolving challenges presented by key customers. With a focus on the specific risks presented by customers, Russia and the United States can gain more by accepting each other's efforts at targeting enhanced nuclear security and safeguards measures on states of mutual concern—such as Myanmar, Egypt, Saudi Arabia, and Vietnam—than from inflating the security threats associated with nuclear cooperation agreements less stringent than the gold standard. Because the Russian and US industries engage mostly different customers, both states stand to gain from encouraging the other's steady improvement of prudent export control measures. This is especially the case in Russia's dealings with nuclear aspirant states such as Syria, Myanmar, and Mongolia. These states are not focal points for the US nuclear industry but pose significant risks involving nuclear material theft, trafficking, and transshipment.

To be sure, there are limitations on what one should expect from a tacit US-Russian understanding on nonproliferation export controls and international safeguards. For example, convergent US and Russian nuclear export policies face a common set of problem cases. This set includes states such as Argentina, Brazil, and Egypt that have refused to sign the AP due to their perception that nuclear-weapon states have not made sufficient progress towards disarmament, as required by Article VI of the NPT.[34] Moreover, neither nuclear supplier's approach has succeeded in moving Riyadh to upgrade Saudi national nuclear security practices so that they are commensurate with its commercial ambitions and in alignment with the terms of the SQP it concluded with the IAEA. Accordingly, the strategic challenge for greater US-Russian coordination in nonproliferation export controls rests with making reciprocity more explicit than can be achieved by

[34] NTI, "Argentina," updated April 2015, https://www.nti.org/learn/countries/argentina/; NTI, "Brazil," updated July 2015, https://www.nti.org/learn/countries/brazil/; NTI, "Egypt," updated September 2015, https://www.nti.org/learn/countries/egypt/.

general self-restraint, while avoiding the perception of a condominium that could alienate customers and rival suppliers alike. In this respect, the United States and Russia have a shared interest in encouraging nuclear recipient states to accept the AP as a condition for bilateral nuclear trade. Moscow and Washington also have a common interest in securing support for this approach and other prudent best practices from the relatively small number of other nuclear suppliers.

A case in point involves the opacity surrounding China's recent uranium milling and fuel cycle transactions with Saudi Arabia. This lack of transparency and uncertainty regarding the nature of Beijing's requirements for nuclear recipients underscores the potential detrimental commercial and nonproliferation effects for both Russia and the United States if potential customers can exploit the differences in nonproliferation controls among supplier states. Recognition by Moscow and Washington of shared interests in this domain, therefore, can hopefully prompt parallel action to expand coordination on nuclear export and safeguards policies in a variety of forums, including within the IAEA and NSG. Such action could have the beneficial effect of reducing nuclear export loopholes, tightening implementation plans for individual states, standardizing the state evaluation process, and strengthening initiatives to make adoption of the AP by recipient states a condition for export by nuclear suppliers.[35]

Finally, Moscow and Washington should be encouraged to leverage their tacit understanding in the nuclear export sphere to tackle additional safeguards challenges posed by potentially disruptive emerging nuclear technologies. These technologies—which include utilization technologies such as small modular reactors and operational technologies such as artificial intelligence—could reduce the cost associated with the current generation of nuclear power generation and improve the effectiveness of safeguards and monitoring systems. However, these emerging technologies face technical and strategic uncertainties, and they also create challenges for the present system of nuclear export controls.[36] The United States and Russia share an

35 NTI and CENESS, *Future of IAEA Safeguards.*

36 IAEA, *Emerging Technologies Workshop Report: Insights and Actionable Ideas for Key Safeguards Challenges* Vienna, 2020, https://www.iaea.org/sites/default/files/20/06/emerging-tehnologies-workshop-290120.pdf.

interest in developing a coordinated strategy to address these challenges, and the potential for such a coordinated approach is enhanced by the fact that neither Washington or Moscow has an unambiguous commercial advantage in emerging nuclear technologies. This presents an opportunity for the United States and Russia to move beyond tacit coordination and explore more explicit and holistic forms of cooperation on issues where US and Russian interests are aligned. If successful, such explicit coordination would help both states to continue to prosper commercially in the international nuclear sphere while reinforcing best practices in nuclear exports, safeguards, and nonproliferation.

Appendix: Scoring Criteria for Assessing Nonproliferation Restriction Quality of Agreements

For the purposes of coding, we identified key contractual terms that commonly appear in the Russian or US agreements and whose presence and quality could affect proliferation risk. We classified these terms into five broad areas:

- **Safeguards (SG)**—Requirements to have in force safeguards agreements with the IAEA.
- **Transfers (TF)**—Limitations placed on direct transfers of special nuclear material, sensitive fuel cycle technology, and dual-use materials, equipment, and knowledge.
- **Enrichment (EN)**—Restrictions placed on the sensitive fuel cycle activities of uranium enrichment in general, as well as specific restrictions placed on the creation of highly enriched uranium.
- **Reprocessing (RP)**—Restrictions placed on the sensitive fuel cycle activities associated with the alteration in form or content of spent nuclear fuel, including reprocessing activities that can be used to isolate weapon-grade fissionable materials such as plutonium.
- **Retransfers (RT)**—restrictions and other conditions established to prevent the subsequent transfers of materials, suppliers, equipment, and knowledge acquired by the recipient state under the cooperation agreement to other states not party to the agreement.

To capture the variations that exist in the contractual terms associated with each of these areas, we created one or more "area variables" and developed an ordinal categorical scale and coding guidelines for each. For example, the variable "20%+ U-235 Enrichment Restrictions" captured differences in the restrictions on the enrichment of uranium to greater than 20 percent concentrations of the U-235 isotope that the partner state promised to agree to by signing the cooperation agreement with the United States or Russia. The scale values and coding guidelines for this variable are as follows:

Table 1: Variable Scoring Example - Score Area: Enrichment, Variable: 20%+ U-235 Enrichment Restrictions

"20%+ U-235 Enrichment Restrictions": Scale Values ('Score')	Coding Guidelines for Scale Value
0	20%+ enrichment not mentioned in agreement
1	Agreement explicitly allows partner state to enrich uranium to 20%+ concentration of U-235
2	Partner state may produce 20%+ enriched uranium with prior written approval from the state supplying the uranium or equipment used in enrichment process
3	Partner state prohibited from producing 20%+ enriched uranium unless the source and partners state conclude an amendment to the agreement that allows such enrichment explicitly
4	Partner state prohibited from producing 20%+ enriched uranium using any materials, supplies, equipment, or knowledge provided by the source state to the partner
5	Partner state prohibited from producing 20%+ enriched uranium for the duration of the cooperation agreement with the source state

Three researchers independently reviewed and scored each cooperation agreement, then discussed and came to consensus for any variables with conflicting scores. The team then reviewed the entire dataset to ensure that the scoring rubric for each variable had been applied consistently across all agreements. To calculate a single score to represent the nonproliferation "quality" of each area's terms, we first expressed each raw variable score as a "variable fractional score," or percentage of the total score possible for that variable. We calculated an equally weighted average of these fractional

scores, an "area fractional score," which we then rescaled to a 0-100 scale for use as the "area score." The "nonproliferation strength" score is the equally weighted average of these five area scores for each agreement. We calculated the "portfolio nonproliferation strength" score for Russia and for the United States by averaging the nonproliferation strength scores for all agreements that were in force during a given year—the agreements that had been ratified by each party to the agreement and not yet expired—for each country during each of our analysis.

CHAPTER FOUR

Cooperating Unilaterally: The 1991-1992 Presidential Nuclear Initiatives

Jeremy Faust

When US President George H.W. Bush and Soviet President Mikhail Gorbachev signed the US-Soviet Strategic Arms Reduction Treaty (START I) on July 31, 1991, it marked the culmination of nine years of bilateral arms control negotiations. The negotiations, which launched in May 1982, proceeded unevenly, interspersed with disputes over intermediate-range missiles in Europe, the proposed Strategic Defense Initiative (SDI), and the crises of 1983.[1] With START I, the erstwhile Cold War rivals agreed on an intrusive verification regime whose protocols and memorandum of understanding contribute to "probably the longest treaty in history."[2] While the treaty's exacting verification provisions facilitated strategic stability by providing transparency and common definitions, the evolving chain of events that marked the end of the Cold War soon made its aggregate limits obsolete. Moreover, political crises in the Soviet Union reoriented nuclear threat perceptions in the United States. Driven by fears that Soviet tactical nuclear weapons could fall into unauthorized hands, Bush announced a series of unilateral reductions and redeployments of US nuclear weapons in the fall of 1991 and invited Gorbachev to reciprocate. Gorbachev's reciprocal actions and subsequent unilateral actions by Bush and President Boris Yeltsin of Russia became known as the Presidential Nuclear Initiatives (PNIs). The PNIs show the importance of cooperating unilaterally during a crisis, when rapidly evolving events preclude the possibility of formal negotiations.

[1] David E. Hoffman, "1983: Turning Point of the Cold War," *Security Index* Vol. 13, No. 1 (2007), http://www.pircenter.org/media/content/files/0/13413286351.pdf.
[2] Nikloai Sokov, "START I," Nuclear Threat Initiative, March 3, 2010, https://www.nti.org/analysis/articles/start-one/.

Despite resulting in "perhaps 17,000 [tactical nuclear weapons] being withdrawn from service," scholars have largely overlooked the PNIs as a model for further nuclear arms reductions or as a means for achieving strategic stability.[3] Compared to negotiated agreements, unilateral disarmament measures such as the PNIs lack intrusive verification, which causes many scholars and officials to dismiss them as an inferior alternative to formal treaties. In an era when further progress on negotiated nuclear arms limitations has proven elusive due to domestic political opposition in the US Congress[4] and heightened bilateral tensions between the United States and Russia, a reexamination of the PNIs may provide an impetus for policy makers to reapproach thorny issues, such as limitations on remaining tactical nuclear weapons. In contrast to the 1990s, scores of open-source researchers analyzing publicly available satellite imagery may now aid in providing verification of unilateral pledges of nuclear arms redeployments and reductions. The PNIs therefore may be better understood as a complementary framework to negotiated arms control treaties, rather than "an alternative paradigm for arms control."[5]

Former US nuclear arms control official Susan J. Koch offers the most comprehensive account of the PNIs in her case study prepared for the National Defense University.[6] Koch's case study examines the domestic factors and bureaucratic process in the United States that facilitated Bush's decision to undertake what would later be known as the PNIs. Less well examined are the domestic political factors in the Soviet Union, and later Russia, that provided Bush with willing partners in Gorbachev and Yeltsin. This chapter explores these motivations and examines how existing arms control treaties and the negotiations that led to them provided the transparency, familiarity,

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[3] Eli Corin, "Presidential Nuclear Initiatives: An Alternative Paradigm for Arms Control," March 1, 2004, https://www.nti.org/analysis/articles/presidential-nuclear-initiatives/.

[4] See Tom Z. Collina, "Senate Approves New START," *Arms Control Today,* January/February 2011, https://www.armscontrol.org/act/2011-01/senate-approves-new-start for a recounting of the Senate debate over ratification of the New Strategic Arms Reduction Treaty. As evidenced in the debate then, Republicans in Congress have reiterated an insistence on including tactical nuclear weapons in any follow-on treaty to that treaty.

[5] Corin, "Presidential Nuclear Initiatives."

[6] Susan J. Koch, "The Presidential Nuclear Initiatives of 1991-1992," Case Study 5 (Washington, DC: National Defense University, September 2012), https://ndupress.ndu.edu/Portals/68/Documents/casestudies/CSWMD_CaseStudy-5.pdf.

and personal trust necessary to undertake reciprocal, coordinated arms reductions as the Cold War wound to a close amid constant political change at the international level.

Political Instability in the Soviet Union and the Problem of "Loose Nukes"

On August 17, 1991, the State Committee on the State of Emergency, led by senior Soviet officials—including the head of the KGB and the minister of defense—cut off Gorbachev's communications at his dacha in Foros, Crimea, in preparation for a coup attempt.[7] As the plotters launched the coup on the morning of August 19, Minister of Defense Dmitri Yazov discovered that Gorbachev's portable nuclear launch control system remained with him in Foros and ordered its removal to Moscow. For approximately three days, Gorbachev lost access to his "nuclear suitcase," while military leaders gained control over the Soviet Union's nuclear command-and-control system. After the defeat of the coup plotters on August 21, driven in part by Yeltsin's dramatic stand atop a tank outside the Russian parliament building, Gorbachev regained control of the Soviet Union's nuclear deterrent. Although control over nuclear weapons during the coup did not receive much attention within the Soviet Union, the political instability raised concerns regarding Soviet command and control in Washington and other foreign capitals.[8]

Beyond these concerns, the August 1991 coup attempt complicated the prospect of further arms control negotiations in the immediate term, as Yeltsin's rising power reduced the reliability of Gorbachev as a negotiating partner. During the attempted coup, Yeltsin personally reported on events to Bush as they unfolded while Gorbachev remained cut off from all communications. The transcripts of these calls reflect a changing dynamic in relations, with Bush treating Yeltsin as a leader of comparable stature to Gorbachev, previously the preferred US negotiating partner.[9] In addition to these changing dynamics, the difficulty of defining, accounting for, and

[7] Nikolai Sokov, "Controlling Soviet/Russian Nuclear Weapons in Times of Instability," in Henry D. Sokolski and Bruno Tertrais, eds., *Nuclear Weapons Security Crises: What Does History Teach?* (Carlisle, PA: Strategic Studies Institute, US Army War College, 2013), pp. 98-101, http://www.npolicy.org/books/Security_Crises/Full_Book.pdf.
[8] Sokov, "Controlling Soviet/Russian Nuclear Weapons," p. 98.
[9] Koch, "Presidential Nuclear Initiatives," p. 3.

placing limits on tactical nuclear weapons further reduced the utility of formal arms control negotiations. As noted by Russian arms control expert Alexei Arbatov, various aspects of tactical nuclear weapons, including the dual-purpose nature of their delivery vehicles, precluded the possibility of applying to them the existing verification techniques of strategic nuclear arms control.[10] To avoid the issue of sharing the highly sensitive information needed to verify the existence of individual nuclear warheads, arms control negotiators had worked to limit aggregate numbers of delivery vehicles in arms control treaties throughout the Cold War, including during the Strategic Arms Limitations Talks and negotiations for the Intermediate-Range Nuclear Forces Treaty and START I. As concerns regarding control over Soviet nuclear weapons heightened in Washington in the fall of 1991, existing arms control frameworks did not offer a timely policy response to unfolding events.

Within two weeks of the August coup attempt, US national security adviser Brent Scowcroft suggested the reduction of tactical nuclear weapons to Bush over the Labor Day holiday.[11] Three days later, at a National Security Council (NSC) meeting on September 5, Bush instructed senior defense officials to develop proposals on the reduction of nuclear arms. According to Robert Gates, who was deputy national security adviser at the time, Bush sought to signal a positive reaction to the changing security environment while also achieving cost savings in military deployments.[12] Despite previous opposition to reductions from Secretary of Defense Richard Cheney, Chairman of the Joint Chiefs of Staff Colin Powell relayed the president's instructions to the Joint Staff shortly after the NSC meeting and requested a list of potential unilateral actions.[13] On September 6, Air Force Brigadier General Gary Curtin, previously the Joint Chiefs of Staff representative to the START negotiations, in turn relayed these instructions to service branch officials, who had to overcome their predisposition to use a "traditional arms control

10 Alexei Arbatov, "A Russian Perspective on the Challenge of U.S., NATO, and Russian Non-Strategic Nuclear Weapons," in Steve Andreasen and Isabelle Williams, eds., Reducing Nuclear Risks in Europe (Washington, DC: Nuclear Threat Initiative, 2011), https://media.nti.org/pdfs/NTI_Framework_full_report.pdf, p. 156.
11 Koch, "Presidential Nuclear Initiatives," p. 4.
12 Koch, p. 4.
13 Koch, p. 7.

approach to task."[14] Within days, Curtin forwarded proposals to Powell for a wide-ranging list of potential measures.

Outside of government, leading national security experts, unaware of developments within the NSC and Joint Staff, also expressed concern over controls of Soviet tactical nuclear weapons. On September 6, Graham Allison, a professor at the Harvard Kennedy School, sent a seven-page private memo to Powell entitled "Sounding an Alarm: Soviet Disunion and Threats to American National Security."[15] In the memo, Allison expressed concern that the potential dissolution of the Soviet Union could result in the "rapid disintegration of Soviet military forces including the nuclear arsenal."[16] Basing this assessment on discussions with senior advisers to Gorbachev and Yeltsin, Allison argued that the fragmentation of Soviet military forces posed two nuclear threats: the division of the Soviet strategic arsenal among Russia, Ukraine, Belarus, and Kazakhstan and the potential for conflict over "non-strategic nuclear weapons depots in assorted other republics."[17] To address the latter threat, Allison proposed that the United States make "parallel unilateral announcements" regarding nonstrategic nuclear weapon deployments and explore "cooperative measures with the Soviet and Russian government to return all nuclear warheads to Russian territory immediately."[18] Although the memo coincided with Powell's development of a unilateral package of measures for Bush, it did not arrive quickly enough to have influence on the formulation of the PNIs, given the speed at which the Joint Staff developed options for tactical nuclear weapon reductions.[19] Although the memo apparently did not contribute to their formulation, Allison's suggestion for "parallel unilateral announcements" closely mirrors the reciprocal nature of the PNIs in their final form. His other suggestions regarding cooperative

14 Koch, p. 7-8.

15 Graham Allison, "Sounding an Alarm: Soviet Disunion and Threats to American National Security" September 6, 1991, reprinted as "Appendix: Graham Allison's Memo to Colin Powell" in Graham Allison, "What Happened to the Soviet Superpower's Nuclear Arsenal? Clues for the Nuclear Security Summit," Belfer Center for Science and International Affairs, Harvard Kennedy School, March 2012, https://www.belfercenter.org/sites/default/files/legacy/files/3%2014%2012%20Final%20What%20Happened%20to%20Soviet%20Arsenals.pdf.

16 Allison, "Sounding an Alarm," p. 1.

17 Allison, p. 2.

18 Allison, p. 4.

19 Susan J. Koch, email message to author, February 18, 2021.

measures with the Soviet Union would eventually contribute to the development of the Cooperative Threat Reduction program, albeit through the legislative branch.

Likely unbeknownst to Allison and US officials, the Soviet Union had already completed the consolidation of all nuclear weapons within Russia, Ukraine, Belarus, and Kazakhstan by the spring of 1991.[20] Prompted by the attempted capture of tactical nuclear weapons in Baku by the Popular Front of Azerbaijan in 1990, the Soviet military conducted a "massive" withdrawal of Soviet tactical nuclear weapons "in almost complete secrecy" over the course of 1990 and early 1991.[21] Rumors from Baku, or rumors of similar events elsewhere in the Soviet Union, likely drove concerns among the Gorbachev and Yeltsin advisers who consulted with Allison. Given the degree of secrecy surrounding the consolidation of Soviet tactical nuclear weapons, Allison's contacts likely remained unaware of their withdrawal from the peripheral Soviet republics, or at the very least, these officials did not share knowledge of the withdrawal with Allison. General Mikhail Moiseyev, the Soviet chief of staff, would later confirm the withdrawal of nuclear warheads "from areas threatened by nationalist uprisings" to Powell during his visit to the United States in November 1991.[22]

In any event, officials in Washington likely proceeded under the assumption that tactical nuclear weapons remained at risk in Soviet republics other than Russia, Ukraine, Belarus, and Kazakhstan. As the Department of Defense refined proposals for unilateral arms control reductions, the final form of what became known as the PNIs took shape. According to Koch's account, Powell relayed Curtin's proposals to Cheney, who in turn sent them to his policy staff.[23] The staff largely accepted Curtin's proposals, albeit with two key differences. First, they called for placing some of the removed warheads in storage, which would allow for reversibility on short notice. Second, they suggested that the United States issue a "challenge" to the Soviet Union to

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20 Sokov, "Controlling Soviet/Russian Nuclear Weapons," p. 96.
21 Sokov, p. 96.
22 Colin L. Powell, "Visit of General Moiseyev to the United States," November 1, 1990, Digital National Security Archive collection: Soviet-U.S. Relations, 1985-1991, George Washington University.
23 Koch, "Presidential Nuclear Initiatives," p. 8.

take reciprocal unilateral actions.[24] With these changes, the first PNI proposal reached its final form, which Bush relayed to Gorbachev just hours before his announcement of the measures in a national address.

A Proposal for Reciprocal Unilateral Nuclear Reductions

On the morning of September 27, 1991, Bush called Gorbachev to alert him that he would publicly announce unilateral nuclear weapon reductions and call for reciprocal Soviet steps, as outlined to Gorbachev in a letter dated September 26.[25] According to the transcript of the call, Gorbachev responded positively to the proposal in general but requested that the United States provide greater detail.[26] He also inquired whether the reductions would affect strategic nuclear naval forces—a major priority of Gorbachev at the 1989 Malta Summit—and whether the United States had changed its views on a nuclear test moratorium, which had long inhibited progress toward the conclusion of a Comprehensive Nuclear-Test-Ban Treaty (CTBT).[27] Bush indicated that the US position on testing remained unchanged and that the reductions would not affect naval strategic forces. Finally, he assured Gorbachev that his national address that evening would further clarify the US proposal. During their conversation, Gorbachev and Bush agreed that they could either set up strategic stability talks or employ existing military-to-military communication channels.[28]

According to Anatoly Chernyaev, one of Gorbachev's foreign policy advisers, Soviet military leaders expressed skepticism regarding Bush's proposal, which

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[24] Koch, p. 8.

[25] "Unilateral U.S. Nuclear Pullback in 1991 Matched by Rapid Soviet Cuts," National Security Archive, George Washington University, September 30, 2016, https://nsarchive.gwu.edu/briefing-book/nuclear-vault-russia-programs/2016-09-30/unilateral-us-nuclear-pullback-1991-matched.

[26] White House, "Telcon with Mikhail Gorbachev, President of the USSR," September 27, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117094-Document-01-White-House-Memorandum-of-Telephone, p. 2 (hereafter cited as "Bush-Gorbachev September 27 telephone call").

[27] Bush-Gorbachev September 27 telephone call, p. 2.

[28] Bush-Gorbachev September 27 telephone call, p. 3.

they viewed as an attempt to "deceive or humiliate" the Soviet Union.[29] In his diary entry for September 27, Chernyaev chastises Soviet Chief of General Staff Vladimir Lobov and Deputy Foreign Minister Viktor Karpov for their "outdated" views, which he associated with "years of nonsense in Geneva and Vienna."[30] Chernyaev complained that the Soviet Union lacked "politician-generals" who could keep up with evolving political dynamics but described Yevgeny Shaposhnikov, the last Soviet minister of defense, as "smarter, more modern, and more politically aware" than other generals.[31] Chernyaev indicates that Shaposhnikov developed talking points for Gorbachev similar to his own, while Lobov, who remained in the room during Gorbachev's call with Bush, continued to express opposition to reciprocation.

At 8:00 p.m. on September 27, Bush delivered an Oval Office address during which he outlined his proposals for unilateral reductions of nonstrategic nuclear weapons and suggested reciprocal actions that the Soviet Union could take. Regarding tactical nuclear weapons, which he referred to as "theater nuclear weapons," Bush noted that in 1990, he had canceled plans to modernize ground-launched tactical nuclear weapons and that NATO had proposed the mutual elimination of all nuclear artillery shells in Europe pending the start of negotiations on further nuclear arms reductions with the Soviet Union. Contrasting the typically slow pace of arms control negotiations with the rapidly improving security environment, Bush announced that the United States would eliminate its entire inventory of ground-launched tactical nuclear weapons while maintaining tactical nuclear gravity bombs in Europe.[32] Bush proposed that the Soviet Union join the United States in eliminating all ground-launched tactical nuclear weapons, including systems that the United States had already eliminated. Regarding naval forces, Bush announced the withdrawal of all tactical nuclear weapons

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[29] Excerpt from Anatoly S. Chernyaev diary, September 27, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117095-Document-02-Excerpt-from-Anatoly-S-Chernyaev (hereafter cited as "Chernyaev September 27 diary entry").

[30] Chernyaev September 27 diary entry.

[31] Chernyaev September 27 diary entry.

[32] Text of announcement of Presidential Nuclear Initiative by President George H.W. Bush, September 27, 1991 (hereafter cited as "Bush PNI address"), reprinted in Koch, "Presidential Nuclear Initiatives," pp. 23-28.

from surface ships, attack submarines, and land-based naval aircraft. Bush explicitly noted that the United States would withdraw "nuclear Tomahawk missiles," a proposal previously rebuffed by the US Navy when raised by the Soviet Union at the Malta Summit.[33] In contrast to the complete elimination of ground-launched tactical nuclear weapons, Bush noted that "many of these land and sea-based warheads will be dismantled and destroyed," while leaving the remainder in central storage.[34] Again, Bush called for parallel Soviet measures on tactical naval nuclear forces.

In addition to the proposals on tactical nuclear weapons, Bush announced a series of unilateral measures in the area of strategic forces and called for bilateral cooperation in the areas of nuclear safety, nuclear security, dismantlement of nuclear weapons, and improvement in nuclear command and control. Regarding strategic forces, Bush announced that the United States would take strategic bombers off alert, remove intercontinental ballistic missiles (ICBMs) slated for deactivation under START I ahead of schedule, end the development of a mobile ICBM, cancel the development of a short-range air-launched strategic missile, and "streamline its command and control procedures."[35] Bush proposed that the Soviet Union reciprocate by returning its mobile ICBM force to bases and accelerating elimination of ICBMs under START I. Finally, Bush called for a bilateral agreement to remove multiple independently targetable reentry vehicles (MIRVs) from ICBMs and joint steps to allow for the limited deployment of nonnuclear ballistic missile defense systems.

The following day, September 28, Cheney issued a memorandum to Powell, the secretaries of the military branches, and the undersecretaries of defense to execute the president's orders.[36] Another implementing document, an undated telegram from the chairman of the Joint Chiefs of Staff, stresses that in reducing the US nuclear arsenal, Bush intended to "move … in the direction of increased stability and reduced risk of war," while maintaining

33 Bush PNI address.
34 Bush PNI address.
35 Bush PNI address.
36 Richard Cheney, "Reducing the United States Nuclear Arsenal," September 28, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117096-Document-03-Department-of-Defense-Secretary-of.

support for "reformist elements" in the Soviet Union and its republics.[37] The telegram also makes clear that Bush had no plans to replace nuclear deterrence as "a cornerstone of U.S. policy," stressing that the United States would continue to modernize remaining nuclear forces, retain tactical nuclear gravity bombs in Europe, and retain the ability to redeploy sea-based Tomahawk tactical nuclear weapons.[38]

In a televised address on October 5, 1991, Gorbachev responded to Bush's initiative with proposals of his own.[39] With regard to tactical nuclear weapons, Gorbachev announced that the Soviet Union would eliminate all of its tactical nuclear artillery, tactical rockets, and nuclear land mines while eliminating a portion of its warheads for nuclear air defense and placing the remainder in central storage. Regarding naval forces, he matched the US proposal for withdrawals and partial elimination. Gorbachev proposed that each side take further steps to eliminate all tactical nuclear weapons based on surface ships and submarines and to withdraw all air-launched tactical nuclear weapons to central storage. With regard to strategic nuclear forces, Gorbachev announced measures to implement some of Bush's proposals, including those related to mobile ICBMs, strategic bombers, accelerated elimination of ICBMs under START I, and command and control. Additionally, he announced cancellation of various modernization programs, further reductions in strategic warheads, and the cessation of nuclear testing for one year. Finally, he proposed that the United States and Soviet Union convene a new summit to further discuss their evolving relationship. Just as Bush had done on September 27, Gorbachev privately informed his counterpart of the proposals prior to the public address.[40]

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37 Chairman of the Joint Chiefs of Staff, "Nuclear Force Initiatives," September 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117097-Document-04-Chairman-of-the-Joint-Chiefs-of.

38 Chairman of the Joint Chiefs of Staff, "Nuclear Force Initiatives," pp. 3, 6.

39 Translation of televised announcement by President Mikhail Gorbachev, October 5, 1991, reprinted in Stockholm International Peace Research Institute, *SIPRI Yearbook 1992: World Armaments and Disarmament* (Oxford: Oxford University Press, 1992), https://www.sipri.org/sites/default/files/SIPRI%20Yearbook%201992.pdf, pp. 87–88.

40 White House, "Telcon with Mikhail Gorbachev, President of the Union of Soviet Socialist Republics," October 5, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117098-Document-05-White-House-Memorandum-of-Telephone (hereafter cited as "Bush-Gorbachev October 5 telephone call").

In his diary entry dated October 6, Chernyaev notes that Soviet officials worked to ensure that Gorbachev's address aired before US Undersecretary of State Reginald Bartholomew met with Soviet counterparts in Moscow to avoid any appearance of the Soviets acting "at the Americans' bidding."[41] Chernyaev does not make clear which audience Soviet officials tried to placate with the timing of Gorbachev's speech. Based on his earlier entry, this may have referred to certain Soviet military leaders opposed to further nuclear arms reductions, as opposed to the wider public. Chernyaev's comment about the optics of the PNIs proved prescient, considering the subsequent politicization of Russia's tactical nuclear weapons over the two decades following the PNIs. As noted in a 2009 analysis, "the Russian government attitude toward [tactical nuclear weapons] appears to represent a complex mix of domestic and bureaucratic politics, (mis)perceptions, and idiosyncrasies."[42] The analysis attributes this politicization in part to the perception among some domestic and bureaucratic actors in Russia that the PNIs and associated arms control measures included "excessive, unreciprocated concessions."[43] Indeed, in the decade following the announcement of the PNIs, ascendant conservative and nationalist currents within Russia would give rise to an increasingly negative view of Gorbachev's record, driven by the perception of repeated slights by the United States including NATO expansion and the bombing of Serbia in 1999.

Implementing Reciprocal Commitments: Bilateral Consultation

One day after Gorbachev's address, US and Soviet officials met in Moscow, led by Bartholomew and Deputy Foreign Minister Alexei Obukhov. These consultations would continue for several days, revealing the potential as well as the limitations of reciprocal unilateral measures. During these deliberations, each side sought clarification of the broad measures announced by Bush and Gorbachev while also probing for the other side's

[41] Excerpt from Anatoly S. Chernyaev diary, October 6, 1991, George Washington University National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117099-Document-06-Excerpt-from-Anatoly-S-Chernyaev.
[42] Miles A. Pomper, William Potter, and Nikolai Sokov, "Reducing and Regulating Tactical (Nonstrategic) Nuclear Weapons in Europe" (Monterey, CA: James Martin Center for Nonproliferation Studies, December 2009), https://www.files.ethz.ch/isn/116401/2009-12-tnw_europe.pdf, p. 16.
[43] Pomper, Potter, and Sokov, "Reducing and Regulating."

stances on issues that would require further negotiation, such as tactical nuclear weapons in Europe and "de-MIRVing," or removing MIRVs from ICBMs and replacing them with single warheads.[44] The two sides confirmed that the PNIs would result in the elimination of all ground-launched nuclear weapons with ranges shorter than that of ICBMs. They also agreed to inform each other on a regular basis regarding the deactivation and destruction of the eliminated weapons. Soviet officials at the consultations pressed their US counterparts on the elimination of all, rather than "many," submarine- and ship-based tactical nuclear weapons and the withdrawal to central storage of all air-launched tactical nuclear weapons, which would have included weapons used for NATO nuclear sharing. When presented with the Soviet proposals, Bartholomew expressed personal interest in them but cautioned that US defense officials would likely remain unreceptive. Soviet officials likewise pushed back on US attempts to negotiate MIRVs, noting that banning them would result in a strategic imbalance in favor of the United States.

Other records, including US diplomatic cables and transcripts of discussions recorded by each side, show the increasingly complex environment surrounding the consultations. A diplomatic cable from the US embassy in Moscow to Secretary of State James Baker dated October 9 reveals these complexities.[45] The cable recounts a meeting between Bartholomew and representatives of the Soviet republics of Russia, Ukraine, Belarus, and Kazakhstan. In the meeting, Bartholomew stressed that the United States prefers negotiating arms control issues with the central Soviet authorities, rather than with the republics. In this regard, he warned that the United States would not look favorably upon the republics if they sought to "assert

[44] "[Soviet] Record of the Main Content of Consultations between A.A. Obukhov and R. Bartholomew" (excerpts), October 6, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117124-Document-07-Record-of-the-Main-Content-of (hereafter cited as "Obukhov-Bartholomew Consultations").

[45] "Undersecretary Bartholomew's Discussions with Representatives of Soviet Republics" (cable from the US Embassy in Moscow to Secretary of State Baker), October 7, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117104-Document-08-Cable-from-American-Embassy-in (hereafter cited as "Bartholomew's Discussions").

control over nuclear weapons."[46] Noting that the August 19 coup attempt encouraged Bush to launch the PNIs, Bartholomew stressed that the initiatives sought to support "reformist elements in the republics and the central government."[47] In response to Bartholomew, Andrey Kolosovsky, then a deputy minister of foreign affairs for the Russian Soviet Republic, expressed understanding for the US desire to limit negotiations to two parties but also stressed that negotiations could only succeed with the involvement of the republics. He further expressed admiration for the PNIs, noting that they could build "political confidence between the two countries," while bringing benefits to each side "from both the strategic and the economic point of view."[48] Kolosovsky's comments show that for political leaders in the Soviet Union, economic savings provided as much of an impetus for the parallel reductions as security considerations did.

Consultations between Assistant Secretary of Defense Stephen Hadley and Deputy Foreign Minister Obukhov illustrate how the PNIs accelerated momentum on discussing outstanding strategic issues, including the US priority to reach a de-MIRVing agreement. While recognizing that any agreement would take further negotiations, both sides recognized the importance of holding a frank, informal exchange of views before completing START I reductions, which could lock each side into destabilizing force structures. Obukhov's remarks provide further evidence that economic considerations played an important role in driving the Soviet Union to support the PNIs, as he noted that the "final goal should be stability at a low economic price."[49] Additionally, Obukhov warned Hadley that "the Soviet side would have very serious reservations about [Bush's de-MIRVing] proposal, given the historic Soviet advantage in ICBMS and the historic U.S. advantage in SLBMs."[50] In a possible reflection of this institutional opposition, Generals Fedor Ladygin and Bronsilav Omelichev, representatives

46 "Bartholomew's Discussions," p. 2.
47 "Bartholomew's Discussions," p. 1.
48 "Bartholomew's Discussions," p. 2.
49 "ASD Hadley Meeting with Soviet Deputy FM Obukhov" (cable from the US Embassy in Moscow to Secretary of State Baker), October 9, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117107-Document-11-Cable-from-American-Embassy-in, p. 2.
50 "ASD Hadley Meeting with Soviet Deputy FM Obukhov," p. 1-2.

of the Soviet General Staff and Ministry of Defense, respectively, declined to attend the meeting at the last moment.

Institutional opposition to various proposals advanced in the PNIs did not remain limited to the Soviet side. As reflected in a transcript of consultations between Bartholomew and Alexander Yakovlev, one of Gorbachev's principal political advisers, dated October 8, the Bush administration feared conservative opposition to the nuclear force reductions.[51] As recounted by Yakovlev, Bartholomew predicted that "right-wing circles in the US and other opponents of disarmament will begin a propaganda campaign against George Bush in this regard."[52] Bartholomew also mentioned continued institutional opposition to ending nuclear testing, noting that "in the US scientific and military circles the prevailing opinion is that some minimal testing is necessary to guarantee the maximum environmental safety of nuclear weapons as well as their reliability in storage."[53] A memo written by John Gordon, senior director for defense policy and arms control on the National Security Council, further reflects US institutional opposition to a halt in testing. In outlining considerations for the Soviet proposal on a year-long moratorium on nuclear testing, Gordon simply writes "(!!!!!!!!!!!!!)," reflecting the US side's rejection of the proposal out of hand.[54] This opposition would remain through the 1996 adoption of the CTBT, later contributing to the US Senate's vote against ratification of the agreement.

The PNI consultations in Moscow in early October 1991 also foreshadowed future strategic differences that would grow over time. In an October 7 meeting with Obukhov, Bartholomew made clear that the US desire to spend "less money on defense" did not mean the United States would broadly cut each military program.[55] Douglas Graham, an official with the Office of the

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51 "Main Content of the Conversation between A.N. Yakovlev and the U.S. Undersecretary of State Reginald Bartholomew," October 8, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117106-Document-10-Memorandum-of-Conversation-between-A (hereafter cited as "Yakovlev-Bartholomew Conversation").

52 "Yakovlev-Bartholomew Conversation."

53 "Yakovlev-Bartholomew Conversation," p. 2

54 John Gordon, "Nuclear Initiatives Discussion Paper," October 10, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117108-Document-12-National-Security-Council-Memo-from.

55 "Obukhov-Bartholomew Consultations," p. 8.

Secretary of Defense, further stressed that the US government planned to reallocate some funding toward tactical missile defense systems to protect against a "limited attack" facilitated by the proliferation of ballistic missile technologies. At the same time, he cautioned that the United States did not intend to share technology with the Soviet Union, instead offering only to exchange information on anti-ballistic missile (ABM) systems.[56] Over time, growing interest in missile defense capabilities would lead the United States to withdraw from the ABM Treaty in 2002, with negative implications for the bilateral US-Russian strategic relationship.

Ultimately, records of bilateral consultations in Moscow in early October reveal both the achievements of the PNIs and their limitations. Each side enthusiastically expressed support for the other's nuclear weapon reductions, agreeing that such steps would lessen the security risks associated with Soviet nuclear weapons, allow for reductions in defense spending, and contribute to further reform in the Soviet Union. Despite these mutual interests, a full-scale transformation of the strategic nuclear relationship remained out of reach due to outstanding disagreements regarding nuclear testing, tactical nuclear weapons in Europe, and missile defense. Nonetheless, the 1991 round of PNIs resulted in reciprocal pledges for drastic cuts in tactical nuclear weapons, as well as pledges to accelerate implementation of START I and cancel other strategic development programs. By late October 1991, when Bush and Gorbachev met in Madrid for a Middle East peace conference, both sides had already taken heavy bombers off alert, while the Soviet Union had relocated rail-mobile ICBMs to permanent bases.[57] These disarmament measures would shortly come into question as Gorbachev's position as president of the Soviet Union grew more tenuous, with heads of its constituent republics vying for more control.

A Second Reciprocal Proposal for a New Partner

Among the Soviet Union's constituent republics, Russia began to emerge as the leading successor, as illustrated by a memorandum on December

56 "Obukhov-Bartholomew Consultations," p. 6.

57 Excerpt from Anatoly S. Chernyaev diary, November 2, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117112-Document-16-Excerpt-from-the-Anatoly-S-Chernyaev; Koch, "Presidential Nuclear Initiatives," p. 1.

16, 1991, from Baker to Bush. In the memorandum, Baker remarks upon the changing power dynamics, noting that Yeltsin "chose to make a strong political statement by meeting me in the Kremlin" in contrast to Gorbachev's "subdued" state.[58] The structure of the memo suggests that US diplomacy had begun to recognize these developments in practice, as it recounts Baker's meeting with Yeltsin before his meeting with Gorbachev. During the meeting, Baker pushed Yeltsin to reaffirm publicly a number of the commitments Gorbachev had pledged in response to Bush's initial overture, including dialogue on nuclear weapon storage, warhead dismantlement, and de-MIRVing.[59] In seeking such reassurances, the Baker memorandum indicates that the United States wanted not only to confirm the Gorbachev PNIs with Russia but also to increase pressure on the other republics to confirm them as well. Just 10 days after Baker's meetings with Yeltsin and Gorbachev, the Soviet Union would cease to exist, leaving Bush and Yeltsin to develop the future bilateral nuclear relationship.

One month after the dissolution of the Soviet Union, Bush announced a second round of unilateral nuclear initiatives in his State of the Union address on January 28, 1992.[60] Noting the end of "imperial communism," Bush revealed an acceleration of planned cuts in military spending related to US strategic nuclear forces.[61] As part of these cuts, he announced early cancellation of weapon development programs, including B-2 bombers, replacement submarine-launched ballistic missile (SLBM) warheads, Peacekeeper missiles, and advanced cruise missiles. Additionally, he announced the cancellation of a program to develop a small ICBM. Finally, Bush offered to eliminate all Peacekeeper missiles, de-MIRV all Minuteman missiles, and reduce warheads on SLBMs by one-third if "the former Soviet Union" agreed to de-MIRV

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58 James A. Baker, "Monday's Meetings in Moscow," December 16, 1991, Bush Presidential Library, Digital National Security Archive collection: Soviet-U.S. Relations, 1985-1991, George Washington University, https://www.proquest.com/government-official-publications/mondays-meetings-moscow/docview/2157791145, p. 1.

59 Baker, "Monday's Meetings in Moscow," p. 2.

60 George H. W. Bush, State of the Union address, *Congressional Record* 102-176 (January 28, 1996), p. H108, https://webarchive.loc.gov/congressional-record/20160506153134/http://thomas.loc.gov/cgi-bin/query/F?r102:6:./temp/~r102RvAOMM:e0: (hereafter cited as "Bush SOTU").

61 Bush SOTU.

all land-based ICBMs.[62] In doing so, Bush further framed negotiations for START II, which would continue for another year.

Yeltsin responded to Bush's proposal on January 29, the very next day.[63] In his address, Yeltsin announced the end of production for various types of land-based tactical nuclear weapons, the elimination of half of Russia's nuclear warheads for air defense, and the elimination of half of Russia's air-launched tactical nuclear weapons. In the area of strategic forces, Yeltsin announced the end of production of air-launched cruise missiles (ALCMs) and strategic bombers while proposing a reciprocal renouncement of new ALCM development. Like Bush, Yeltsin sought to frame START II negotiations, proposing further strategic reductions to reach 2,000-2,500 deployed warheads on each side. As noted by Koch, Yeltsin's quick response to Bush's State of the Union address suggests a higher level of bilateral consultation on PNIs in January 1992 compared to the PNIs announced in September and October 1991. Baker's December 1991 memorandum to Bush provides further evidence for this assessment, indicating that the dissolution of the Soviet Union did not prevent informal consultations on PNIs and strategic arms negotiations from continuing into 1992. The bilateral strategic arms negotiations framed by proposals made alongside the PNIs eventually led to the signing in January 1993 of START II, which incorporated the US proposal for de-MIRVing while relying on verification measures agreed upon in START I.

Motivations for Cooperation

Despite divergent domestic political situations in late 1991, the United States and the Soviet Union had shared motivations in pursuing nuclear arms reductions under the PNIs. Both sides sought to secure Soviet nuclear weapons while also reaping the social benefits of military spending cuts. On the Soviet (later Russian) side, Presidents Gorbachev and Yeltsin used the initiatives to strengthen their respective political positions by presenting themselves as reliable US partners. In the aftermath of the August 1991

62 Bush SOTU.

63 Text of address by President Boris Yeltsin on President Nuclear Initiative, January 29, 1992 (hereafter cited as "Yeltsin PNI address"). A translation of the address is reprinted in Koch, "Presidential Nuclear Initiatives," pp. 34-39.

coup attempt, engaging in the PNIs allowed Gorbachev to remain the primary negotiating partner for the United States despite a tenuous domestic position. Later, Yeltsin reconfirmed the PNIs to present himself as a reliable negotiating partner while also ensuring that former Soviet nuclear capabilities fell exclusively under Russian control. Finally, for the United States, the PNIs offered an opportunity to assuage growing antinuclear concerns among populations in allied states, which had contributed to the end of the US-New Zealand alliance just a half decade earlier.

While efforts to consolidate and secure Soviet nuclear weapons motivated both the United States and the Soviet Union (and later Russia), the sources of concern emanated from different events. On the US side, the August 1991 coup attempt in the Soviet Union prompted Bush to take action on tactical nuclear weapons, ultimately resulting in the PNIs. On the Soviet side, political leaders and the general population did not exhibit widespread concern regarding control over nuclear weapons during the attempted coup.[64] Although attempted theft of tactical nuclear weapons in Azerbaijan by nationalists drew the concern of the Soviet military—prompting the secret withdrawal of all tactical nuclear weapons to Russia, Ukraine, Belarus, and Kazakhstan—it remains unclear to what extent political leadership had knowledge of these developments.[65] Nonetheless, the Soviet Union—aware of Western concerns regarding the security of its nuclear stockpile—prepared for negotiations on tactical nuclear weapons in the aftermath of the coup attempt.[66] As the Soviet Union neared its end in late 1991, consolidating and securing the Soviet Union's nuclear weapons provided Yeltsin the opportunity to present himself as a credible partner to the United States, ensure that Russia received recognition as the Soviet Union's primary successor state, and limit proliferation to the newly independent republics of Ukraine, Belarus, and Kazakhstan. Common concerns regarding the continued security of nuclear weapons in the former Soviet Union after 1991 eventually led to the creation of the Nunn-Lugar Cooperative Threat Reduction program,

64 Sokov, "Controlling Soviet/Russian Nuclear Weapons," p. 98.
65 Sokov, pp. 96–97.
66 William C. Potter, Nikolai Sokov, Harald Müller, and Annette Schaper, *Tactical Nuclear Weapons: Options for Control,* UNIDIR/2000/20 (Geneva: United Nations Institute for Disarmament Research, 2000), https://unidir.org/publication/tactical-nuclear-weapons-options-control, p. 9.

which funded efforts to decommission Soviet nuclear weapons slated for disarmament, and the Megatons to Megawatts program, which facilitated the sale to US energy companies of low-enriched uranium fuel converted from excess Soviet highly enriched uranium. These programs show that the PNIs not only contributed to progress in nuclear disarmament but also facilitated further nonproliferation and nuclear security measures.

Beyond securing Soviet nuclear weapons, US and Soviet/Russian leaders hoped to cut military spending through the PNIs. Throughout late 1991 and 1992, Bush, Gorbachev, and Yeltsin frequently stressed this point when addressing domestic audiences. Even during initial discussions with his NSC, Bush emphasized a goal of reducing military spending through the PNIs. During his September 1991 address announcing the PNIs, Bush stressed that the nuclear reduction measures could contribute to a "peace dividend" by enhancing US national security.[67] At the time, Bush argued for reallocating funds from nuclear programs toward other defense priorities, including the Strategic Defense Initiative, rather than providing "for a budget windfall for domestic programs."[68] In January 1992, Bush more clearly credited the PNIs with contributing to budget cuts, emphasizing that the initiatives, combined with other military reductions, would reduce overall defense spending by 30 percent from the start of his term.[69] While Bush emphasized the need for a strong military, he likely remained cognizant of the domestic political risks of continuing expensive defense programs, especially after violating his 1988 election pledge not to raise taxes.

On the Soviet/Russian side, the acute crisis that accompanied the Soviet Union's market liberalization partially drove Gorbachev and Yeltsin to pursue economic savings through nuclear reductions.[70] While Gorbachev's address on October 5, 1991, does not explicitly mention the social benefits of the PNIs, the transcripts of his calls with Bush before each of the 1991 PNI announcements reveal that economic considerations remained of paramount concern to him. Besides discussion of the PNIs themselves, both transcripts contain references to financial reforms undertaken in the

67 Bush PNI address.
68 Bush PNI address.
69 Bush SOTU.
70 Koch, p. 20.

Soviet Union and to efforts to integrate the Soviet Union into the Western financial system. Furthermore, a memo of October 16, 1991, calculating 11 billion rubles (approximately $220 million in 1991) in savings as a result of the first round of PNIs provides further evidence for economic motivations underlying Soviet engagement.[71] In contrast to Gorbachev, Yeltsin explicitly referred to the economic benefits of implementing the PNIs in his address of January 29, 1992, saying that "Russia will continue to make substantial reductions in its defense budget, imparting a social orientation to this area."[72] Although overshadowed by nuclear security concerns, economic considerations played a major role in driving the United States and Soviet Union to propose the PNIs in 1991.

On both sides, political leaders had a genuine desire to improve bilateral relations. As David E. Hoffman, who covered the Bush presidency and later served as Moscow bureau chief for the *Washington Post,* argues, cautious political leaders in the United States, including Bush and Scowcroft, reacted skeptically to Gorbachev's initial overtures in 1989. That skepticism resulted in a two-year delay before the two superpowers agreed on substantive cuts in nuclear arsenals through START I and the PNIs in 1991.[73] Indeed, the usually cautious Bush took an uncharacteristic risk in announcing unilateral nuclear reductions without any guarantee of Soviet reciprocation.[74]

In addition to increasing strategic stability, the upturn in bilateral relations provided a means for political leaders on both sides to improve their domestic political standing. For Bush, pursuing unilateral nuclear reductions allowed him to sidestep Congress, including right-wing members of his own party opposed to deeper cooperation with the Soviet Union. Likewise, the reciprocal unilateral reductions allowed Gorbachev to overrule Soviet military

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71 Vitaly Katayev, "Reference on expected reductions of defense allocations as a result of the implementation of the new Soviet initiative announced by M.S. Gorbachev on October 5, 1991, as well as allocations for measures for its implementation," October 16, 1991, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3117109-Document-13-Vitaly-Katayev-Memo-Reference-on.

72 Yeltsin PNI address.

73 David E. Hoffman, "1989: The Lost Year," Foreign Policy, November 4, 2009, p. 6.

74 Matthew Fuhrmann and Bryan R. Early, "Following START: Risk Acceptance and the 1991–1992 Presidential Nuclear Initiatives," *Foreign Policy Analysis,* Vol. 4, No. 1 (January 2008), pp. 21–43, https://doi.org/10.1111/j.1743-8594.2007.00056.x.

leaders opposed to cuts in military spending. Finally, both Gorbachev and Yeltsin used the PNIs to strengthen their often-tenuous political positions. In the aftermath of the August 1991 coup, Gorbachev sought to maintain his leadership role while facing challenges both from communist hardliners and nationalist reformists in the constituent Soviet republics. In calling for an additional Soviet-US summit during his October 5 address, Gorbachev likely hoped to channel some of his immense international popularity into domestic support.[75] For Yeltsin, confirming and expanding upon the PNIs provided the opportunity to establish himself as a credible partner for the United States, ultimately outmaneuvering Gorbachev. For the United States, the PNIs offered a means to support "reformist elements," both within emerging national movements and among the central Soviet authorities.

Finally, two other motivations facilitated the creation of the PNIs. For Gorbachev, the unilateral nuclear weapon reductions allowed him to make progress toward a world free of nuclear weapons, a state he viewed as not only possible but necessary for common security. The PNIs acted as a natural follow-up both to Gorbachev's plans to eliminate nuclear weapons by 2000 and to preexisting plans for reductions in Soviet tactical nuclear weapons.[76] For the United States, enacting portions of the PNIs—specifically the measures regarding tactical nuclear weapons based on surface ships and submarines—enabled it to respond to the views of various allies who supported more aggressive nuclear disarmament measures. These concerns included not only opposition by some NATO allies to modernization of ground-based tactical nuclear weapons in Europe, but also opposition to port calls by nuclear-armed naval ships in various allied states, most notably New Zealand.[77] Scowcroft alludes to this opposition when referencing "the Navy's problem" in his memoir, suggesting that US officials hoped to avoid controversy similar to the 1986 port call dispute between New

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75 Text of address by President Mikhail Gorbachev on the Presidential Nuclear Initiative, October 5, 1991. The address is reprinted in Koch, "Presidential Nuclear Initiatives," pp. 29-31.

76 Mikhail Gorbachev, letter to President Ronald Reagan, January 14, 1986, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=3131897-Document-01-General-Secretary-Mikhail-Gorbachev; Hoffman, "1989."

77 George Bush and Brent Scowcroft, *A World Transformed* (New York: Alfred A. Knopf, 1998), p. 545; quoted in Koch, "Presidential Nuclear Initiatives," p. 6.

Zealand and the United States in the aftermath of the former's adoption of nuclear-weapon-free status, which led to the partial abrogation of the ANZUS Treaty.[78] A September 1991 Joint Chiefs of Staff telegram regarding implementation of the PNIs supports this interpretation, as it notes a review of the navy's neither-confirm-nor-deny policy, which played a central role in the New Zealand port call dispute.[79] If allied support for nuclear disarmament measures—including New Zealand's declaration—contributed to the US undertaking the PNIs, it may call for further research into the influence of allied nuclear disarmament policies on US policy making.

Conclusions

Ultimately, the 1991-1992 PNIs achieved drastic cuts in tactical nuclear weapons while accelerating the elimination of strategic nuclear weapons slated for destruction under START I and facilitating further US-Russian cooperation in the areas of nuclear security and nonproliferation. Over the two decades that followed the announcement of the PNIs, the United States reduced its stockpile of tactical nuclear weapons by approximately 5,000, while Russia reduced its stockpile by approximately 14,000.[80] Uncertainty regarding the total numbers eliminated under the PNIs reveals the major weakness of the unilateral initiatives, namely the lack of accounting and verification that would have been part of a legally binding agreement.

According to former Soviet and Russian arms control negotiator Nikolai Sokov, the Soviet Union proposed negotiations on a legally verifiable treaty reducing tactical nuclear weapons but did not receive a positive response from the United States.[81] John Gordon's memo of October 10, 1991, may illuminate the reasons for US resistance to formal negotiations. In considering a verifiable cessation in production of weapon-grade fissile material, Gordon notes, "We will need to define what we want to do in

78 Koch, pp. 5–6.

79 Chairman of the Joint Chiefs of Staff, "Nuclear Force Initiatives."

80 Pomper, Potter, and Sokov, "Reducing and Regulating," p. 44.

81 Nikolai Sokov, "Tactical (Substrategic) Nuclear Weapons," in Dennis M. Gormley, Patricia M. Lewis, Miles A. Pomper, Lawrence Scheinman, Stephen I. Schwartz, Nikolai N. Sokov, and Leonard S. Spector, *Four Emerging Issues in Arms Control, Disarmament, and Nonproliferation; Opportunities for German Leadership* (Monterey, CA: James Martin Center for Nonproliferation Studies, 2009), https://www.jstor.org/stable/pdf/resrep09919.8.pdf, p. 72.

terms of 'openness and transparency,' but we do not want to get into a verification swamp. It is clear from earlier work that we cannot hope to verify the quantity of already existing Soviet material."[82] Similar concerns about the feasibility of verifying the elimination of tactical nuclear weapons likely dampened support for a legally binding approach. Furthermore, decade-long negotiations that resulted in START I led US policy makers to believe that the two superpowers could not develop a system for verifying tactical nuclear weapons within the window of opportunity that had opened in bilateral relations, especially considering the economic and political crises in the Soviet Union.[83] With the fall of the Soviet Union in December 1991, the proposal for a verifiable agreement on tactical nuclear weapons faded.

The United States and Russia would later discuss tactical nuclear weapons during START III consultations in 1997 and 1998; by that time, however, Russian institutional opposition to greater controls on such weapons had grown. At a March 1997 summit in Helsinki, Yeltsin and President Bill Clinton issued a joint statement, agreeing "that in the context of START III negotiations their experts will explore, as separate issues, possible measures relating to nuclear long-range sea-launched cruise missiles and tactical nuclear systems, to include appropriate confidence-building and transparency measures."[84] According to US nuclear nonproliferation expert William Potter, Russia initially raised the issue of sea-launched cruise missiles at the summit, and in response the United States proposed addressing all tactical nuclear weapons.[85] Following the summit, the United States and Russia briefly engaged in confidence-building and transparency measures regarding PNI implementation through a limited data exchange in the NATO-Russia

82 Gordon, "Nuclear Initiatives Discussion Paper."

83 Nikolai Sokov, "The Advantages and Pitfalls of Non-Negotiated Arms Reductions: The Case of Tactical Nuclear Weapons," *Disarmament Diplomacy,* No. 21 (December 1997), http://www.acronym.org.uk/old/archive/textonly/dd/dd21/21tactic.htm.

84 White House, Office of the Press Secretary, "Joint Statement on Parameters on Future Reductions in Nuclear Forces," Helsinki, Finland, March 21, 1997, Federation of American Scientists, https://fas.org/nuke/control/start2/text/helsinkistate.htm.

85 William C. Potter, "Practical Steps for Addressing the Problem of Non-Strategic Nuclear Weapons," in Jeffrey A. Larsen and Kurt J. Klingenberger, eds., *Controlling Non-Strategic Weapons: Obstacles and Opportunities* (Colorado Springs, CO: USAF Institute for National Security Studies, June 2001), https://www.hsdl.org/?view&did=437782, p. 216.

Permanent Joint Council.[86] While the US opposed verification efforts for tactical nuclear weapons primarily in the early 1990s, Russia featured greater institutional opposition to these controls by the late 1990s. As recounted by former US defense official David Yost, opposition to controls among Russian military leaders stemmed from several factors: NATO's conventional military superiority vis-à-vis Russia, uncertainty regarding NATO's intentions, and the importance assigned to tactical nuclear weapons by Russian military doctrine.[87] By the end of the decade, the 1999 war in Kosovo had precipitated a steep decline in bilateral relations, resulting in the end of information exchanges regarding the PNIs after only two years.[88]

In subsequent years, the lack of verification for PNI commitments led to a number of disagreements and controversies regarding each side's implementation of pledged reductions.

Although the United States initially planned to complete its reductions by 1998, it did not actually do so until 2003. Russia also missed its initial deadline of 2000. In 2001, inaccurate news reports indicated that Russia had transferred tactical nuclear weapons to Kaliningrad Oblast, an exclave bordering Poland, sparking controversy and Polish demands for inspection of Kaliningrad military facilities.[89] Subsequently, Russia announced at the 2004 Nonproliferation Treaty (NPT) Preparatory Committee meeting that it had eliminated 75 percent of Soviet tactical nuclear weapons while nearing completion of the PNIs. Later that year, the United States expressed doubts regarding Russia's implementation record.[90] In 2007, Russia announced that it had completed destruction of all ground-launched nuclear warheads, the last remaining category of tactical nuclear weapons pledged for destruction

86 David S. Yost, "Russia and Arms Control for Non-Strategic Nuclear Forces," in Larsen and Klingenberger, *Controlling Non-Strategic Weapons,* p. 133.
87 Yost, "Russia and Arms Control," pp. 122-123.
88 Nikolai Sokov and William Potter, "The Presidential Nuclear Initiatives, 1991-1992: An Assessment of Past Performance and Future Relevance," Policy Brief (Tokyo: Toda Peace Institute, October 2018), https://toda.org/assets/files/resources/policy-briefs/T-PB-21_Nikolai%20Sokov%20and%20William%20Potter_The%20Presidential%20Nuclear%20Initiatives%201991-92.pdf.
89 Sokov and Potter, "Presidential Nuclear Initiatives."
90 Wade Boese, "U.S., Russia Debate Tactical Nuclear Arms," *Arms Control Today,* November 2004, https://www.jstor.org/stable/23627536, p. 2.

under the PNIs.[91] Despite both sides having announced completion of PNI pledges, neither has provided a detailed accounting of reductions. This uncertain record of implementation speaks to the importance of following up unilaterally pledged reductions with verifiable agreements while the political will for disarmament remains strong.[92]

Finally, while unilateral nuclear reductions are often presented in contrast to verifiable bilateral arms control agreements, the two approaches are not necessarily at odds; one approach can support the other. The PNIs illustrate the benefits that can result from broad bilateral cooperation in the nuclear sphere and reliance on verifiable agreements. Accords such as START I, the Treaty on Conventional Armed Forces in Europe (CFE Treaty), and the Intermediate-Range Nuclear Forces Treaty laid the groundwork for the PNIs. While the crises of 1991-1992 did not provide sufficient opportunity for substantive negotiations on tactical nuclear weapons, the arms control negotiations, superpower summits, and bilateral consultations that took place before 1991 provided three important elements that allowed the PNIs to achieve drastic nuclear reductions over a short period of time—familiarity, transparency, and predictability.

First, the decade of negotiations that preceded the PNIs familiarized US and Soviet officials with each other's concerns even if they could not address them all. For example, Curtin, the Joint Chiefs of Staff representative to START I negotiations, received the initial task of developing a proposal for unilateral nuclear reductions.[93] Curtin's first-hand experience negotiating with the Soviets likely made him conscious of their long-standing concerns regarding naval tactical nuclear weapons when crafting the first PNI proposal. Chernyaev's September 27 diary entry exudes surprise at the US proposal, which included "even the Tomahawks, which the U.S. never agreed to before."[94] In short, years of negotiation had prepared policymakers to craft reciprocation proposals to which the other side would be largely amenable.

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91 Sokov and Potter, "Presidential Nuclear Initiatives."
92 Sokov, "Advantages and Pitfalls."
93 Koch, "Presidential Nuclear Initiatives," p. 7.
94 Chernyaev September 27 diary entry.

Second, the existence of START I and the CFE Treaty provided the transparency required for each side to take the risk of unilaterally reducing nuclear weapons. In his initial announcement of the PNIs, Bush referred to START's "substantial stabilizing reductions and effective verification" as a "springboard to achieve additional stabilizing changes."[95] Undersecretary Bartholomew made similar comments during his October 1991 consultations in Moscow, noting that "the START and CFE Treaties remain the framework for stable and secure relations."[96] Likewise, in his PNI address of January 29, 1992, Yeltsin stressed the importance of START and CFE ratification for facilitating the stability that permitted further nuclear arms reductions.[97]

Third, the predictability offered by previously developed military-to-military communication channels demonstrates the benefits of bilateral consultations conducted in the years preceding the PNIs. In Bush's initial call to Gorbachev regarding the PNIs, Gorbachev mentioned the potential of using preexisting military channels to clarify details.[98] Similarly, in his call announcing reciprocal PNI proposals to Bush, Gorbachev noted that Soviet and US experts had already begun discussing the details of the proposals.[99] Without these preexisting channels, the discussions might not have resulted in agreement on such drastic reductions in such a short period of time.

Ultimately, the PNIs achieved dramatic progress in nuclear disarmament at a time when conditions precluded formal arms control negotiations. While the PNIs relied upon stability provided by existing arms control arrangements, they also facilitated further verifiable strategic reductions under START II by accelerating elimination schedules under START I, framing negotiations, and removing potential hindrances from the negotiating agenda. Given this record, unilateral nuclear reductions such as the PNIs may better be understood as complementary to arms control negotiations, rather than as an alternative framework. For times when bilateral progress on negotiated arms

95 Bush PNI address.
96 "Bartholomew's Discussions."
97 Koch, pp. 35-37.
98 Bush-Gorbachev September 27 telephone call.
99 Bush-Gorbachev October 5 telephone call.

control agreements remains elusive, policy makers in both the United States and Russia should keep in mind the potential for unilateral disarmament measures to facilitate future negotiated agreements.

CHAPTER FIVE

Saving the World Twice Over: How Addressing Climate Change Provides Opportunities for US-Russian Cooperation

Aubrey Means

As the only alternative energy source capable of replacing fossil fuels at the necessary scale to combat the negative effects of climate change, nuclear power has the potential to become a significant investment for the world's economies in the coming decades. Yet concerns over proliferation, safety, and security should be addressed as reliance on nuclear energy increases.

Proliferation is a primary concern in today's international security landscape; experts and policy makers worry that new states will acquire nuclear-weapon capabilities and arsenals. The potential for increased civil dependence on nuclear energy may contribute to what nuclear expert Scott Sagan termed "nuclear latency," or the ability of a state to quickly develop a nuclear weapon if it chose to do so from its current state of technological development.[1] This concern, commonly associated with the spread of peaceful nuclear power, argues that there is an increased likelihood that states that are not currently pursuing development of nuclear weapons may obtain the material, know-how, and capacity to transform their peaceful nuclear facilities into weapon programs, given the right combination of political motivations.

Safety and security concerns refer to the protection and control of nuclear material already being used in peaceful nuclear facilities. Nuclear *safety* is generally conceived as efforts to protect people and the environment from

[1] Scott D. Sagan, "Nuclear Latency and Nonproliferation," in William Potter and Gaukhar Mukhatzhanova, eds., *Forecasting Nuclear Proliferation in the 21st Century: the Role of Theory,* Vol. 1, p. 58 (Redwood City, CA: Stanford University Press, 2010).

the dangers of radiation, exemplified by infamous nuclear incidents such as the 1986 Chernobyl disaster; nuclear *safety* refers to protecting nuclear material from being used by malicious or untrained people to cause similar destruction, whether deliberately (as in the case of extreme environmental activists or terrorists) or by accident. An expanding nuclear market risks expanding the scale of these proliferation, safety, and security concerns as current nuclear powers compete for the business of supplying newcomers to the nuclear industry.

Russia and the United States have competed economically since the Cold War to supply technology, material, and expertise to developing nuclear power programs around the world, competition that actually began shortly after President Dwight Eisenhower's "Atoms for Peace" speech in December 1953. Today's new horizon of nuclear power expansion, particularly in Africa and Asia, provides an opportunity for both the United States and Russia to cooperate on nonproliferation objectives, both in parallel with and in spite of their economic competition.

There is a historical precedent for successfully balancing the nonproliferation obligations under Article I of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) with the commitment under the treaty's Article IV to promote the peaceful use of nuclear energy. During the geopolitically tense days of the Cold War, the United States and the Soviet Union demonstrated remarkable cooperation in their negotiations surrounding the London Club and the establishment of early strategic export controls. This teamwork in the 1970s, during a time of geopolitical conflict between the two superpowers that was even worse than that of today, can serve as a model for future collaboration between major nuclear exporters such as the United States and Russia, beginning in scientific and technological circles.

Climate Change and Nuclear Power

Why should great powers such as Russia and the United States, who have the world's largest nuclear arsenals and control of nearly 90 percent of the world's

nuclear material,[2] be concerned about the threat of climate change? Their military strength does not make them invulnerable to climate catastrophe—in fact, severe weather events such as floods or fires are particularly dangerous to much of the infrastructure each depends on for its national security. A 2019 study found that of the 79 US military bases threatened by climate catastrophe, 23 are related to the nuclear mission, and seven of those keep a total of nearly 6,000 nuclear warheads on-site.[3] Meanwhile, a 2009 congressional study found that major Russian military and civilian ports such as Vladivostok, Murmansk, and Sebastopol—all of which are key to maintaining the Russian nuclear fleet—are at a high risk of flooding due to rising sea levels by 2030.[4]

Major nuclear powers should also consider their moral responsibility for ameliorating the current climate situation. The United States is the world's second-largest carbon emitter after China,[5] and the US military as an institution is the single largest carbon emitter in the world.[6] Both the United States and Russia are among the world's leaders in oil production, one of the biggest greenhouse-gas-emitting industries.[7] On the basis of current levels of pollution and carbon emissions, the Intergovernmental Panel on Climate Change (IPCC) predicted that the negative effects of climate change would worsen in the coming decades. In October 2018, the IPCC reported that Earth is due to surpass a critical climate threshold by 2040, beyond which the

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[2] Nuclear Threat Initiative (NTI) and Center for Energy and Security Studies (CENESS), "Pathways to Cooperation: A Menu of Potential US-Russian Cooperative Projects in the Nuclear Sphere," February 2017, p. 5, https://media.nti.org/documents/Pathways_to_Cooperation_FINAL.pdf.

[3] Matt Korda, "The US Nuclear Deterrent Is Not Prepared for Climate Crisis," Forbes, March 16, 2020, https://www.forbes.com/sites/matthewkorda/2020/03/16/the-us-nuclear-deterrent-is-not-prepared-for-climate-catastrophe/#6d83042d3a1e.

[4] National Intelligence Council, "Russia: Impact of Climate Change to 2030," Special Report NIC 2009-04D, April 2009, https://www.dni.gov/files/documents/climate2030_russia.pdf.

[5] Union of Concerned Scientists, "Each Country's Share of CO2 Emissions," May 11, 2020, https://www.ucsusa.org/resources/each-countrys-share-co2-emissions.

[6] Korda, "The US Nuclear Deterrent."

[7] US Environmental Protection Agency (EPA), "Greenhouse Gas Emissions," https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

consequences of climate change will become irreversible.[8] In many respects, therefore, the United States and Russia have a moral obligation to clean up the environmental mess they have partially created.

Any solution to combat climate change must include a variety of alternative energy sources—including nuclear, wind, and solar power—and a shift away from the planet's heavy reliance on fossil fuels. Of the alternatives available, however, nuclear power is the only one capable of replacing fossil fuels at the scale necessary to reverse global warming before the planet's climate threshold is reached. Unlike renewable energy sources such as wind and solar, which are considered to be intermittent sources and limited by variability in fuel, nuclear plants provide a constant, reliable baseload of power. In order for their power output to be less weather dependent, wind and solar must be connected to a backup power source—such as large-scale storage systems, which are not currently available at grid scale—or used in combination with a more constant supply of energy such as a nuclear power plant.[9] For this reason, renewable energy sources can be difficult to integrate into a power grid:

> The more a power grid relies on renewables…the more often the supply will not match the demand. In the extreme, extra power must be dumped—meaning that valuable capital and land were used inefficiently… Although most efficient when running flat out 24 hours a day, nuclear power plants can also operate flexibly to cover the supply gaps from wind and solar power.[10]

Wind and solar power are also major drains on land supply: the US Department of Energy calculates that roughly 431 wind turbines or 3.125 million solar panels would be required to produce the same amount of

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[8] Intergovernmental Panel on Climate Change, "Special Report: Global Warming of 1.5°C," October 7, 2018, https://www.ipcc.ch/sr15/.

[9] US Department of Energy, Office of Nuclear Energy (DOE-NE), "Nuclear Energy is the Most Reliable Energy Source and it's Not Even Close," March24, 2021, https://www.energy.gov/ne/articles/nuclear-power-most-reliable-energy-source-and-its-not-even-close.

[10] Ines Azevedo, Michael R. Davidson, Jesse D. Jenkins, Valerie J. Karplus, and David G. Victor, "The Paths to Net Zero: How Technology Can Save the Planet," *Foreign Affairs,* Vol. 99, No. 3 (May/June 2020), https://www.foreignaffairs.com/articles/2020-04-13/paths-net-zero.

electricity as a single nuclear power plant.[11] All considered, the economic utility of renewable energy sources has been calculated to peak at around 40 percent of the electrical grid,[12] which cannot begin to reduce carbon emissions at the rate suggested by the IPCC. This leaves a large role for nuclear.

Most importantly, nuclear energy generation produces zero carbon emissions, and the cost per unit of electricity generated by solar or wind power is 22-40 percent more expensive than that generated by nuclear power.[13] Current evidence of this can be found in Germany, which in recent years has transitioned largely to renewable power, and whose electricity is 1.7 times more expensive than the French equivalent. (In France, roughly 70 percent of national electricity is currently produced by nuclear energy.)[14] Once a plant is built, nuclear power is also a much faster method of generating large amounts of clean electricity than its renewable alternatives, a significant factor given the fast-approaching deadline predicted by the IPCC. For example, France and Sweden have both decarbonized their power grids and now emit less than one-tenth of the world average of carbon dioxide per kilowatt-hour, having replaced nearly all of their fossil-fueled electricity with nuclear power in 15 to 20 years.[15]

Of course, nuclear power has its critics as well. While its long-term savings in energy production may be clear, the initial financial barriers to entry for nuclear newcomers are substantial: capital costs including site preparation,

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11 DOE-NE, "The Ultimate Fast Fact Guide to Nuclear Energy," January 2019, https://www.energy.gov/sites/prod/files/2019/01/f58/Ultimate%20Fast%20Facts%20Guide-PRINT.pdf.

12 Leon Hirth, "The Market Value of Variable Renewables," *Energy Economics,* Vol. 38 (2013), pp. 218-236, https://neon.energy/Hirth-2013-Market-Value-Renewables-Solar-Wind-Power-Variability-Price.pdf.

13 World Nuclear Association, "Nuclear Power in the World Today," March 2020, https://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx.

14 Environmental Progress, "The Complete Case for Nuclear," http://environmentalprogress.org/the-complete-case-for-nuclear?emci=e56d0016-7a59-ea11-a94c-00155d039e74&emdi=bc695325-7b59-ea11-a94c-00155d039e74&ceid=2579676.

15 Joshua S. Goldstein, Staffan A. Qvist, and Steven Pinker, "Nuclear Power Can Save the World," *New York Times,* April 6, 2019, https://www.nytimes.com/2019/04/06/opinion/sunday/climate-change-nuclear-power.html.

engineering, and manufacturing on top of operating costs such as fuel and maintenance are much higher than those of coal and natural gas[16]—prohibitively so for many countries. Modern efforts to standardize nuclear power plant construction through more efficient design and manufacturing seek to lower exorbitant capital costs and make investing in nuclear power a more economical option for newcomer countries. Programs such as the US Department of Energy's Nuclear Waste Fund also take a portion of every electric bill paid by consumers of nuclear-generated electricity and return it to utility companies to help offset the cost of decommissioning nuclear power plants. As of 2016, that fund had already collected some $46 billion from individual ratepayers.[17]

Public fears surrounding radiation are also a major obstacle to the promotion of nuclear power as an energy source. This is especially true in the United States, where the debate has become increasingly political—a prime example being the stalemate over the Yucca Mountain repository[18]—severely hobbling the US domestic nuclear industry as a whole. Environmentalists and health experts opposed to nuclear power often cite infamous civilian mishaps, such as those at Three Mile Island and Chernobyl, as well as early military forays into nuclear technology that resulted in large amounts of pollution: in the 1940s, pressure to maximize plutonium production at the Manhattan Project's Hanford site in Washington State led to significant amounts of hazardous and radioactive contaminants being leaked into local land and water resources, including the Columbia River, which are still being cleaned up today.[19] Fears over radiation leaks, pollution, and the proper treatment and transfer of nuclear waste must be addressed before populations will

16 Daria Iurshina, Nikita Karpov, Marie Kierkegaard, Evgeny and Semenov, "Why Nuclear Power Plants Cost So Much, and What Can Be Done About It," *Bulletin of the Atomic Scientists,* June 20, 2019, https://thebulletin.org/2019/06/why-nuclear-power-plants-cost-so-much-and-what-can-be-done-about-it/.

17 US Department of Energy, Office of the Inspector General, "Department of Energy Nuclear Waste Fund's Fiscal Year 2016 Financial Statement Audit," December 2016, https://www.energy.gov/ig/downloads/audit-report-oai-fs-17-04.

18 US EPA, "What is the Yucca Mountain repository?," n.d., https://www.epa.gov/radiation/what-yucca-mountain-repository.

19 National Oceanic and Atmospheric Association, "Hanford Nuclear Site," updated August 17, 2020, https://darrp.noaa.gov/hazardous-waste/hanford-nuclear-site.

support large investment in nuclear infrastructure. Encouragingly, however, many of the technologies that resulted in disasters like the one experienced at Chernobyl are no longer in use. Additionally, countries such as Sweden, Finland, and France are currently developing new technology and strategies such as deep geological repositories for spent fuel,[20] and private corporations such as Deep Isolation in the United States are exploring on-site drilling technologies,[21] that may provide a safe, long-term solution to the question of dealing with future nuclear waste.

It makes sense that emerging economies would turn to nuclear power as the most sustainable source of energy for the future, in terms of both production and long-term cost. The World Nuclear Association's Harmony Program has set a goal that by 2050 one-quarter of the world's electricity will be supplied by nuclear energy, which would require roughly tripling the current number of reactors around the world.[22] Already some 450 power reactors today account for roughly 10 percent of the world's electricity, lowering carbon dioxide emissions by more than 1 billion metric tons.[23]

In addition to its value in combating climate change, experts have long predicted a "new nuclear renaissance" driven by economic growth and power demand both in established markets and emerging economies.[24] Rafael Grossi, who is now director general of the International Atomic Energy Agency (IAEA) and was chairman of the Nuclear Suppliers Group (NSG), remarked in 2016 that in "the post-Fukushima or…post-Iran deal [world] you see only an increased curve in nuclear activities and trade…in Asia or Latin America or other parts of the world where more nuclear is [anticipated]

[20] Stimson Center, "Spent Nuclear Fuel Storage and Disposal," n.d., https://www.stimson.org/2020/spent-nuclear-fuel-storage-and-disposal/.
[21] Deep Isolation, "Our Team," n.d., https://www.deepisolation.com/team.
[22] World Nuclear Association, "The Harmony Programme," updated March 12, 2019, https://www.world-nuclear.org/our-association/what-we-do/the-harmony-programme.aspx.
[23] Azevedo et al., "The Paths to Net Zero."
[24] Mark Hibbs, "The Nuclear Suppliers Group and Geostrategic Politics," *Strategic Trade Review,* Vol. 3, No. 5 (Autumn 2017), p. 6.

in the next few decades."[25] In fact, 2019 marked the seventh consecutive year that global nuclear power generation has risen, at 311 terawatt-hours higher output than in 2012.[26] There are currently 30 countries planning future nuclear power programs, and more than 100 power reactors on order or under construction around the world[27]—most of which have turned to existing nuclear powers for supplies and expertise.

Competition for Nuclear Markets

Economic competition between the United States and Russia as nuclear suppliers today is an extension of the competition between the United States and the Soviet Union during the Cold War. Historically, both sought overseas nuclear markets as a means of strengthening alliances and countering each other's influence in developing countries. This trend continues in the 21st century. According to the Russian Academy of Sciences, "Russia sees the export of civilian nuclear technology and services as an industry essential to its plans for economic growth"[28] and is currently beating out most of its competitors to supply 80- to 100-year power deals around the world.[29] Rosatom, the state-owned nuclear energy corporation, makes and exports

25 EU Nonproliferation and Disarmament Conference 2016 Special Session 8, "The Future of the Nuclear Suppliers Group," November 3, 2016, https://www.iiss.org/-/media/images/dialogues/eunp/eunp-2016/documents/the-future-of-the-nuclear-suppliers-group-_-iiss.pdf.

26 World Nuclear Association, "Nuclear Power in the World Today," March 2021, https://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx.

27 World Nuclear Association, "Plans for Nuclear Reactors Worldwide," May 2020, https://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx.

28 National Research Council and Russian Academy of Sciences, *Strengthening U.S.-Russian Cooperation on Nuclear Nonproliferation: Recommendations for Action* (Washington, DC: National Academies Press, 2005), pp. 27-32, https://doi.org/10.17226/11302.

29 Tom DiChristopher, "The US is losing the nuclear energy export race. Here's the Trump team's plan to turn the tide," CNBC, April 4, 2019, https://www.cnbc.com/2019/03/21/trump-aims-to-beat-china-and-russia-in-nuclear-energy-export-race.html.

more large power reactors than all of its competitors combined.[30] Foreign orders for Russian nuclear assistance totaled over $130 billion in 2017,[31] and in that same year, Rosatom held 36 percent of the world's nuclear fuel enrichment services.[32]

In the face of this steep competition, the US State Department announced in 2019 a renewed goal of expanding its share of the nuclear market by facilitating early-stage talks and signing memorandums of understanding with potential customers long before actual construction and development of a nuclear power plant takes place. Most Russian nuclear exports are to countries traditionally associated with the Non-Aligned Movement, including Algeria, Bolivia, Cambodia, Cuba, Ghana, Nigeria, Paraguay, Saudi Arabia, Sudan, Tajikistan, Tunisia, the United Arab Emirates, and Zambia.[33] Western observers fear that the Russian nuclear industry is building "spheres of energy dependence" by broadly targeting so many new markets.[34] This echoes the Cold War era, when a primary motivation shared by the Soviet Union and the United States in exporting nuclear technology to other nations was to develop their own spheres of influence while countering the domination of the other. By also engaging with nontraditional allies well in advance of any nuclear construction, therefore, the United States hopes to cultivate relationships and influence that will not only reward its own companies with more nuclear supply contracts, but will additionally benefit strategic relations in surrounding regions while countering any Russian presence there.[35]

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30 Ben Aris, "Rosatom rolls out the small modular reactor: a mini-nuclear power station to solve some big problems," bne IntelliNews, November 26, 2019, https://www.intellinews.com/rosatom-rolls-out-the-small-modular-reactor-a-mini-nuclear-power-station-to-solve-some-big-problems-172117/.

31 World Nuclear Association, "Nuclear Power in Russia," May 2020, https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-power.aspx.

32 Névine Schepers, "Russia's Nuclear Energy Exports: Status, Prospects, and Implications," Nonproliferation and Disarmament Papers, No. 61, EU Nonproliferation and Disarmament Consortium, February 2019, p. 2. https://www.sipri.org/sites/default/files/2019-02/eunpdc_no_61_final.pdf.

33 Schepers, "Russia's Nuclear Energy Exports," p. 2.

34 Schepers, p. 8.

35 DiChristopher, "The US is losing."

The growing recognition that any effective climate solution must include a significant investment in nuclear energy has made Russia's domination of the nuclear market concerning to competitors outside the United States, as well. France and South Korea are also woefully behind Rosatom in their reactor exports. Even China, which is seeking to expand its nuclear export business as part of its ambitious Belt and Road Initiative, exported roughly 40 percent fewer reactors than Russia in 2018.[36] This is partly because China's main reactor for export, the Hualong-1, is not "a tried and tested technology" when compared to Rosatom's proven, standardized models, thus deterring potential buyers who are seeking long-term reliability.[37] Clearly, the civilian nuclear industry is just as important a vehicle for great power competition today as it was during the Cold War.

One common concern among nuclear security experts is that nuclear export competition will result in a weakened emphasis on safeguards and security standards for new nuclear programs. In fact, Russia and the United States currently have some of the strictest nuclear supply agreements of all the principal nuclear suppliers. The US and Russian nuclear cooperation framework agreements are legally binding on all governments, companies, and parties involved and mandate nuclear security standards as defined by the IAEA and NSG. Assurances of nonproliferation measures within the agreements are key. The US nuclear cooperation agreements with Taiwan and the United Arab Emirates contain a "gold standard" provision, in which the counterparty agrees to forgo reprocessing nuclear fuel, thereby preventing a buildup of plutonium that could be used to make nuclear weapons. Likewise, Russian nuclear supply agreements increasingly include spent fuel take-back provisions, in which the spent fuel is transported to Russia for reprocessing before returning the waste to the country of origin, keeping the separated plutonium in secure Russian facilities. However, these expanded nonproliferation assurances are not universally incorporated in supply agreements. What's more, few nuclear suppliers including Russia and the United States require customers to be a signatory to any treaty or convention

[36] "Russia Leads the World at Nuclear-Reactor Exports," *Economist,* August 7, 2018, https://www.economist.com/graphic-detail/2018/08/07/russia-leads-the-world-at-nuclear-reactor-exports.
[37] Schepers, "Russia's Nuclear Energy Exports," p. 4.

beyond the NPT, such as the Convention on the Physical Protection of Nuclear Material, the International Convention for the Suppression of Acts of Nuclear Terrorism, or the Convention on Nuclear Safety, to name a few. The higher standards for nuclear supply exemplified in some recent Russian and US nuclear supply agreements should not only be made universal across the civil nuclear industry, but could be further strengthened by requiring that recipients adhere to these additional conventions. Russia and the United States should therefore continue to model the example of the gold standard in their own supply agreements, as well as use their influence internationally to pressure other suppliers such as France, China, and South Korea to incorporate such terms into their own export contracts.

Precedent for Partnership

Just as the United States and Russia compete today for contracts to supply civilian nuclear programs, they competed bitterly in both civilian and military nuclear spheres during the Cold War. Especially during the early 1970s, when a global oil crisis and fears of a uranium shortage increased the demand for nuclear energy, Moscow sold nuclear power plants as a means of cultivating alliances in the Third World while the United States exported its own reactors to counter Soviet dominance. Yet when India conducted its first nuclear test in 1974, euphemistically referred to as a "peaceful nuclear explosion," both superpowers were awakened to the need for coordinated export policies. Coordination was key: none of the major nuclear suppliers at the time (including France, West Germany, Japan, the United Kingdom, and Canada) were willing to restrict their market competitiveness by implementing trade controls alone. Universal export standards therefore served states' commercial interests as well as nonproliferation obligations under the NPT. In this context, US Secretary of State Henry Kissinger "regarded US-Soviet leadership as the key to engaging other major suppliers…in adopting more stringent export practices"[38] despite their traditional geopolitical opposition.

[38] Sarah Bidgood, "The establishment of the London Club and nuclear-export controls" in William C. Potter and Sarah Bidgood, eds., *Once and Future Partners: The United States, Russia, and Nuclear Non-proliferation* (London: International Institute for Strategic Studies, 2018) p. 141.

The convening of nuclear suppliers in what would be known as the London Club in 1975 was the first step to formally adopting a set of nuclear export control standards. US and Soviet participants had a common objective in this effort. In London Club meetings between 1975 and 1978 (as well as within the Zangger Committee negotiations, in which the Soviet Union was not formally invited to participate but were designed to implement export control provisions of the NPT), the United States represented Soviet interests where it was politically difficult for the USSR to do so, while Soviet delegations "demonstrated a willingness to show flexibility and embrace compromises the US sought to orchestrate, even when they fell short of Moscow's preferences."[39] This teamwork was particularly important when negotiating the participation of other nuclear suppliers in the London Club, such as France and West Germany, who were regarded as being less motivated to implement stricter controls on their nuclear exports. According to an analysis in the *Strategic Trade Review,* US and Soviet effectiveness in administering export controls on the nuclear trade regime "was never affected by East-West political strife; [they] proved to be like-minded on most issues concerning preventing nuclear nonproliferation."[40]

Ultimately, cooperation between Soviet and US delegations was instrumental in producing the London Club's nuclear export guidelines, published as an IAEA document, INFCIRC/254. This list of guidelines was updated regularly from the original London Club meetings until 1991, when the organization was rebranded as the Nuclear Suppliers Group. The NSG's list of dual-use items under export controls remains a central pillar of today's multilateral export control regimes, which further influence controls at the national and industry levels. In addition to the NSG, this group of regimes includes the Australia Group, primarily focused on preventing the spread of chemical weapons and material; the Missile Technology Control Regime; and the Wassenaar Agreement, which addresses conventional arms control. These regimes "have come to function as key norm-setters in the area of supply-side nonproliferation policies and state behavior, including non-participating states, a growing number of which voluntarily adhere to their guidelines

[39] Bidgood, "The establishment of the London Club," p. 157.
[40] Hibbs, "The Nuclear Suppliers Group," p. 1.

and…control lists."[41] Particularly with regard to nuclear nonproliferation, none of this would have been possible without US-Soviet teamwork.

This teamwork, however, has been sorely lacking in recent years within the NSG. Cooperation, information sharing, and compromise between the world's primary nuclear powers is critical to engaging and swaying other members of global organizations—particularly in those that require full consensus for all decisions, such as the NSG. In theory, the leadership of Russia and the United States in the NSG should serve as a guiding force for implementing security standards across international nuclear power development; yet, thanks to opposing viewpoints arising from geopolitical tension, both powers continue to pull apart from each other, taking their respective allies with them. According to an analysis by the Stockholm International Peace Research Institute, "specific adversarial relationships between states that are not members of all regimes [for example, China is a member of the NSG only, and Russia does not belong to the Australia Group] affect their ability to work together. … Discussions that are bilateral or between groups of like-minded states are more common [than general information sharing]."[42] A 2002 report by the US General Accounting Office noted "the lack of basic information sharing by members of the NSG and criticized the lack of transparency between members,"[43] and Russian President Vladimir Putin has encouraged representatives at these forums to more strongly defend Russian national strategic interests in nuclear matters.[44] As a result, the consensus decisions necessary for effecting change have lately been rendered all but impossible.

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41 Kolja Brockmann, "Challenges to Multilateral Export Controls: The Case for Inter-regime Dialogue and Coordination," Stockholm International Peace Research Institute," December 2019, p. 3, https://www.sipri.org/publications/2019/other-publications/challenges-multilateral-export-controls-case-inter-regime-dialogue-and-coordination.

42 Brockmann, "Challenges to Multilateral Export Controls," p. 2.

43 Brockmann, p. 7.

44 Hibbs, "The Nuclear Suppliers Group," p. 9.

Scientific and Technological Circles

The question, then, is how the United States and Russia can be encouraged to reproduce their London Club cooperation in a modern context, in spite of their competition in the nuclear market and opposing geopolitical views. Just as the demand for nuclear power grew in the 1970s, the market for civilian nuclear material, technology, and expertise is expanding among today's emerging economies in part due to its value to future climate solutions. But there is general concern that attendant proliferation, safety, and security risks are expanding as well, increasing the risk of an unwelcome surprise similar to India's 1974 nuclear test—or worse, given the 21st century's experience with non-state actors and the threat of nuclear terrorism. Technological research and development (R&D) among nuclear powers on how to produce a new generation of nuclear energy production while mitigating these risks is therefore a high priority. For example, China is set to become one of the first countries to construct an early Generation IV reactor, designed to maximize energy efficiency while reducing radioactive waste within a closed system.[45] Economic competition for nuclear supply contracts is not going to go away. Yet some kind of cooperation to mitigate modern risks is essential—especially between the United States and Russia, whose outsized role in the nuclear industry may allow them to influence the behavior of other suppliers.

One way to enable greater cooperation in today's context may be to take the onus off politicians and policy makers and place it on the technology sector. Here, cooperation between states is more conceivable than in high-level political circles, where world leaders balance competing priorities of geopolitical tensions and domestic partisan pushback. Instead, informal or semiformal partnerships and initiatives within scientific and technical communities may be better suited to achieving common goals. This idea is not new: in 2016, the Nuclear Threat Initiative and the Center for Energy and Security Studies sponsored a dialogue between nuclear experts in the United States and Russia to brainstorm potential opportunities for nuclear

45 "China Starts Work on 'Landmark' Fourth-Generation Fast Breeder Reactor," *Global Construction Review,* January 3, 2018, https://www.globalconstructionreview.com/news/china-starts-work-landmark-fourth-generation-fast-/.

cooperation.[46] The IAEA also already offers substantial support for efforts like this, through its International Project on Innovative Nuclear Reactors and Fuel Cycles.[47] The United States and Russia are two of the 41 members of this project, and they are uniquely placed to lead a constructive dialogue on long-term planning, development, and implementation of secure nuclear energy thanks to their extensive nuclear R&D infrastructures. Furthermore, forums exist for technical cooperation in other areas between nuclear supplier states: the Generation IV International Forum brings together scientists from government laboratories and industry in Russia, the United States, China, and other countries to collaboratively produce the latest developments in nuclear research.[48]

Ironically, there are also examples of technical competition-cum-cooperation. Rosatom and the US corporation Westinghouse have been working in recent years to manufacture fuel for each other's reactors: in Ukraine, for example, Westinghouse has been developing fuel assemblies for the country's Russian-provided VVER-1000 reactors, one of which was loaded entirely with Westinghouse fuel for the first time in 2018.[49] This fuel diversification is of great interest to suppliers who may still be able to win business providing fuel assemblies to countries with whom they did not sign a long-term power contract, but it also benefits countries investing in new nuclear power plants by preventing them from being beholden to a single supplier for the lifespan of their reactor units. While the current fuel replacement efforts of Rosatom and Westinghouse are geared toward competition for nuclear customers, combining US and Russian technical experiences in nuclear fuel production also suggests a possible role for cooperation in the development of new, proliferation-resistant fuels that can better serve the nuclear industry as a whole.

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46 NTI and CENESS, "Pathways to Cooperation," p. 4.

47 IAEA, "International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO)," n.d., https://www.iaea.org/services/key-programmes/international-project-on-innovative-nuclear-reactors-and-fuel-cycles-inpro.

48 National Research Council and Russian Academy of Sciences, *Strengthening U.S.-Russian Cooperation,* pp. 27-32.

49 Schepers, "Russia's Nuclear Energy Exports," p. 9.

US-Russian cooperation within scientific communities may yield multiple benefits. First, as is already done in individual countries as well as the NSG, cooperative groups of experts can identify sensitive items and technologies to include in updated export control lists, which can then be adopted by both countries and private industries to ensure effective, up-to-date implementation of license authorization on nuclear technology and material. Second, scientific innovations may improve the safety and security of new reactor technology entering the market. Through standardization and repetition, these innovations would also lower the up-front cost of building nuclear power plants—one of the main obstacles to their adoption—and enable more economies to reap the benefits of nuclear power and long-term cost savings in their energy grid.[50]

In addition to these multilateral research forums, the growing industry of small modular reactors (SMRs) is another area where collaboration between US and Russian scientific communities is essential. Although US nuclear developers such as Westinghouse, which just recently emerged from bankruptcy and has not signed a nuclear supply contract since 2007, struggle to compete with Rosatom for international nuclear supply contracts, smaller companies are making a name for themselves in the field of SMRs. [51] These are designed to be scalable, flexible versions of pressurized water reactors for a fraction of the financial or infrastructural investment required by a full-scale nuclear power plant. Critically for economies in the developing world, the modularity of SMRs allows a country to begin with one or two modules to attract industry and then scale up to greater power generation as the region is better able to support higher electrical supply. In some cases, SMRs may also be used for nonelectrical applications, including providing heat for industrial processes, hydrogen production, seawater desalination, or serving niche markets such as burning nuclear waste.[52]

50 Goldstein, Qvist, and Pinker, "Nuclear Power Can Save the World."
51 Schepers, "Russia's Nuclear Energy Exports," p. 3.
52 IAEA, *Advances in Small Modular Reactor Technology Developments: 2018 Edition,* September 2018, https://aris.iaea.org/Publications/SMR-Book_2018.pdf.

The US-based company NuScale Power has the first SMR to receive US Nuclear Regulatory Committee design approval,[53] and has virtually built an entire market infrastructure to supply nuclear power generation to emerging economies with its technology.[54] NIKIET, a major Russian R&D center for nuclear technology and engineering, is currently working on licensing several of its own SMR designs for future export.[55] They and other SMR producers may be the future of the growing market for nuclear exports as more emerging economies identify SMRs as a practical means of entry into the world of nuclear power. For instance, Jordan recently abandoned its plan to construct a $10 billion, two-unit power plant with Rosatom in favor of SMRs.[56] It is therefore critical that SMR producers reflect updated and effective nonproliferation, safety, and security measures in their technical development, internal export control, and compliance systems. In fact, in 2018, the IAEA's Nuclear Power Technology Development Section evaluated near-term deployable SMRs as having safety performance comparable to or better than that of evolutionary reactor designs.[57] These measures should be standardized across the globe, regardless of whether the designs themselves originate in the United States, Russia, or elsewhere. This will necessitate US-Russian cooperation from the very beginning of the development process.

Multilateral Forums

Although engaging US-Russian cooperation via informal scientific or technical circles may be easier to achieve than concluding a legally binding treaty between countries, one cannot dismiss the essential role played by policy makers. There are a number of existing multilateral forums may help to facilitate the creation of effective policy.

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53 NuScale, "NuScale Power Makes History as the First Ever Small Modular Reactor to Receive U.S. Nuclear Regulatory Commission Design Approval," August 28, 2020, https://newsroom.nuscalepower.com/press-releases/news-details/2020/NuScale-Power-Makes-History-as-the-First-Ever-Small-Modular-Reactor-to-Receive-U.S.-Nuclear-Regulatory-Commission-Design-Approval/default.aspx.

54 NuScale, "NuScale Power Makes History."

55 "Six Russian SMR designs," *Nuclear Engineering International,* January 16, 2019, https://www.neimagazine.com/features/featuresix-russian-smr-designs-6939130/.

56 Schepers, "Russia's Nuclear Energy Exports," p. 4.

57 IAEA, *Advances in Small Modular Reactor Technology Developments.*

Since they first emerged in the 20th century, the control lists produced by the multilateral export control regimes have served as a model for national policies around the world regarding the export and end use of sensitive items. These policies are further adopted by industry, so that a dual-use item identified by the NSG on a global level is subject to license authorization through the internal compliance program of an individual corporation within a given country. To further promote nuclear nonproliferation, safety, and security measures as global nuclear investment expands, the United States and Russia should cooperatively wield their influence in these forums to expand recommendations from the export control regimes. In order to facilitate this coordination among regime members, despite geopolitical differences, an interagency contact group on export controls should be established to meet regularly and discuss political and technical issues of mutual concern that require more detailed engagement and information sharing.

Examples of cooperative initiatives within the regimes might include the following: First, in addition to identifying dual-use goods subject to export controls, the NSG might stipulate that the export of nuclear reactors must be accompanied by nonproliferation workshops or training provided by the IAEA or the supplier itself. Additionally, inspired by the 2003 EU Strategy against Proliferation of Weapons of Mass Destruction,[58] suppliers in the NSG could establish a program of technical assistance and recommended institutional frameworks for states lacking experience in export controls. Suppliers could also be responsible for establishing training centers for internal guards at nuclear power plants, encouraging the practice of universally standardized security measures. These and other suggestions were advocated by the Initiatives for Proliferation Prevention, a collaboration between the United States and former Soviet states that was established in 1994 and lasted until Russian withdrawal in 2015.[59]

Another existing multilateral forum that may prove particularly effective at facilitating US-Russian collaboration is the P5 Process—so called because it involves the five NPT nuclear-weapon states, which are also the five

58 Schepers, "Russia's Nuclear Energy Exports," p. 10.
59 National Research Council and Russian Academy of Sciences, *Strengthening U.S.-Russian Cooperation,* pp. 27-32.

permanent members of the UN Security Council. The P5 Process was originally established in 2009 at the behest of the United Kingdom, in an effort to break through the stagnation surrounding nuclear disarmament as former Cold War motivations weakened with time. After the 2010 NPT Review Conference produced a 64-point Action Plan highlighting ways the nuclear-weapon states could enhance transparency into their disarmament efforts, the process was hailed as the prime venue for regular dialogue among the nuclear-weapon states that would build mutual confidence and progress toward the NPT's disarmament goals.[60]

Since its creation, the P5 Process has been recognized for its potential to generate real cooperation at a high level, but thus far has delivered very modest concrete outcomes. Generally, it is extremely difficult to launch official bilateral initiatives between the United States and Russia due to geopolitical tension. Instead, it could be easier to utilize the P5 Process as an existing mechanism to engage both sides, even if it is technically on a multilateral basis. An initiative featuring US-Russian collaboration would be an excellent way to get the process going and set the benchmark for the type of outcomes the P5 members hope to achieve.

In October 2019, London hosted a P5 meeting in which the UK representative to the Conference on Disarmament identified the importance of P5 cooperation on Article IV initiatives.[61] This demonstrates a willingness on the part of major nuclear suppliers—including France and China, in addition to the United States and Russia—to discuss the topic of civilian nuclear power. Going forward, this may also suggest a shift in emphasis to this third pillar of the NPT, which has historically been overshadowed by disarmament and nonproliferation priorities.

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60 Andrea Berger, *The P5 Nuclear Dialogue: Five Years On,* Royal United Services Institute, July 2014, https://rusi.org/sites/default/files/201407_op_the_p5_nuclear_dialogue.pdf.

61 Statement by Ambassador Aidan Liddle, UK permanent representative to the Conference on Disarmament, to the UN General Assembly, October 8, 2019, https://www.gov.uk/government/speeches/un-general-assembly-74th-session-uk-statement-at-the-first-committee-general-debate.

The P5 Process is also an effective forum for US-Russian cooperation because the international environment resembles that of the London Club in the 1970s. While nuclear suppliers then met in the aftermath of the first Indian nuclear test, today this forum is an opportunity for nuclear-weapon states and major nuclear suppliers to negotiate universal standards for nonproliferation, safety, and security measures that may achieve international objectives without unfairly inhibiting each country's competitive interest in the civilian nuclear market.

Moreover, the P5 must play an integral role in Article IV conversations because climate change is increasingly recognized as a threat of the same magnitude as nuclear holocaust. As long as peaceful nuclear power is part of the solution, the nuclear-weapon states must be involved in its responsible implementation. If the United States and Russia were to present a united front on this issue, it could go a long way toward productive, consensus-based negotiations with non-nuclear-weapon states—including influential members of the Non-Aligned Movement—at future NPT review conferences.

True Partnership

Whatever forms of US-Russian cooperation on this issue may emerge, it is important to draw from lessons of previous success stories of mutual engagement—including the Cooperative Threat Reduction (CTR) program, which repatriated or destroyed Soviet warheads as well as nuclear material held by Soviet successor states following the collapse of the Soviet Union. The CTR program was originally proposed as an amendment to the US implementing legislation for the Conventional Armed Forces in Europe Treaty by US Senators Sam Nunn (D-GA) and Richard Lugar (R-IN), which allocated Defense Department funds to assist states formerly of the Soviet Union with the following:

- Destroying nuclear, chemical, and other weapons;
- Transporting, storing, disabling, and safeguarding weapons in connection with their destruction; and

- Establishing verifiable safeguards against the proliferation of such weapons.[62]

Originally intended as an emergency response to maintain control over sensitive material, the CTR program quickly grew into a wider initiative for nonproliferation and counterterrorism—the value of which became especially clear after the attacks of September 11, 2001, in the United States raised public concern about terrorist use of weapons of mass destruction. Programs evolved for border and export controls, warhead storage and security facilities, and dismantlement of retired delivery systems. By the time the CTR program's memorandum of understanding expired in June 2013 and was not renewed due to Russian opposition, the program had deactivated 7,616 warheads, destroyed 914 intercontinental ballistic missiles and 695 submarine-launched ballistic missiles, and eliminated 155 nuclear bombers.[63] In addition to these measurable accomplishments, the CTR program also produced less tangible rewards such as greater cooperation between US and Russian politicians, military leaders, and scientists. Although by no means perfect, cooperative relationships such as these were never thought possible during the days of the Cold War. Generally, the program of US financial and practical assistance to the former Soviet states was considered a success.

However, for all its achievements, the effectiveness of the CTR program was often hindered by the asymmetry between the two parties; from the US perspective, it was rarely seen as a partnership of equals. Within a decade of its creation, the US General Accounting Office (GAO) noted that the lack of access and transparency provided by Russia into some of its facilities housing nuclear weapons and materials resulted in slow progress in threat reduction efforts. This was largely due to major parts of the Russian bureaucracy being "still wary of the West and its interest in Russia's defense materials

[62] Mary Beth Nikitin and Amy Woolf, "The Evolution of Cooperative Threat Reduction: Issues for Congress," Congressional Research Service, November 23, 2015, https://fas.org/sgp/crs/nuke/R43143.pdf.
[63] "Nunn-Lugar CTR Scorecard," March 31, 2013, https://www.thelugarcenter.org/assets/htmldocuments/20130301_FY13_CTR-Scorecard_Slides_Mar13.pdf.

and facilities."[64] Furthermore, prior to deciding not to renew the agreement in 2012, Russian Foreign Ministry officials denounced it as "thoroughly discriminating."[65] Indeed, the Nunn-Lugar legislation was created at a time when Russia, newly emerged from the crumbling Soviet Union, lacked the political or financial resources to independently secure its nuclear weapons and material. Russia today, however, is not only able to finance its own containment and cleanup programs but appears more willing to do so than to allow US contractors and entities access to its military facilities. In response to Russian objections to the CTR program in 2012 and 2013, representatives of both the United States and Russia advocated the creation of a successor agreement rather than abandoning the joint effort altogether.[66] Whatever new agreement takes shape should be one of true partnership with equal burden sharing and authority.

Also to be addressed in a future US-Russian cooperative agreement in this area is the question of liability protection. Under the terms of the original CTR program, the lack of legal protections for liability matters of both donor and recipient entities was cited as a challenge that required more political attention.[67] As it became clear in 2013 that the CTR program would be scaled back, the United States and several European partners relied on the 2003 Framework Agreement on a Multilateral Nuclear Environmental Program in the Russian Federation (MNEPR) as the legal basis for continued threat reduction work, in which Western funds were provided to Russian facilities for radiological cleanup as well as nonproliferation projects. The MNEPR includes a protocol on claims, legal proceedings, and indemnification, which is designed to protect donor countries and institutions from liability and provide tax exemption for threat reduction assistance.[68] If the United States and Russia enter into any kind of agreement

64 Kenneth N. Luongo and William E. Hoehn III, "Reform and Expansion of Cooperative Threat Reduction," *Arms Control Today,* June 2003, https://www.armscontrol.org/act/2003-06/features/reform-expansion-cooperative-threat-reduction.

65 NTI, "Russia to Drop Cooperative Threat Reduction Deal with US: Report," October 10, 2012, https://www.nti.org/gsn/article/russia-drop-cooperative-threat-reduction-deal-us-report/.

66 NTI, "Russia to Drop Cooperative Threat Reduction Deal."

67 Luongo and Hoehn, "Reform and Expansion."

68 Nikitin and Woolf, "The Evolution of Cooperative Threat Reduction."

for technical collaboration on peaceful nuclear technology, this protocol may serve as a model to ensure equal burden sharing between parties.

Whatever form they may take, future agreements between the United States and Russia on the topic of civilian nuclear power will be most effective and enduring if the two signatories are treated as equal partners, capable of upholding their own end of the obligations under the agreement while cooperating for a common purpose.

Conclusion

Economic competition between the United States and Russia in the field of civilian nuclear power is not going to go away. In fact, officials in the Trump administration even stated that the State Department "intends to actively dissuade its partners from working with China and Russia" on nuclear development.[69] Under the Biden administration, the White House signaled early on its priority of continuing to compete in a global nuclear market, particularly through "promoting innovation to bring clean technologies to scale." This effort includes the launch of the Foundational Infrastructure for the Responsible Use of Small Modular Reactor Technology (FIRST) program. With an initial State Department investment of $5.3 million, this program aims to "provide capacity-building support to enable partner countries to benefit from advanced nuclear technologies and meet their clean energy goals."[70] This is more than a best practices capacity-building effort, however: the FIRST program is designed to allow US small-reactor vendors to compete with Russia and China in the broader nuclear geopolitical market. Meanwhile, Russia is unlikely to slow down its export of nuclear reactors and services as long as the industry brings valuable income to an economy that is otherwise highly dependent on the export of hydrocarbons, which are subject to major price fluctuations.[71] Nor should competition be discouraged, as many experts "see a strong nuclear industry as necessary to ensure high

69 DiChristopher, "The US is losing."
70 White House, "Fact Sheet: President Biden's Leaders Summit on Climate," April 23, 2021. https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/23/fact-sheet-president-bidens-leaders-summit-on-climate/.
71 Schepers, "Russia's Nuclear Energy Exports," p. 8.

standards of governance" over safety and security processes.[72] However, the current and future expansion of nuclear power around the world will be accompanied by increased risk of nuclear weapon proliferation, as well as internal safety and security concerns, which must be addressed.

Consequently, cooperation on ways to mitigate these concerns in spite of economic competition is necessary. Both the United States and Russia have a vested interest in the benefits cooperation may bring. Increasing trends of climate catastrophe affect Russian and US populations and territory, including strategic military resources and sites relevant to their nuclear missions. The United States and Russia are also major contributors to the carbon buildup in the atmosphere and therefore bear substantial responsibility for the current state of the climate. The Trump administration reversed a number of critical environmental regulations, thereby increasing the US contribution to the global crisis, and withdrew from the 2015 Paris climate agreement, in which the United States and 196 other countries had made a commitment to slowing and ultimately reversing these negative trends. The Biden administration and its successors will have the opportunity to accept more of this responsibility and rejoin the international effort to combat climate change. Advances in technology that produce safe, reliable storage of spent fuel and lower the cost of nuclear power plants through standardization may also affect the political attitudes toward nuclear power in the United States, making it a more viable component of a future US climate strategy.

Nuclear power is unique in its ability to replace fossil fuels at a high enough rate to reduce carbon emissions by the threshold identified by the IPCC as the "point of no return," and in combination with renewable alternatives must be a crucial element of any future climate solution. The United States and Russia should continue to be major proponents of nuclear power while working together to shape the future of the industry according to nonproliferation objectives.

Teamwork in parallel to competition between these two states has been feasible in the past, as illustrated by Soviet-US collaboration with respect to

[72] Schepers, p. 9.

the London Club. Between 1975 and 1978, an international standard for export controls was established among global nuclear suppliers thanks to the willingness of Soviet and US delegations to compromise and represent each other's interests in this area within a broader geopolitical context of opposition. Back then, US-Soviet teamwork was essential to bringing other nuclear suppliers on board. Today, a joint contribution to global security and sustainability by two of the world's largest carbon emitters, as well as the two largest nuclear powers, could go a long way toward influencing the behavior of other nuclear-weapon states.

Given the current state of relations between the US and Russian administrations, it is more realistic to focus on cooperation that takes place in a less formal scientific or technological environment. Scientists and experts from around the world already come together in communities such as the Generation IV International Forum, where their work may produce innovations to promote the safety and security of new technology, identify dual-use items subject to export controls, and even produce measures to reduce capital costs of nuclear power plants through standardization of design. Outreach to and the involvement of industry in this effort is critical, particularly within the evolving field of small modular reactors. The United States and Russia are well placed to lead these efforts and prioritize such innovations given their existing nuclear R&D infrastructures.

Outside scientific circles, collaborative dialogue between US and Russian policy makers has greater potential in multilateral forums than in a strictly bilateral context. In consensus-based forums such as the multilateral export control regimes, US-Russian unity is essential to producing real advancements that can serve as a basis of national policy. For example, the two powers could use their joint influence to recommend that nuclear suppliers in the NSG provide not only equipment and material, but possibly also security training in the form of workshops, technical expertise in drafting export control legislation, and customs training for nuclear newcomers. Of course, the United States and Russia, as the oldest nuclear-weapon states, should lead other NSG members in continuing to highlight the importance of the existing international nonproliferation regime with the NPT as its cornerstone, including the role played by IAEA safeguards.
The P5 Process is another potential venue for meaningful cooperation

between US and Russian policy makers. Its involvement of all the nuclear-weapon states under the NPT has the potential to produce cooperation similar to that of the London Club in the 1970s. The UK representative's recent statements on the importance of Article IV[73] may indicate that nuclear powers other than the United States and Russia are open to cooperation in this area. Additionally, the multilateral environment, less formal than legally binding NPT meetings, may facilitate agreements between the United States and Russia, as well as other nuclear suppliers, on best practices for nuclear exports.

Finally, US and Russian policy makers should consider jointly adding new security standards to the terms of their export contracts with emerging economies. A baseline of additional treaties that could provide these standards may include the Convention on the Physical Protection of Nuclear Material, the International Convention for the Suppression of Acts of Nuclear Terrorism, or the Convention on Nuclear Safety. As the London Club found in its efforts to apply export controls across the international nuclear market, universal standards mitigate risk without inhibiting individual competitiveness.

All of these measures would be most effective if implemented by all nuclear suppliers around the world, not just the United States and Russia. But these two countries in particular—as the oldest and largest nuclear powers; as two of the greatest contributors to climate change, which nuclear energy is being used to combat; and in the case of Rosatom, as the biggest player in the civilian nuclear supply market—would carry outsized influence through collaborative efforts to make the spread of peaceful nuclear power as secure as possible.

For a generation during the Cold War, the United States and Soviet Union's willingness to cooperate on arms control despite geopolitical rivalries likely saved the world from nuclear catastrophe. Today, cooperation between the United States and Russia on ensuring high nonproliferation, safety, and security standards in the peaceful use of nuclear energy can continue to prevent nuclear disasters while simultaneously contributing to a more sustainable planet. What former Secretary of State George Shultz—a former

[73] Statement by Ambassador Aidan Liddle.

Cold Warrior and an active member of the Climate Leadership Council until his death in 2021—and his co-authors have said in regard to China and the United States can also apply to the United States and Russia: namely, that climate policy does not need to become another source of conflict, but that the two great powers can use climate action as an opportunity to bring greater prosperity to the world.[74]

[74] James A. Baker III, George P. Shultz, and Ted Halstead, "The Strategic Case for U.S. Climate Leadership," *Foreign Affairs,* Vol. 99, No. 3 (May/June 2020), https://www.foreignaffairs.com/articles/united-states/2020-04-13/strategic-case-us-climate-leadership.

CHAPTER SIX

US-Soviet/Russian Cooperation on Article VI of the NPT

Nikolai Sokov

At a meeting with Japanese Foreign Minister Takeo Miki in September 1967, US Secretary of State Dean Rusk stated that "the United States is anxious to begin talks with the Soviet Union on both offensive and defense nuclear missiles. The Soviet Union has said it would discuss this matter but has not yet set a date. … The United States is deeply interested in making progress on this matter with the Soviet Union and is confident that we will."[1] This statement was characteristic of a time when the United States and the Soviet Union were actively negotiating the future Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and were at the same time preparing for bilateral negotiations to limit their strategic forces.

Cooperation between the United States and the Soviet Union played a pivotal role in negotiations on the NPT and remained a constant during the rest of the Cold War and after its end. The two countries also shared an attitude toward the treaty's Article VI, which deals with nuclear disarmament: they sought to limit its impact on their defense and arms control policies as they pursued more modest (and more practical) measures to limit the nuclear arms race and stabilize the strategic balance. In spite of numerous setbacks, the bilateral arms control process continued almost without interruption and was crowned in the last years of the Cold War by several treaties and less formal regimes that addressed the entire range of nuclear-capable delivery vehicles of both sides.

[1] Memorandum of Conversation, "Ryukyu Islands (Part I of II)," September 16, 1967, National Security Archive, George Washington University, https://nsarchive2.gwu.edu/NSAEBB/NSAEBB22/docs/doc17.pdf.

Paradoxically, cooperation weakened after the end of the Cold War. Although reduction of nuclear arsenals, which was triggered by agreements concluded between 1987 and 1993, continued and even accelerated, the bulk of these reductions were unilateral, and they slowed down to almost a halt in 2010s. This pattern suggests that the reductions were motivated more by the desire to optimize nuclear arsenals by removing excessive weapons inherited from the Cold War than by a perceived obligation to move toward complete elimination of nuclear weapons. Further, after the end of the Cold War, the United States and Russia demonstrated a surprising capability not to conclude treaties or bring them into force. The two countries spent more time without active negotiations than discussing new treaties.

This chapter explores the relationship between Article VI of the NPT and the behavior of the United States and the Soviet Union/Russia with respect to arms control negotiations. It seeks to answer the following questions:

- How and why did the United States and the Soviet Union accept obligations under Article VI?
- Was their decision to engage in arms control negotiations influenced by NPT negotiations?
- Did obligations under Article VI affect the propensity of the United States and the Soviet Union/Russia to engage in arms control talks and achieve meaningful agreement on reduction of their nuclear weapons?

The answers to these questions may help answer a tantalizing question that is perhaps central for understanding whether and how much the obligations nuclear-weapon states assumed under Article VI of the NPT affect their propensity to pursue elimination of nuclear weapons. A related question is whether non-nuclear-weapon states can tangibly leverage Article VI to facilitate and accelerate nuclear disarmament.

This chapter concludes, unfortunately, that the impact of Article VI on the United States and the Soviet Union/Russia has been minimal, perhaps even negligible. These two countries, which possess about 90 percent of all nuclear weapons, did indeed engage in negotiations, first to limit the growth of their nuclear arsenals and then to reduce them, but

this endeavor was primarily informed by the desire to stabilize mutual deterrence and prevent war.

Both countries fully understood the dangers associated with the continued existence of these weapons both for themselves and for humankind (and in this sense recognized the premise of Article VI). Nonetheless, at no point did they appear to seriously contemplate the complete elimination of these weapons. They began or discontinued negotiations depending on their perceived security needs and the changes in the domestic political landscape.

The pressure from non-nuclear-weapon states that sought to accelerate reduction of nuclear weapons and their elimination had a limited effect, if any. There have been periods when the United States and the Soviet Union/Russia seemed more responsive to that pressure—to the extent that they agreed to far-reaching programs of nuclear arms reduction and disarmament measures—but in the end, security concerns and domestic politics always trumped international pressures. Although they cooperated, with various degree of success, in reducing nuclear arsenals, they have also demonstrated quite a remarkable ability to cooperate in fending off the pressure of non-nuclear-weapon states within the NPT review process.

Development of US and Soviet Attitudes toward Disarmament in the Context of the NPT

Article VI of the Nonproliferation Treaty, which obligates states parties "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control," is regarded as one of the "pillars" of the nuclear nonproliferation regime. Simply put, the continued existence of the NPT is conditioned on the ability of nuclear-weapon states to demonstrate the implementation of their obligations under Article VI. Today, that relationship seems intuitive, but that was not always the case. It took several years for the United States and the Soviet Union to accept such a relationship.

The paths of the two superpowers to agreement with respect to nonproliferation and to the relationship between nonproliferation and disarmament were different. Put succinctly, the United States from the

beginning considered the nonproliferation regime a global norm; its path toward the NPT was straighter (although not without diversions), and the disarmament plank was regarded as the price for obtaining the agreement of non-nuclear-weapon states to such a regime. The Soviet perception of the nonproliferation regime was initially narrower and more instrumental; it regarded nonproliferation as a precondition for arms control. Where the views of the two countries overlapped from the very beginning was in their desire to avoid firm nuclear disarmament obligations even as they paid lip service to the principle.

The beginning of the US and Soviet path toward nuclear nonproliferation can be traced to the late 1950s—in particular, the two Irish resolutions at the UN General Assembly in 1958 and 1959.[2] The first of the two expressed concern about the proliferation of nuclear weapons and proposed a special committee to explore its dangers. The second resolution contained a recommendation to pursue negotiations on a verifiable treaty that would ban nuclear-weapon states from transferring nuclear weapons to states that did not possess them and banned non-nuclear-weapon states from producing these weapons. The Soviet Union supported the former resolution but abstained on the second[3] while the United States abstained on the former and supported the latter. The Soviet Union explained its position on the 1959 resolution by expressing concern that the resolution did not preclude the basing of nuclear weapons outside the national territories of nuclear-weapon states.[4] One of Soviet negotiators who made a major contribution to negotiation and subsequent implementation of the NPT, Roland Timerbaev, however, dates Soviet support for nonproliferation to an even earlier date—1957, when the Soviet Union introduced a resolution at the UN General Assembly that prohibited nuclear-weapon states from deploying nuclear weapons outside their national territories or transferring nuclear weapons to other states.[5] The Soviet Union did not elaborate its attitude toward the principle of nuclear nonproliferation

[2] For the history of the Irish Resolutions see Mohamed Shaker, *The Nuclear Nonproliferation Treaty* (London: Oceana Public, 1980), p. 3.

[3] Only paragraph 2 of the 1958 resolution, which expressed concern about proliferation of nuclear weapons, was put to a vote.

[4] Roland Timerbaev, *Rossiya i Yadernoe Nerasprostranenie* [Russia and Nuclear Nonproliferation] (Moscow: Nauka, 1999), p. 167.

[5] Timerbaev, *Russia and Nuclear Nonproliferation,* p. 164.

and overall, its approach could best be described by the well-established belief that the primary motive for its nonproliferation policy at this early stage was desire to prevent access of US allies to nuclear weapons.

The Kennedy administration moved quickly on the development and the promotion of nuclear nonproliferation, beginning no later than National Intelligence Estimate (NIE) 4-3-61 in September 1961.[6] The findings of NIE 4-3-61were amplified and expanded in 1963 with the famous analysis of Secretary of Defense Robert McNamara, which predicted eight states with nuclear weapons by 1973 and a subsequent increase of that number by a factor of two to five.[7] That analysis was confirmed and further substantiated a few months later in NIE 4-63.[8]

Probing for possible Soviet support for nuclear nonproliferation became an integral part of US policy early on. For example, Rusk reported on an exchange of views he had with Soviet Foreign Minister Andrey Gromyko in the spring of 1962.[9] An important conversation between Rusk and Gromyko took place in July 1962 in Geneva;[10] the exchange was considered so sensitive that it was not included in the regular memorandum of conversation and instead was classified as "limited

6 "Nuclear Weapons and Delivery Capabilities of Free World Countries Other Than the US and UK," National Intelligence Estimate (NIE) 4-3-61, September 21, 1961, *Foreign Relations of the United States* (FRUS), 1961-1963, Vol. VII, Document 243, https://history.state.gov/historicaldocuments/frus1961-63v07-09mSupp/d243.

7 "The Diffusion of Nuclear Weapons with and without a Test Ban Agreement," memorandum from US Defense Secretary Robert McNamara to President John F. Kennedy, February 12, 1963, Digital National Security Archive (DNSA), document no. NP00941.

8 "Likelihood and Consequences of a Proliferation of Nuclear Weapons Systems," NIE 4-63, June 23, 1963, History and Public Policy Program Digital Archive, Wilson Center, CIA Mandatory Review Release (originally published in William Burr, ed., National Security Archive Electronic Briefing Book #155, June 1, 2005), https://digitalarchive.wilsoncenter.org/document/115992.

9 Memorandum of NSC Discussion, March 28, 1962, FRUS, Vol. VII, Document 116, https://history.state.gov/historicaldocuments/frus1961-63v07-09mSupp/d116.

10 Memorandum of Conversation, "Disarmament and Related Topics," Geneva, July 24, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 198, https://history.state.gov/historicaldocuments/frus1961-63v07/d198.

distribution" reaching only a select list of recipients.[11] Two subsequent meetings between Rusk and the Soviet ambassador to the United States, Anatoly Dobrynin, resulted in an agreement on two key elements of the future nonproliferation regime: the obligation of nuclear-weapon states to refrain from transferring nuclear weapons and the obligation of non-nuclear-weapon states to refrain from developing and producing nuclear weapons. The Soviet Union added the third element, a ban on the transfer of nuclear weapons through military alliances.[12]

The US policy of engaging European NATO allies in the mission of nuclear deterrence of the Soviet Union, which began under the Eisenhower administration in the late 1950s, remained a major stumbling block for US-Soviet cooperation on nuclear nonproliferation for several years. The multilateral nuclear force (MLF) foresaw Polaris missiles carried by submarines and surface ships that were manned by representatives of NATO countries and operating under a NATO command.[13] MLF de facto would have created a truly multilateral force and was intended in part to prevent proliferation impulses on the part of US allies in Europe.[14] At the December 1962 meeting of NATO foreign ministers, where the United States sought to push a consensus position that would deny "any state which is a member

[11] Memorandum of Conversation, Meeting of Committee of Principals, "Nuclear Test Ban," July 26, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament (hereafter cited as "Test ban conversation, July 26, 1962"), Document 201, footnote 6, https://history.state.gov/historicaldocuments/frus1961-63v07/d201#fn:1.5.6.2.596.66.4.

[12] Memorandum of Conversation, "Non-Diffusion of Nuclear Weapons," August 8, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 216, https://history.state.gov/historicaldocuments/frus1961-63v07/d216; Memorandum of Conversation, "Non-Diffusion of Nuclear Weapons," August 23, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 222, https://history.state.gov/historicaldocuments/frus1961-63v07/d222.

[13] The MLF has not attracted much attention of scholars. An excellent detailed description of the MLF can be found in James B. Solomon, "The Multilateral Force: America's Nuclear Solution to NATO (1960-1965)" USNA—Trident Scholar Project Report 269, US Naval Academy, 1999, https://apps.dtic.mil/dtic/tr/fulltext/u2/a375751.pdf.

[14] Memorandum of Meeting with President Kennedy, "Disarmament Negotiations," July 30, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 206, https://history.state.gov/historicaldocuments/frus1961-63v07/d206 (hereafter cited as "Disarmament meeting with Kennedy, July 30, 1962").

of the regional arrangement and which does not possess nuclear weapons the ability to make a determination to use these weapons on the basis of its national decision alone" but would not prevent the weapons from being "in the custody of units of a multinational defense force."[15]

The Soviet Union was alerted to the US position prior to the NATO ministerial meeting; during a meeting with Dobrynin in the run-up to the ministerial, Rusk clearly indicated that such an arrangement "would not be implemented until both the Soviet Union and the United States were satisfied that all potential nuclear powers had adhered."[16] The Soviet Union, however, remained highly critical of MLF plans and was convinced that it opened the door for West Germany's access to nuclear weapons. As noted above, the Soviet nonproliferation initiative in 1957 was at least in part—if not primarily—motivated by the desire to prevent exactly that outcome.

In the end, the MLF could not be sustained. Not only did it meet with outright rejection from the Soviet Union and make the launch of NPT negotiations impossible, it also was rejected by key US allies France and the United Kingdom. In a 1965 report, the so-called Gilpatric Committee,[17] which was created to set the nonproliferation policy of the United States, clearly pointed at the contradiction between the principle of nonproliferation and the MLF. The committee recommended, albeit in cautious terms, that the choice be made in favor of the former, although it took another year for that recommendation to become policy. There can be little doubt that Soviet opposition to the MLF played a role: a nonproliferation regime was unthinkable without Russia's participation, but Moscow would not join until the MLF had been abandoned.

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15 Editorial note, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 249, https://history.state.gov/historicaldocuments/frus1961-63v07/d249.

16 Memorandum of Conversation, "Nontransfer of Nuclear Weapons," December 10, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 248, https://history.state.gov/historicaldocuments/frus1961-63v07/d248.

17 "Report by the Committee on Nuclear Proliferation," January 1, 1965, FRUS, 1964-1968, Vol. XI, Arms Control and Disarmament, Document 64, https://history.state.gov/historicaldocuments/frus1964-68v11/d64.

Available documents, including declassified ones, do not provide clear evidence on how the Kennedy administration conceptualized the relationship between nuclear disarmament and nonproliferation. President John F. Kennedy's speech before the UN General Assembly in 1961 conceived of nonproliferation as an element of a broader disarmament agenda, which included banning nuclear testing, ending production of fissile materials for weapons, preventing the placement of nuclear weapons in space, and eventually, as the last step, completely eliminating nuclear weapons.[18]

Interestingly, the Committee of the Principals—the Cabinet-level interagency group led by the national security adviser, McGeorge Bundy—at its meeting in July 1962 apparently saw nonproliferation as a means of engaging the Soviet Union in discussions of a test ban.[19] Declassified documents from that period produce an impression that US policy makers did not perceive any special relationship between nonproliferation and disarmament; they preferred to move on both fronts but did not necessarily see them as a package and would accept progress on either of them without requiring progress on the other.

The Soviet Union's path toward nonproliferation is commonly conceptualized in a different way. Its interest is believed to have been narrower and more instrumental with the main interest, at least initially, being prevention of West Germany's access to nuclear weapons, and this interest only gradually transforming into support for a global regime. There are undoubtedly reasons for that point of view. The Soviet Union consistently raised this issue in all international forums and in bilateral meetings with the United States. The US-Soviet dialogue on nonproliferation began in earnest after the above-referenced series of bilateral meetings, beginning with the Rusk-Gromyko conversation in Geneva in July 1962 and continuing with several Rusk-Dobrynin meetings. In a memorandum to Kennedy prior to the NATO ministerial meeting where nonproliferation and the MLF were discussed, Rusk made the following observation:

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18 "Address before the General Assembly of the United Nations," September 25, 1961, John F. Kennedy Presidential Library, https://www.jfklibrary.org/archives/other-resources/john-f-kennedy-speeches/united-nations-19610925 (hereafter cited as "Kennedy UN address").
19 Test ban conversation, July 26, 1962.

> At the last meeting, August 23, a potentially important shift occurred in the Soviet position. The Soviet Union now appears willing to consider reaching an agreement on non-diffusion couched in more general terms than its previous position which had specified that a prior agreement had to be reached separately concerning the specific problem of the Federal Republic of Germany and of the East German regime.[20]

Timerbaev,[21] however, argued that the Soviet concern was not limited to West Germany and that it objected to the entire MLF concept. The Soviet Union wanted to remove any chance that nuclear powers might give control of nuclear weapons to their allies. Although NATO and, more specifically, West Germany were at the center of this policy, it also applied to other alliances that the United States headed at that time, such as Southeast Asia Treaty Organization (SEATO) and the Central Treaty Organization (CENTO, also known as Baghdad Pact).[22] The Soviet Union itself refused to share nuclear weapons with its allies and suppressed nuclear programs that were launched by some of them, such as East Germany and Romania.

Soviet policy can also be interpreted in a different way, however. It can be viewed as consistent advocacy of nuclear nonproliferation as a global norm, of which the issues of West Germany and the MLF were only specific applications of a principle that was at the center of attention in the late 1950s and early 1960s. The first Soviet initiative in 1957 and the discussion at the Rusk-Dobrynin meeting on August 23, 1962, make this a credible explanation.

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[20] Memorandum from Secretary of State Rusk to President Kennedy, "Agreement on Non-Diffusion of Nuclear Weapons," November 27, 1962, FRUS, 1961-1963, Vol. VII, Arms Control and Disarmament, Document 247, https://history.state.gov/historicaldocuments/frus1961-63v07/d247.

[21] Timerbaev, *Russia and Nuclear Nonproliferation.*

[22] Both SEATO and CENTO were modeled after NATO. SEATO was formed in 1954 and consisted of Australia, France, New Zealand, Pakistan, the Philippines, Thailand, the United Kingdom, and the United States. That alliance also guaranteed the security of two additional states, Laos and South Vietnam, which were prevented from joining alliances by the 1964 Geneva Agreements, which ended the Indochina War and provided for the independence of former French colonies in the region. CENTO was formed in 1955 and consisted of Iran, Iraq, Pakistan, Turkey, and the United Kingdom. Although the United States played a crucial role in the establishment of CENTO, for political reasons it joined its military organization only in 1958.

Choosing among these three hypotheses is difficult, in no small measure because available archival documents do not provide clear guidance. Much of Soviet policy was made in private and official decisions and policy guidance rarely offered a glimpse into rationales that were discussed at high levels; instead, they were usually couched in formal, heavily ideological terms. There can be no doubt, however, that, at the very least, concern about possible West German access to nuclear weapons, as well as about the MLF and its variants, played an important and perhaps catalytic role in Soviet support for the nonproliferation norm. A universal nonproliferation regime could not only end the MLF, but also prevent reemergence of similar ideas in the future. There can be little doubt that the evolution of Soviet views on the value of nonproliferation was gradual, and the end of that evolution can be timed with considerable precision from the end of 1964 to early 1965. In January 1965, the Soviet Union, together with East Germany, proposed a draft nonproliferation treaty to its allies at the meeting of the Political Consultative Committee (a summit meeting) in January 1965 in Warsaw.[23] Because of Romania's opposition, the draft was not adopted, and in the fall of the same year, Moscow introduced it as its own proposal at the UN General Assembly. The emergence of a draft text in January 1965—and especially jointly with another country—can only mean that work began no later than in the fall of 1964. The timing agrees with the chronology of MLF developments: 1964 was perhaps the year when the idea enjoyed the greatest enthusiasm in Washington and other NATO capitals and appeared to be on track to success. It may seem paradoxical that Soviet support for the nuclear nonproliferation regime was stimulated by US plans to allow its allies access to nuclear weapons, plans that were justified in part as a way to reduce the risk of proliferation. But history sometimes works in strange ways, and in any event, giving US allies access to nuclear weapons was not regarded by Moscow as an acceptable price for preventing their indigenous nuclear programs. Thus the path for Soviet participation in NPT negotiations was opened only after the United States abandoned MLF plans in 1966.

The MLF controversy was resolved through a compromise: in place of the MLF, the United States and its allies developed the concept of "nuclear sharing." Under this approach, allies would not have access to nuclear

[23] Timerbaev, *Russia and Nuclear Nonproliferation,* p. 238.

weapons but would participate in nuclear missions in wartime and train for these missions in peacetime. The Soviet Union did not object to that deal,[24] but there is no evidence it saw it as fully acceptable either—just a price to pay for the NPT and a guarantee that the suspected nuclear aspirations of US allies would not go further. For the United States it was also a compromise: it was politically difficult if not impossible to completely abandon earlier plans, but nuclear sharing as it emerged in 1966 had a greater nonproliferation component than the original MLF. The issue would reemerge in Russian policy after the Cold War when Soviet nuclear weapons would be withdrawn from territories of Warsaw Pact countries.

There is no evidence that Soviet leaders initially perceived a relationship between nuclear nonproliferation and disarmament. Soviet advocacy of nuclear disarmament dates back to the very beginning of the nuclear era and acquired greater prominence in the 1950s, preceding the international push for a nonproliferation regime. It remained an independent policy until it became necessary to include a disarmament provision into the NPT.

Such a relationship began to be conceptualized as NPT negotiations progressed, but it was apparently the opposite of Article VI. Speaking with Romanian leader Nicolae Ceaușescu in 1967, Soviet leader Leonid Brezhnev said that the NPT would "significantly change the political situation and its elements may serve as a solid step toward further struggle for reducing the production of nuclear arms and complete disarmament."[25] In this context, Brezhnev mentioned a US proposal on limiting deployment of missile defenses, which, he said, was intended by Washington to avoid a new arms race.

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[24] On the history of US-Soviet/Russian negotiations with respect to "nuclear sharing" and its relationship to the NPT, see William Alberque, "The NPT and the Origins of NATO's Nuclear Sharing Arrangements," IFRI Proliferation Papers No. 57, February 2017, https://www.ifri.org/en/publications/etudes-de-lifri/proliferation-papers/npt-and-origins-natos-nuclear-sharing-arrangements. The paper is thoroughly researched, but its conclusion about Soviet "acceptance" of nuclear sharing appears questionable.

[25] "Zapisi Besed L. Brezhneva s Ministrom Inostrannykh Del SRR K. Menesku, s N. Chaushesku, i I.G. Maurerom, Rukopisnye Zametki L. Brezhneva, sdelannye vo Vremya Besedy, Poslaniya L. Brezhneva" [Memorandums of Conversation of L. Brezhnev with C. Mănescu, N. Ceaüescu, and I.G. Maurer, L. Brezhnev's Handwritten Notes Made During Conversations, Messages by L. Brezhnev], RGANI, Fund 80, File 1, Case 761. The document was shared with the author by Dr. Sergey Radchenko of Cardiff University.

In other words, Brezhnev postulated what might be called "reverse conditionality": instead of an Article VI approach that can be summarized as "disarmament is a condition for nonproliferation," Brezhnev adhered to the idea that nonproliferation is a condition for disarmament and arms control. At stake here was not only nuclear disarmament as a distant and vague notion, but also more limited and practical cooperation with the United States in reining in the nuclear arms race, which began only two years later. This view was also different from the initial US perception of nonproliferation as an element of a broader package that included arms control and disarmament (and, by implication, allowed progress on one independently of the other).

It should be noted that it is difficult to know the views of the top level of Soviet leadership, the Politburo of the Communist Party, in detail. Statements like the one quoted above were rare and the Politburo never engaged in an in-depth, conceptual discussion of issues pertaining to nonproliferation and disarmament.[26] As a rule, Soviet leaders limited their role to the approval of instructions for Foreign Ministry negotiators (which, of course, were previously approved at the interagency level). The structure of the decision-making mechanism coupled with the absence of evidence of sustained Politburo interest in nonproliferation and disarmament issues suggests that details of policy in that area were primarily developed by a handful of high-level officials (first of all Brezhnev, who, according to all memoirs, took a close and personal interest in matters of international security) and the Foreign Ministry—perhaps with occasional participation of other agencies—which supplied analysis and proposals for positions at negotiations. Subsequent arms control talks with the United States saw much closer engagement of other agencies, especially the Ministry of Defense and the defense industry.

Nonproliferation and Disarmament during NPT Negotiations

In contrast to the United States and the Soviet Union, non-nuclear-weapon states from the very beginning saw a nuclear disarmament clause

[26] Dr. Radchenko, who had an opportunity to thoroughly research Politburo archives from the 1960s and 1970s, commented to the author that these issues were barely raised at the highest level of the Soviet Union.

as essential for the future nonproliferation regime and rejected the prospect of the future treaty permanently relegating them to "second-class" status. Without a disarmament provision, it would have indefinitely enshrined the continued existence of nuclear weapons, which was unacceptable as a matter of principle because it threatened the survival of humankind. Moreover, it would have indefinitely left these weapons in the hands of a handful of states that were economically and militarily powerful or had launched nuclear weapon programs early enough. For non-nuclear-weapon states, Article VI was a compromise: it implicitly accepted the status quo as a temporary solution—one could not realistically expect that nuclear-weapon states would part with their most powerful military and political asset in the near future—but maintained pressure on them to ensure that these weapons would not exist indefinitely.

Thus, the superpowers, on the one hand, and non-nuclear-weapon states, on the other, adhered to opposite views on the relationship between nonproliferation and disarmament. Whereas the former postulated that there would be no disarmament without nonproliferation, the latter insisted there would be no nonproliferation without disarmament. Article VI helped bridge that gap for the purposes of finalizing the NPT but failed to resolve the difference in philosophies, making conflicts over the nuclear-weapon states' Article VI implementation record inevitable.

The first proposal to include an operative article about nuclear disarmament into the future treaty was made by the United Arab Republic[27] in March 1966, at a very early stage of negotiations. In August 1966, eight members of the Non-Aligned Movement declared that the future treaty should be "accompanied by substantive steps toward ending the nuclear arms race as well as limitation, reduction, and elimination of nuclear weapons stockpiles and the means of their delivery."[28] These views could not be ignored by the United States and the Soviet Union.

The two superpowers were not enthusiastic about accepting an obligation to eliminate nuclear weapons. They were locked in an all-encompassing

[27] The United Arab Republic was initially established in 1958 as a union of Egypt and Syria, but after Syria left in 1961, Egypt retained the name until 1971.
[28] Timerbaev, *Russia and Nuclear Nonproliferation,* pp. 307-308.

conflict in which nuclear weapons were both a security guarantee and a tool for expansion of influence; these weapons guaranteed their special status in the international system. Yet, their interest in the NPT led them to accept the need to make a concession to non-nuclear-weapon states. Reflecting the acceptance of that linkage, a memorandum by Adrian Fisher, the director of the US Arms Control and Disarmament Agency (ACDA), in May 1967, listed steps needed to address concerns of non-nuclear-weapon states. According to the memo, "It is agreed that non-nuclear states would find it easier to sign an NPT if there were stronger evidence of the nuclear countries' intent to move seriously to halt and reverse the arms race."[29] He noted that the Soviet Union shared that understanding with respect to the of inclusion of language on nuclear disarmament.

Initially, the United States and the Soviet Union agreed that reference to elimination of nuclear weapons would be contained in the preamble to the future treaty; if it were not part of operative part of the text, it could hardly be considered binding. They intended to make it a broad political statement about intention rather than a hard promise. The language drafted by the United States for the preamble was quite vague. (As in many other instances, the United States took the initiative in drafting text.) That language foresaw a two-part promise about cessation of the nuclear arms race "at the earliest possible date" and elimination of nuclear weapons and their delivery vehicles "pursuant to a treaty on general and complete disarmament."[30] The Soviet Union agreed on the thrust of these proposals. Final language agreed by the two parties and submitted to the UN Eighteen-Nation Disarmament Committee (ENDC) in August 1967 contained only small changes to that text: in addition to the original US proposal, it called for the cooperation of all states and mentioned reduction of international tensions and trust

[29] Adrian S. Fisher, "ACDA Views on Suggested Actions That Might Be Taken to Meet Concerns of NPT Signatories," May 23, 1967, National Security Archive, George Washington University, https://nsarchive.gwu.edu/dc.html?doc=4476030-Document-03-Adrian-Fisher-to-Henry-Owen-S-P.

[30] US Department of State, "Interpretations Regarding Draft Non-Proliferation Treaty Formulations, ACDA," February 22, 1967, Wilson Center Digital Archive, https://digitalarchive.wilsoncenter.org/document/177794.

building as a stage toward nuclear disarmament. The text retained the reference to general and complete disarmament.[31]

The plan did not succeed. In September, Mexico proposed to include a disarmament provision into the main text of the treaty as a new article, to which both the United States and Russia had to agree. There were other proposals to that end, but it was Mexico's draft that served as the point of departure for the future Article VI, with redrafting done by the United States. According to the correspondence between the US delegation and Washington, the Soviet Union largely accepted that redrafting; the only substantive objection raised by Soviet diplomats was against the use of the word "verifiable," which the US text applied to future nuclear disarmament as well as general and complete disarmament.[32] That correction was to be expected, given the generally negative Soviet attitude toward intrusive verification and especially on-site inspections.[33]

At the signing of the NPT on July 1, 1968, President Lyndon Johnson declared that the treaty laid the groundwork for steps to end the nuclear arms race. This represented a recognition, at the highest political level, of the inextricable relationship between nonproliferation and disarmament. Whether these negotiations were in fact conducted with an eye to the implementation of Article VI—that is, informed by the vision of a

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31 The United States and the Soviet Union submitted identical draft texts of the NPT as documents ENDC/192 and 193. The text can be found in US Arms Control and Disarmament Agency, *Documents on Disarmament 1967,* July 1968, pp. 338-341, http://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/publications/documents_on_disarmament/1967/DoD_1967.pdf; and UN General Assembly, "Report of the Conference of Eighteen-Nation Committee on Disarmament," UN Document A/7072, Annex I, March 19, 1968, https://undocs.org/A/7072.

32 "Discussion with Soviets on Mexican Amendments," cable from US Mission to Geneva, Ref. Geneva 1211, October 10, 1967 https://nsarchive.gwu.edu/dc.html?doc=4476046-Document-18-U-S-Mission-Geneva-telegram-1140-to; Co-Chairmen's Meeting, October 7, cable from US Mission in Geneva, Ref. State 49458, October 7, 1967 https://nsarchive.gwu.edu/dc.html?doc=4476043-Document-15-State-Department-telegram-49458-to-U.

33 The only time the Soviet Union had agreed to on-site inspections was in the context of negotiations on the nuclear test ban in the 1950s—and then only to a low number (three). The United States proposed a greater number of inspections and the Soviet agreement to inspections was withdrawn. The next time it agreed to intrusive verification was in the context of negotiations on the INF Treaty in the late 1980s.

nuclear-weapon-free world—is a different matter. As the next section will demonstrate, the actual relationship between Article VI and the US-Soviet arms control process was rather tenuous.

The Path Toward Arms Control: The Relationship between the NPT and SALT

As NPT negotiations progressed, the United States and Russia were moving in parallel toward the first bilateral arms control negotiations. Prior to that, together with the United Kingdom, they had concluded the Partial Test Ban Treaty of 1963, which banned nuclear explosions in the atmosphere, in outer space, and underwater. This was relatively low-hanging fruit in the sense that key parameters had been agreed upon before the Cuban Missile Crisis and the remaining disagreements (first and foremost on the limitations on underground testing) were quickly dropped when the parties wanted to move ahead on an arms control agenda after coming close to nuclear war. Bilateral negotiations about limiting their nuclear forces were a different matter; those talks directly addressed the core of international security and potentially opened way to elimination of nuclear weapons. The bilateral format is also central to the goal of nuclear disarmament simply because the United States and the Soviet Union—Russia in the post-Cold War period—possess the vast majority of the global nuclear weapon stockpiles and any movement toward the elimination of these weapons depends on progress by Russia and the United States on this front.

The relationship between these negotiations and the NPT can thus illuminate the extent to which the NPT and disarmament are connected. If these two countries have been primarily motivated by their obligations under Article VI of the NPT, then they must have been responsive to pressure from non-nuclear-weapon states in the context of the NPT review process and their arms control efforts were informed by the ultimate goal of eliminating nuclear weapons. (At a certain stage, the process is supposed to become multilateral, obviously.) If, however, they have continued to view nuclear weapons as essential for their security and their negotiations were informed by more limited goals, such as strategic stability at low levels, then the relationship between Article VI and the nonproliferation regime must be judged weak and the leverage non-nuclear-weapon states have with respect to achieving elimination of nuclear weapons also must be considered very limited.

The road to the first bilateral US-Soviet negotiations, which culminated in the 1972 Interim Agreement on Certain Measures with Respect to the Limitation of Offensive Arms (commonly known as SALT I) and the Anti-Ballistic Missile (ABM) Treaty, offers the first test that should allow choosing between these two hypotheses. At first glance, NPT negotiations and SALT prenegotiations seemed closely synchronized. Tentative discussions about future talks began in the spring of 1966, shortly after NPT negotiations in the ENDC format began. More in-depth conversation about the scope of the future arms control treaty—effectively, the prenegotiation phase—took place during a meeting between President Johnson and Soviet Premier Alexei Kosygin in Glassboro, New Jersey, in June 1967, shortly before the two countries tabled a joint draft of the NPT. The parties also agreed to officially begin negotiations soon after the signing of the NPT. The formal announcement of the intention to begin SALT I negotiations and the opening official session of the new talks were supposed to take place in August 1968 during a visit by Johnson to the Soviet Union. (The talks were postponed when the Soviet Union sent troops to Czechoslovakia and began only in the fall of 1969.) Moreover, a letter from Johnson to Kosygin in May 1968 explicitly linked the two issue areas. Referencing the discussion of the NPT at the UN General Assembly, Johnson proposed that "the two governments announce early in the course of the General Assembly debate that they have agreed to begin bilateral negotiations on an agreement to limit strategic offensive and defensive missiles."[34]

Yet, a closer look at the preparatory stage for SALT I negotiations in the run-up to and during negotiations on the NPT indicates that the relationship between the two processes was weak, at best. It is difficult to say whether the United States and the Soviet Union would have engaged in SALT I talks without success in the NPT negotiations, but the probability of such a course of events is hardly zero.

Central to understanding SALT I and subsequent talks is the distinction between disarmament and arms control. The two notions may overlap, but they differ in their motivations and ultimate goal. The former refers to

[34] Letter from President Johnson to Chairman Kosygin, May 2, 1968, FRUS, 1964-1968, Vol. XI, Arms Control and Disarmament, Document 237, https://history.state.gov/historicaldocuments/frus1964-68v11/d237.

complete elimination of nuclear weapons. The parties may move toward that goal in stages, but the underlying purpose is a world without nuclear weapons. The latter is primarily about reducing the probability of large-scale war through enhancement of the stability of the military balance achieved through denial of the capability to win a war. Where nuclear weapons are concerned, this principle is operationalized as the absence of the capability to launch a disarming first strike, which would deny the other side ability to inflict unacceptable damage in response to aggression. Put differently, arms control is informed by national security achieved through strengthened deterrence and pursued through cooperation and coordination instead of unilateral actions.

Arms control may include reductions, which could be conceptualized as stability at lower levels. Yet, five decades after initiation of arms control talks, when nuclear arsenals have been reduced to a fraction of their Cold War levels, there is still no evidence that the United States and the Soviet Union as well as Russia after it have seriously contemplated reduction to zero. Arms control may be compatible in principle with nuclear disarmament, but only in cases in which nuclear-weapon states and their allies conclude they no longer need nuclear weapons to ensure their security. This has not happened so far. Instead, at different periods of time, the United States and the Soviet Union or Russia relied on nuclear weapons to deter the perceived superiority of the other side in conventional armed forces. The link between nuclear and conventional weapons makes achievement of nuclear disarmament as a result of an arms control process unlikely.

That said, there is an overlap between disarmament and arms control, especially if the former is pursued through staged reductions. In fact, this is how disarmament was conceptualized in Kennedy's speech before the UN General Assembly in 1961. This is also how the vision behind the program of nuclear disarmament that Soviet leader Mikhail Gorbachev proposed in 1986. In both cases, however, practical steps in the implementation of these programs were limited to arms control—that is, they stopped far short of the full implementation of the end goal.

It is worth keeping in mind, however, that the staged approach to nuclear disarmament may implicitly or explicitly assume the need to maintain military stability at each stage. In this sense arms, control instruments and

principles may be used to achieve disarmament ends. On the other hand, this overlap also creates an opportunity to "sell" arms-control-style reductions as steps toward implementation of Article VI—an opportunity the United States and the Soviet Union, later Russia, have amply used.

The prenegotiation stage of SALT I, which coincided with NPT negotiations, was primarily devoted to determining which classes of weapons would be discussed at future talks (offensive, defensive, or both) and the relationship between them. There is no evidence that the goal of eventual elimination of nuclear weapons was at any point raised in the bilateral context. This serves as an indication that the parties were informed by arms control rather than disarmament goals.

The first contacts took place in 1964, when Washington probed the Soviet attitude toward a freeze on strategic nuclear weapons as well as missile defense (which neither side had at that time, but both were working on it). This probing was consistent with the agenda of arms control and disarmament that had been developed under the Kennedy administration. An internal discussion of practical steps for the implementation of the first stage of the disarmament proposal contained in Kennedy's UN speech[35] foresaw a freeze on the number of delivery vehicles as well as a de facto ban on the introduction of new types of delivery vehicles: the proposal only allowed for one-for-one replacement of delivery vehicles of each type. The proposal also contemplated proportionate reductions, which effectively meant that the nuclear balance would remain the same as at the moment the agreement is concluded.[36]

The Soviet Union firmly and even angrily rejected that proposal,[37] which was hardly surprising: in the early 1960s the Soviet Union was still far behind the United States in the number of strategic delivery vehicles and was only approaching a new generation of ICBMs (land-based strategic missiles)—those based in silos, which helped vastly enhance their survivability. Obviously, a freeze, which would have locked the Soviet Union into both

35 Kennedy UN address.
36 "Disarmament meeting with Kennedy, July 30, 1962."
37 Viktor Starodubov, *Superderzhavy XX veka* [Superpowers of the 20th Century] (Moscow: OLMA, 2001), p. 218.

quantitative and qualitative inferiority was unacceptable. The rejection of the US initiative was another confirmation that at least the Soviet Union was motivated by an arms control logic—the logic of strategic balance and stable deterrence based on the assured retaliatory capability. Moscow agreed to negotiations only in the end of the 1960s when it had approached rough parity with the United States and it became possible to seek equal limits. Similarly, the initial US proposal, which de facto sought to freeze the (temporary) superiority over the Soviet Union instead of proposing reductions to an equal limit, proceeded from the same logic, too.

The next US attempt to discuss future talks took place in the spring of 1966 and was initially limited to discussion of missile defense. According to Viktor Starodubov, who in the 1970s and early 1980s was a leading figure on arms control in the General Staff and after 1986 covered the same issues for the Central Committee of the Communist Party of the Soviet Union, the first, very preliminary exchanges on possible arms control engagement took place in the summer of 1964. At that time, the United States was exploring the feasibility of a freeze on strategic weapons. The Soviet Union flatly rejected that approach because, Starodubov wrote, this would have resulted in a permanent "tenfold superiority" of the United States.[38] He writes that the first serious contacts took place in April 1966, when McNamara met with Dobrynin and proposed that two countries discuss limits or a ban on missile defense systems to preserve mutual assured destruction and avoid a new arms race.[39]

Dobrynin, however, wrote that this was not the first probing by the US side: there was also a series of meetings with ACDA Director William Foster, at which the latter informally explored negotiations on missile defense. The last in a series of these meetings took place in January 1966, according to Dobrynin. In March 1966, Dobrynin, acting on instructions from Moscow, told Foster that discussion of missile defense had to be held in conjunction with offensive weapons and in the context of "general and complete disarmament."[40] The latter reference, explained Dobrynin, was included because the Soviet leadership could not quite make a definitive decision on its

38 Starodubov, *Superpowers of the 20th Century,* p. 217.
39 Starodubov, p. 218.
40 Anatoly Dobrynin, *Sugubo Doveritel'no* [In Confidence] (Moscow: Avtor, 1996), pp. 133-134.

approach to arms control. During the April 1966 meeting with McNamara, the secretary of defense also emphasized the need to limit missile defense, but, according to Dobrynin's notes, also cautiously proposed that the United States and the Soviet Union jointly explore "a mutual understanding" with respect to both offensive and defensive weapons.[41] He was prepared to travel to Moscow to explain his proposal and the rationale, but the Soviet side did not accept the offer, which Dobrynin regretted. This was easy to explain because the Soviet leadership had just given a response to Foster's proposal and could not be expected to change it so quickly. In spite of certain differences between the recollections of Starodubov and Dobrynin (they differ on whether McNamara broached the subject of limits on offensive weapons), both accounts show that active discussions about the possible format and scope of arms control negotiations took place in early 1966.

The US proposal to emphasize missile defense as the main topic for discussion was informed by McNamara's concept of the relationship between offensive and defensive weapons: he posited that in the absence of limits on defense, parties would engage in an unrestricted arms race in offensive arms. This was an arms-control-type approach that emphasized the achievement of strategic stability as a means of reducing the probability of war. Moreover, the apparent attempt to drop offensive weapons from the proposed agenda of future talks probably reflected a US assumption that the Soviet Union would continue to build up its offensive forces at least until it caught up with the United States. Limits on missile defense could, theoretically, help ensure that the Soviet Union would not increase its offensive forces beyond that level. Soviet insistence on the inclusion of offensive weapons was apparently informed by the same goal—equal limits. It is significant, however, that the United States did not offer to reduce its offensive weapons to meet the Soviets at lower limits. Having dropped its initial proposal about a freeze, Washington seemed comfortable with waiting for the Soviet Union building up to its level and then limit both sides' offensive arsenals.

The Soviet leadership concluded the development of its position on arms control talks with the United States only by the end of 1966, when the Politburo approved a memorandum prepared by the Foreign Ministry. That memorandum addressed the issue in very general terms, proposing

[41] Dobrynin, *In Confidence,* p. 144.

cooperation with the United States to prevent nuclear war and end the nuclear arms race even as the two countries remained in competition and conflict over a broad range of other issues.[42] Judging by Dobrynin's account, the Politburo decision was of a general nature and did not address details, which were effectively left for relevant agencies to decide and then submit for approval. This pattern is also consistent with the finding of Dr. Sergey Radchenko cited above that the Politburo rarely addressed arms control and nonproliferation and never in depth. Even a broad decision in principle was important in the sense that it postulated the possibility and the desirability of nuclear arms limitations and potentially reductions with the main geopolitical and ideological rival.

It took the two countries more than a year to reach an agreement on what future negotiations would address. The Johnson-Kosygin meeting at Glassboro in June 1967 is widely regarded as a turning point, but there was little new in that discussion, according to the account of Dobrynin, who was present at both days of negotiations. Johnson proposed to discuss limitations on missile defense while Kosygin declared that defense was "moral" and that the parties should concentrate on reducing offensive weapons instead of defensive or, at a minimum, both offense and defense.[43] It is hard to see the meeting as a turning point except perhaps the fact that these issues were discussed at the highest level and perhaps helped improve understanding of the substance of the discussion more than previously had been possible; in diplomacy, such meetings often help move things forward. In the end, the two parties reached an agreement on the format of future negotiations only in 1968.

Dobrynin mentions that the US and Soviet leaders also discussed nonproliferation, but very briefly and without connection to arms control. Effectively, they agreed in passing that they shared an interest in a nuclear nonproliferation regime but did not link it to arms control.

The history of US and Soviet discussions on what later became the SALT I negotiations demonstrates that the link between nonproliferation and arms control was tenuous; the latter had intrinsic value for both countries

[42] Dobrynin, p. 140.
[43] Dobrynin, pp. 150-151.

and most likely would have been pursued regardless of the outcome of negotiations on a nonproliferation treaty. But progress in NPT negotiations and US-Soviet cooperation in that area facilitated movement toward arms control talks: interaction in the NPT framework demonstrated that cooperation was possible, including on difficult and controversial issues

Agreeing on a common framework took several years—not because it was tied to progress at the NPT negotiations in Geneva, but because the two countries had significant conceptual and practical differences that had to be bridged. The Soviet Union found it difficult to accept McNamara's perspective on missile defense; the United States was not particularly interested in limiting offensive weapons because it still had superiority over the Soviet Union. The resulting package—negotiations on both offensive and defensive weapons—was a reasonable compromise. It helped slow down the arms race—though not end it completely because SALT I and subsequent treaties did not prevent a qualitative arms race. The Soviet transition was particularly difficult on the conceptual side (as reflected in Kosygin's insistence in Glassboro on the morality of defense) and thus took longer than was the case for the United States.

In other words, the path of the two countries toward arms control was subject to its own internal logic, the logic of strategic nuclear balance. The appearance of synchronization between NPT and arms control talks was apparently just that—an appearance. As described above, the Soviet Union made a decision to seek a nonproliferation treaty at the end of 1964, but it made a decision to engage in arms control talks with the United States two years later.

Throughout the history of arms control, the United States and the Soviet Union (Russia after the end of the Cold War) sought to carefully isolate that bilateral process from the influence of states parties to the NPT. The success of these attempts varied over time but with very few and short-lived exceptions (such as the discussion of nuclear disarmament by Mikhail Gorbachev in the late 1980s) disarmament was not on their agendas.

The 1975 NPT Review Conference: The First Test of Compatibility

The approach chosen by the United States and the Soviet Union with respect to the relationship between nonproliferation and disarmament, which succeeded

in ensuring successful completion and entry into force of the NPT, faced the first major test at the 1975 NPT Review Conference. That conference can be regarded as a test because the two superpowers came to it with what they saw as important arms control achievements. In 1972, they had signed SALT I and the ABM Treaty, which limited both a significant part of their strategic offensive arms[44] and the capability of missile defense systems. In 1974, the two countries also agreed on the so-called Vladivostok framework, which outlined the key provisions on the planned follow-on treaty, which, among other features, provided for the inclusion of strategic air-launched delivery vehicles (strategic bombers). Building on the Partial Test Ban Treaty, which allowed only underground testing, the 1974 Threshold Test Ban Treaty limited the yield of nuclear explosions to 150 kilotons. US and Soviet leaders issued a range of joint statements that aimed at preventing nuclear war between their countries. In other words, the United States and the Soviet Union believed they could legitimately claim movement toward implementation of Article VI.

Reflecting this assessment of arms control achievements during the five-year period between the NPT's entry into force and the 1975 Review Conference, the Soviet position paper on the future final document, which was circulated in the run-up to the conference, insisted that "emphasis should be made

[44] SALT I was, indeed, limited in its scope: it established ceilings only on land- and sea-launched strategic weapons but left strategic bombers outside its scope. The two parties failed to agree on the definition of "strategic" as applied to air-launched nuclear weapons. The Soviet Union insisted that all aircraft that can reach the territory of the other side be classified as strategic, which would have resulted in the inclusion of almost all US aircraft on the territories of US allies and partners but excluded similar types of Soviet aircraft. The United States proposed that only aircraft that can reach the territory of the other side *from their own territory* be classified as strategic. Motivated by the desire to conclude the treaty as quickly as possible (in no small measure, to complete the business before the US presidential election), the United States and the Soviet Union agreed to postpone this issue to the follow-on negotiations. The exclusion of one category of strategic weapons out of three—and the one in which the United States held a decisive advantage—resulted in unequal limits written into the text of SALT I: the Soviet Union had more strategic missiles (especially land-based ICBMs) and the text reflected it. If all three elements of the strategic triad had been included, SALT I would have provided for equal limits. The apparent imbalance prompted the adoption of the Jackson Amendment during Senate consideration of SALT I, which demanded equal limits in the next treaty; that amendment was self-implementable because the parties had already agreed that strategic bombers would be included into the next treaty.

on the importance of the Soviet-American agreements on the limitation of strategic arms and underground nuclear weapons tests, on the prevention of nuclear war, and also on the Vladivostok understanding which provides the basis for concluding a new agreement on curbing the strategic arms race."[45] One can easily detect the feeling of satisfaction with the results of US-Soviet negotiations and the expectation that other states would share that positive assessment and consider them a sufficient demonstration of the implementation of Article VI. The Soviet statement at a plenary meeting of the conference delivered by deputy foreign minister Igor Morokhov noted that "while progress on disarmament negotiations cannot as yet evoke satisfaction, significant achievements have nonetheless been made," citing SALT I; the Threshold Ban Treaty; the talks on Mutual and Balanced Force Reductions, which were negotiations, beginning in 1974, on reductions in the conventional forces of NATO and the Warsaw Pact; and the Biological Weapons Convention, which was opened for signature in 1972.[46]

The 1975 Review Conference also saw the first instance of close coordination among nuclear-weapon states with respect to their Article VI implementation record or, to put it differently, coordination vis-à-vis non-nuclear-weapon states. The Soviet Union proposed consultations among three depositaries of the NPT—the United States, the United Kingdom, and the Soviet Union—to coordinate their positions and develop a common approach to NPT issues prior to the review conference.[47] That initiative probably reflected not only the Soviet understanding of the shared interest of nuclear-weapon states in maintaining a united front vis-à-vis non-nuclear-weapon states, but also the well-documented Soviet attempts to build a special relationship with the United States, which presumed achievement of consensus before the two

45 "Soviets distribute position paper on NPT," cable from the US Embassy in Moscow, Moscow 4567, April 3, 1975, National Archives and Records Administration (NARA), https://aad.archives.gov/aad/createpdf?rid=16824&dt=2476&dl=1345.

46 "NPT RevCon: Plenary general debate," cable from the US Mission in Geneva, May 6, 1975, Geneva 03288, May 7, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=235669&dt=2476&dl=1345.

47 "Tripartite Consultations on NPT Review Conference," cable from Secretary of State Henry Kissinger to US Missions in Moscow, Vienna, Geneva, London, and New York, State 050421, March 6, 1975, https://aad.archives.gov/aad/createpdf?rid=203349&dt=2476&dl=1345.

capitals went public with their policies or talked to other states.[48] In the specific case of the NPT and Article VI deliberations, Moscow probably chose to work in the trilateral format because it was difficult to avoid the third depositary of the NPT.

Trilateral consultations were successful in the sense that participants were able to agree on a joint draft of the review conference's final document.[49] On the other hand, the depositary states did not include any language related to Article VI in their draft. It looked like they did not think this issue would present a serious challenge. They could not have made a bigger mistake. During the review conference, the US delegation had to admit that "launching of the tripartite draft declaration ran into difficulties" and that the delegation expected "to be given hard time, even for [sic] friendly delegations, especially on Article VI, nuclear test ban and negative security assurances."[50]

Speaking at the same session of the review conference as Morokhov, Alfonso García Robles, the head of Mexican delegation, declared that the implementation of Article VI by the United States and the Soviet Union was "very meager" and that Mexico intended to introduce two new protocols for inclusion into the NPT, one of them calling for fast and deep reductions in the number of nuclear weapons. Clearly seeking to leverage the superpowers' interest in nonproliferation, he declared that success of the NPT was "in the hands of nuclear weapon states and no one else."[51]

With support of a group of like-minded states, Mexico tabled three draft protocols "with a view to establishing procedures which, in the opinion of

48 See Nikolai Sokov, "IAEA Safeguards: Patterns of Interaction and Their Applicability Beyond the Cold War," in William C. Potter and Sarah Bidgood, eds., *Once and Future Partners: The United States, Russia, and Nuclear Non-proliferation* (London: International Institute for Strategic Studies, 2018).

49 "NPT RevCon: Draft Final Declaration," cable from the US Mission in London about a draft declaration by the United States, United Kingdom, and Soviet Union, agreed ad referendum, London 06145, April 23, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=14865&dt=2476&dl=1345; "NPT RevCon: Draft final declaration," cable from the US delegation to the NPT Review Conference in Geneva, Geneva 03196, May 5, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=234008&dt=2476&dl=1345.

50 "NPT RevCon: Analysis of first week," cable from the US mission in Geneva, Geneva 03427, May 12, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=236194&dt=2476&dl=1345.

51 "NPT RevCon: Plenary general debate."

its co-sponsors, would facilitate the achievement at an early date of some important measures of nuclear disarmament."[52] The first document proposed immediate cessation of nuclear testing by three NPT depository states. The second draft protocol envisioned, among other things, a requirement that the United States and Russia reduced their strategic delivery vehicles by 50 percent from the level of 2,400, which was discussed as part of the Vladivostok framework for SALT II, including a 50 percent reduction in the number of missiles carrying multiple independently targetable reentry vehicles (MIRVs); subsequently, the parties were supposed to reduce their nuclear forces by 10 percent each time 10 additional states joined the NPT. The third proposal pertained to negative security assurances—namely, that nuclear-weapon states would not threaten the use of nuclear weapons or use them against non-nuclear-weapon states.

The proposal for a radical acceleration of nuclear reductions, which was to a greater or lesser extent supported by a broad range of other countries, came as a shock to the nuclear-weapon states. Communications between the US delegation in Geneva, where the review conference took place, and Washington display a near-panic state of mind. The US delegation reported to Washington with great alarm that discussions in Main Committee I of the conference were unfavorable to nuclear-weapon states and that "virtually all non-aligned delegations and significant number of [countries from the Group of Western European and Other States] have minimized SALT achievements, criticized rate of progress, and called for rapid reductions in Vladivostok levels. Many have said follow-on agreements should involve qualitative curbs as well as reductions in numerical ceilings."[53] US diplomats also noted that "while sympathy [was] not great for mechanistic Mexican approach to

52 Working Paper Containing a Draft Additional Protocol to the Treaty on the Non-Proliferation of Nuclear Weapons Regarding the Implementation of Its Article VI, NPT/CONF/35/1, Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, Geneva, 1975, Annex II, p. 6, https://undocs.org/pdf?symbol=en/NPT/CONF/35/I.

53 "NPT RevCon: Committee I situation," cable from US Secretary of State Henry Kissinger quoting a cable from the US Mission in Geneva, State 117308, May 20, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=237100&dt=2476&dl=1345; "NPT RevCon: Request for Guidance on Test Ban (Article VI)," cable from the US Mission in Geneva, Geneva 03858, May 25, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=233857&dt=2476&dl=1345.

reductions schedule, several delegations still want some sort of timetable. Swedish view—rejecting 'artificial' timetable but calling on superpowers to provide 'realistic' one—is perhaps typical."[54]

Soviet representatives vehemently and openly opposed the Mexican proposals. A May 20 cable from the US delegation in Geneva gave the following description of the Soviet response delivered by Viktor Israelyan: "In bare-knuckle statement on last day of Committee I discussion, USSR (Israelyan) rejected Mexican Protocols (Geneva 3408) as 'quite obviously unacceptable.' He said Soviets refused to negotiate on the basis of these documents and declared that no procedural or organizational conference decisions could impose unacceptable documents."[55] The harshness of the response focused attention on the Soviet Union and the US delegation. The May 20 cable noted with satisfaction that "Soviet position has for time being kept heat off US," but also indicated that it was impossible to avoid responding to the criticism by non-nuclear-weapon states and ignore their demands. When an attempt to "sell" arms control achievements to non-nuclear-weapon states failed, it was necessary to find a compromise. The Soviets shared that opinion. After delivering an angry response to the Mexican proposals, Israelyan felt it appropriate to nod to Eastern and Western European delegations whose proposals, he said, "were constructive since they could provide basis for compromise, leading to consensus."[56]

Reporting on the meeting of several states parties convened by the Inga Thorsson of Sweden, the president of the review conference, to complete work on the final document, the US delegation admitted that it failed to fully deflect the pressure and had to agree to a compromise language.[57] The Soviet delegation concurred.

The Final Document of the 1975 NPT Review Conference welcomed "the various agreements on arms limitation and disarmament elaborated and

54 "NPT RevCon: Committee I situation."
55 "NPT RevCon: Soviet statement, Committee I, May 23," cable from the US Mission in Geneva, Geneva 3845, May 24, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=237570&dt=2476&dl=1345.
56 "NPT RevCon: Soviet statement, Committee I, May 23."
57 "NPT RevCon: Final Declaration," State 126005, May 30, 1975, NARA, https://aad.archives.gov/aad/createpdf?rid=234330&dt=2476&dl=1345.

concluded over the last few years as steps contributing to the implementation of Article VI of the Treaty" but expressed "serious concern that the arms race, in particular the nuclear arms race, [was] continuing unabated." The document urged complete cessation of all nuclear tests and committed states parties (in effect, the United States and the Soviet Union) to "commencement of follow-on negotiations on further limitations of, and significant reductions in, their nuclear weapons systems as soon as possible."[58]

The outcome of the review conference represented a mixed bag for the United States and the Soviet Union. On the one hand, they successfully deflected pressure to commit to fast-track elimination of nuclear weapons and therefore could continue to pursue arms control in the manner and the scope they considered feasible and desirable. Indeed, even limited achievements were a welcome change compared to the unrestricted arms race and balancing on the verge of war: the Cuban Missile Crisis was still fresh in the minds of many policy makers. On the other hand, they realized that efforts to stabilize the strategic balance could not be easily "sold" to non-nuclear-weapon states as progress toward nuclear disarmament. They saw that they would continue to experience pressure from some non-nuclear-weapon states and would need to work closely with the more moderate of those states in search of compromise language. Paradoxically, this defensive posture with respect to the NPT and its review process probably helped solidify US-Soviet cooperation within the framework of that regime.

Arms Control and Article VI at the End of the Cold War and After

The 1975 NPT Review Conference served as a model for interaction between nuclear-weapon and non-nuclear-weapon states with respect to Article VI in subsequent decades. Arms control continued in fits and starts, driven by its own logic and domestic politics in both countries, which determined the feasibility of negotiations (determined by the evolution of the strategic balance) and the political will of changing governments to pursue them. The high point of the signing of SALT II in 1979 was replaced with a low when President Jimmy Carter withdrew it from Senate consideration in early

58 Review Conference of the Parties to the Treaty on the Non-proliferation of Nuclear Weapons, Final Document, NPT/CONF/35/1, Geneva, 1975, Annex I, https://undocs.org/pdf?symbol=en/NPT/CONF/35/I.

1980. Then the Euromissile crisis began and highly conflictual negotiations on intermediate-range and strategic weapons in 1981-83 ended with the Soviet withdrawal from the talks. The deep crisis was replaced with a string of successful negotiations in the second half of 1980s when Gorbachev radically changed the Soviet approach to arms control, along with other elements of Soviet foreign and domestic policies. The Soviet leader opened the way for several major arms control treaties, which defined the arms control landscape for decades to come—the 1991 Strategic Arms Reduction Treaty (START I); the 1987 Intermediate-Range Nuclear Forces (INF) Treaty, which banned land-based intermediate-range missiles; and the nonbinding 1991-92 Presidential Nuclear Initiatives (PNIs) for nonstrategic weapons (in reality, for everything that was not covered by the previous two treaties).

These ups and downs continued without direct relationship to the NPT review process for the simple reason that the goals of Article VI and of US-Soviet arms control remained fundamentally different even though they could overlap when it came to more immediate, short-term measures.

The difference between nuclear disarmament and arms control is well illustrated by the treaties concluded at the end of the Cold War. Since their goal—in line with the arms control purposes of these agreements—was prevention of a disarming first strike, they concentrated on deliverable nuclear weapons—that is, those that were deployed on delivery vehicles such as missiles or bombers and could be used on short notice. The rest of the stockpiles remained outside the scope of these treaties. The only exception to that rule was the PNIs, which provided for reduction of nuclear weapons themselves, but that regime did not include any transparency and verification measures.

Moreover, during the course of negotiations, the parties had to achieve compromises, which sometimes made these treaties less effective. START I's accounting rules, for example, allowed the parties to exceed the agreed limit of deployed warheads (6,000) by several hundred without formally violating it. A constant feature of all arms control efforts was low effectiveness of treaties in preventing a qualitative arms race. As a rule, negotiations began to address innovations only when both parties obtained new weapon systems; if only one party had a certain new class of weapons it usually tried to shield it from treaties, with rare exceptions. Moreover, the two countries tended

to avoid negotiations or drag them out during the periods during which they were engaged in development and deployment of a new generation of weapons. Since the waves of replacement did not coincide, it was always difficult to achieve a tangible result at the negotiating table.

During the Cold War, arms control negotiations were by and large isolated from the rest of the bilateral and multilateral agenda. They tended to continue even during times of deep political crises, although the propensity to seek compromises varied because it depended heavily on domestic politics. International opinion was perhaps the least tangible variable affecting the success or failure of bilateral negotiations.

Not surprisingly, non-nuclear-weapon states were not happy with that situation, and the claims by the United States and the Soviet Union that they were moving step by step to implement their obligations under Article VI were continuously questioned. Yet, the non-nuclear-weapon states lacked sufficient leverage to change the situation and US allies, moreover, depended on the US "nuclear umbrella." The Cold War period and, in particular, the deep crisis in arms control in the first half of the 1980s confirmed once again that while the impact of nuclear weapons is global, decisions about them are made nationally, with only limited influence of other states. The Final Document of the 1985 NPT Review Conference, which took place during perhaps the deepest crisis since US-Soviet talks began in 1969, could only remind the superpowers about their obligations under Article VI and their promise that "ultimately the bilateral negotiations, just as efforts in general to limit and reduce arms, should lead to the complete elimination of nuclear arms everywhere." The document also expressed regret that SALT II did not enter into force (but also noted that the parties promised to abide by it) and that negotiations in 1981-83 ended inconclusively. Against this background, the document expressed hope that new negotiations that had been launched by the United States and the Soviet Union months before the review conference would result in an agreement.[59]

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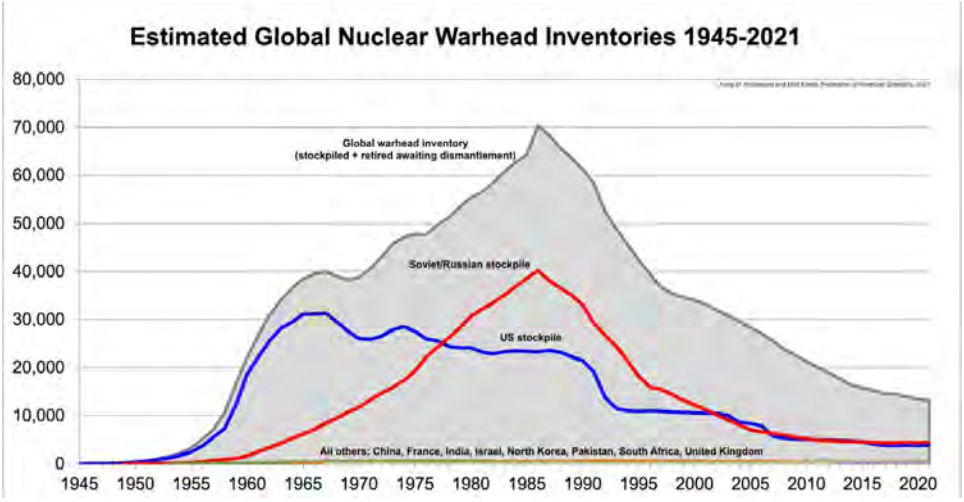
[59] Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, NPT/CONF.III/64/1, Part I, Geneva, 1985, https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/pdf/finaldocs/1985%20-%20Geneva%20-%20NPT%20Review%20Conference%20-%20Final%20Document%20Part%20I.pdf.

Things began to change after the end of the Cold War but in ways that would have been difficult to predict. One might have expected that in the absence of a socioeconomic, political, and geopolitical confrontation, the two countries would accelerate reduction of nuclear weapons. The prospects for nuclear disarmament looked more realistic—albeit still remote—for the first time since the beginning of the nuclear era. Instead, the two leading nuclear-weapon states seemed to have lost interest in arms control and, at the very least, the sense of urgency to engage in it. Each side's efforts to modernize its military programs, including its nuclear forces, came to be pursued unilaterally and without regard to how the other side viewed them. Worse, the military balance became significantly more complex. Whereas during the Cold War, the arms control process could fully concentrate on nuclear weapons, the post-Cold War period saw the "entanglement" of nuclear and conventional weapons,[60] which is bound to make future negotiations even more difficult and less likely to succeed.

To be fair, reduction of nuclear weapons has not only continued but even accelerated. Today US and Russian stockpiles represent only a relatively small share of their Cold War highs. The dynamic of nuclear stockpiles, illustrated in Figure 1, shows quite dramatic positive changes.

[60] James Acton, "Why Is Nuclear Entanglement So Dangerous?" Carnegie Endowment for International Peace, January 23, 2019 https://carnegieendowment.org/2019/01/23/why-is-nuclear-entanglement-so-dangerous-pub-78136.

Figure 1: Estimated Global Nuclear Warhead Inventories 1945-2021



Source: Federation of American Scientists

On the other hand, this figure demonstrates that reductions have slowed down almost to a standstill in the last five years or so. Moreover, the bulk of these reductions have been implemented outside the framework of treaties and were not subject to transparency and verification measures. One would be justified in saying that these reductions represented optimization of nuclear arsenals and reflected the desire of both countries to get rid of nuclear weapons they no longer needed. Seen from that perspective, it is not surprising that reductions have stopped: the United States and Russia have removed all their unnecessary nuclear weapons and have achieved the core nuclear capability that they will be much more reluctant to part with. Further reductions are not impossible— in 2013, the Obama administration proposed to reduce the number of deployed strategic warheads by one-third from the present levels—but the parties have apparently reached the bottom of unilateral reductions and have failed to even begin negotiations on coordinated reduction of nuclear weapons. In any event, there is scarce evidence that complete elimination of nuclear weapons in the foreseeable future is seriously entertained by either party.

While any nuclear reductions are a positive development, whether within or outside the framework of international agreements, it is also worth pointing out that unilateral reductions do not involve transparency and verification mechanisms. Nuclear stockpiles remain as opaque as at any time during the Cold War. The Obama administration's decision to begin publishing the overall number of US nuclear weapons was, unfortunately, short-lived, and the practice was discontinued under the next administration.

Throughout the post-Cold War period, the two parties have also demonstrated a remarkable inability to conclude new treaties. To be sure, negotiations during the Cold War were protracted and difficult, but they ultimately resulted in treaties. Not so after its end. The record is quite abysmal:

- The first post-Cold War treaty, the 1993 START II, languished for almost 10 years without entering into force. It was approved by the US Senate, but the Russian parliament refused to ratify it until 2000, and then only with conditions that were unacceptable to US Senate. In 2002, Russia declared START II null and void following US withdrawal from the 1972 ABM Treaty.
- In 1997, the United States and Russia agreed on a framework for START III, but consultations never truly got started. The last meeting was in the fall of 2000, and the process did not resume after the administration in the United States changed.
- The 2002 Strategic Offensive Reductions Treaty (SORT) was little more than a joint statement about the intention to reduce the number of deployed strategic weapons. It lacked enforcement, transparency, and verification mechanisms and could only function while START I continued to remain in force.

In 2010, after the expiration of START I, the United States and Russia succeeded in negotiating a new treaty, New START, which was needed to restore the transparency and verification regime and also ensure strategic stability as the parties negotiated a follow-on treaty. As of today, New START remains the only functioning nuclear arms control treaty.

The post-Cold War period also saw the collapse of several key treaties. In 2002, the United States withdrew from the ABM Treaty, which was widely considered the cornerstone of strategic arms control. In 2019, the

United States withdrew from the INF Treaty following years of inconclusive arguments with Russia over perceived violation of INF by the latter. In both cases, the parties failed to seriously consider replacing the old treaty with a new one or making adjustments to it. In the case of the INF Treaty, they even failed to fully utilize the mechanism provided by that treaty to resolve suspicions and concerns.

Another indicator of the sorry state of affairs is the comparison of the time the two countries have spent without negotiations since 1969 when talks first began:

- Fall of 1979 to fall of 1981 (from the signing of SALT II to the beginning of INF-START talks);
- End of 1983 to early 1985 (from the Soviet decision to "discontinue" START I and INF negotiations to the beginning of new talks);
- 1993-1997 (from the signing of START II to consultations on START III);
- 2002-2009 (from the signing of SORT to the beginning of New START negotiations);
- Since 2010 (from the signing of New START to the present).

During the Cold War, negotiations were often deadlocked, but both parties tended to continue them even when the chances of reaching an agreement seemed slim. The absence of negotiations was widely perceived as unacceptable by the international community and domestically; in 1981, the Reagan administration had to begin negotiations with the Soviet Union under pressure both from inside the United States and from the international community (including first and foremost Europe) even though it was reluctant to do so.[61] Even deadlocked negotiations have their benefits: they allow better understanding of the perspective of the other party and keep the channel open so that when conditions become more favorable, the parties find it easier to make progress. After the end of the Cold War, negotiations have become an exception rather than a rule.

It is also notable that the breakdown of arms control talks in 1979-81 and 1983-85 was widely regarded as a major crisis; there was strong domestic and international pressure on the two governments to resume negotiations. The decade-long—and continuing—absence of negotiations since the signing

[61] For detailed account see Strobe Talbott, *Deadly Gambits* (New York: Vintage Books, 1985).

of New START does not seem to generate anywhere near the same level of concern, either domestically or internationally.

It appears that both the United States and Russia do not accord arms control, including nuclear arms reductions, the same priority as they did during the Cold War. There is no lack of public statements, of course, but less readiness to invest political capital to reach compromises, which are inevitable in the course of negotiations, as well as subsequent ratification.

In hindsight, it is clear that the extent to which the United States and Russia were prepared to implement Article VI of the NPT was determined primarily by the views of the two governments on the desirability and the feasibility of deep reductions of nuclear weapons and the role nuclear weapons played in their security policies. The views of the US government played a particularly strong role in this regard, given the unparalleled influence of the United States in the international system. There were high points in that process: the 2000 and the 2010 NPT Review Conferences each adopted a broad and far-reaching agenda on nuclear reductions. The full implementation of these agendas could lead both sides to a situation where only one or two steps would separate them from elimination of nuclear weapons.

The 2000 Review Conference came on the heels of the 1995 conference, which extended the NPT indefinitely. With respect to Article VI, the 1995 conference adopted the "principles and objectives," which were comparatively modest in their language dealing with US-Russian nuclear arms reductions. The two states were encouraged to pursue "systematic and progressive efforts to reduce nuclear weapons globally, with the ultimate goal of eliminating those weapons."[62] This general language is understandable given both the progress in nuclear arms reductions that had recently been achieved (START I and II, as well as a broad range of other initiatives).

The 2000 Review Conference more than compensated for the relative modesty of the 1995 document by adopting 13 "practical steps" for the implementation of the 1995 principles and objectives. The list of these steps was quite impressive: they covered essentially the entire range of issues needed

62 Decision 2: Principles and Objectives for Nuclear Non-Proliferation and Disarmament, NPT/CONF.1995/32 (Part I), Annex, 1995, https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/1995-NPT/pdf/NPT_CONF199501.pdf.

to implement nuclear disarmament, including—in a departure from the previous pattern—specific recommendations to be addressed in the bilateral US-Russian negotiations.[63] Perhaps the reason for the adoption of the broad and detailed agenda was dissatisfaction with relatively modest progress judged against expectations.

Negotiations on that agenda were difficult, however. According to an article in 2000 by Tariq Rauf, who later was head of the Verification and Security Policy Coordination Office at the IAEA, "the major contention became the nuclear-weapon states' refusal to accept operational measures to reduce nuclear weapons and increase transparency and accountability unless there were escape clauses referring to strategic stability and undiminished security. These became buzz words for the perceived right of the [nuclear-weapon states] to retain nuclear weapons indefinitely and to undertake nuclear arms reductions at a level, pace, and context determined solely by them."[64] References to "strategic stability and undiminished security" could—and did—provide a justification for not implementing the "13 practical steps" by referencing other elements of the military balance. Russia used this formula particularly often by referencing the refusal of the United States to limit missile defense and its preponderance in precision-guided conventional weapons.

While the key role in the adoption of the language on the "practical steps" belonged, without doubt, to non-nuclear-weapon states and especially the New Agenda Coalition,[65] these negotiations also displayed, for the first time, differences between the US and the Russian attitudes toward Article VI. The United States, under the Clinton administration, was far more positive toward adoption of a far-reaching program of action than Russia, which resisted obligations to make deep reductions in its nuclear weapons

63 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, NPT/CONF.2000/28, Vol. I (Parts I and II), 2000, https://unoda-web.s3-accelerate.amazonaws.com/wp-content/uploads/assets/WMD/Nuclear/pdf/finaldocs/2000%20-%20NY%20-%20NPT%20Review%20Conference%20-%20Final%20Document%20Parts%20I%20and%20II.pdf.

64 Tariq Rauf, "An Unequivocal Success? Implications of the NPT Review Conference," *Arms Control Today,* July-August 2000, https://www.researchgate.net/publication/265288317.

65 The New Agenda Coalition is a group of middle-power states formed in 1998 to facilitate progress on nuclear disarmament. It consists of Brazil, Egypt, Ireland, Mexico, New Zealand, and South Africa.

as much as it could (and used the excuse of "strategic stability" more than other nuclear-weapon states). Simply put, the United States sought to avoid ironclad obligations that could lead to nuclear disarmament while Russia tried to avoid any obligations at all. Russia also took the lead among nuclear-weapon states in opposing or at least seeking to modify proposals of non-nuclear-weapon states on "practical steps," putting itself into the rather unenviable position of being the main opponent of nuclear disarmament.

This difference between the US and the Russian approaches stemmed from the differences in their perception of the role of nuclear weapons in security policy. The United States under the Clinton administration consistently reduced reliance on nuclear weapons, opening the way to deep reductions. This process, however, was pursued not through elimination of nuclear missions inherited from the Cold War but rather through the transfer of many of these missions to advanced long-range precision-guided conventional weapons. The United States held unquestionable superiority, perhaps even bordering on monopoly, in this area. Russia, in response to that development, began to increase reliance on nuclear weapons as witnessed by the 2000 Military Doctrine,[66] which was adopted shortly before the review conference of that year. That doctrine expanded the role of nuclear weapons to allow their use in less-than-global conflicts and effectively assigned them the role of deterring a conventional conflict with the United States and its allies. This put Moscow on the defensive with respect to Article VI not only vis-à-vis non-nuclear-weapon states, as had been the case in all previous review conferences, but also vis-à-vis the United States, which had not happened before. Even the joint statement of the P5 (the five countries that the NPT recognizes as nuclear-weapon states—China, France, Russia, the United Kingdom, and the United States)[67] could not completely paper over that difference.

66 Nikolai Sokov, "Russia's Nuclear Doctrine," Nuclear Threat Initiative, August 1, 2004, https://www.nti.org/analysis/articles/russias-nuclear-doctrine/.

67 "Statement by the delegations of France, the People's Republic of China, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America," NPT/Conf.2000/21, 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. Final Document, Vol. II, Part III, Documents issued at the Conference (New York, 2000), pp. 359-362. The five nuclear-weapon states recognized by the NPT are often known as P5 because they are also permanent members of the UN Security Council.

The change of the administration in the United States in 2001 undermined the implementation of the 2000 Review Conference's Final Document. President George W. Bush and his team were not predisposed to entertain steps that could result in nuclear disarmament, much less legally binding treaties (even though the Bush administration implemented record unilateral reductions in the US nuclear stockpile). As noted above, the treaty it concluded with Russia, SORT, was little more than a joint statement about intentions that received the name of the treaty in a concession to Russian wishes.[68] Given the views of the US administration and the enhanced role of nuclear weapons in Russia's security policy, it is no wonder that the 2000 Review Conference agenda was never implemented.

The next high point in the NPT review process was in 2010 on President Barack Obama's watch. The review conference's "action plan" on nuclear disarmament was even more ambitious in many respects than the one in 2000. It is sufficient to point out that the "action plan" supported, for the first time, a proposal on negotiating a convention banning nuclear weapons. The 64-point plan contained many specific, practical planks that were designed to move the nuclear disarmament process forward at a rather fast pace. As in 2000, there were two dividing lines: one between nuclear "haves" and nuclear "have-nots" and the other between the United States and Russia. Although Washington resisted any language that could be interpreted as an obligation for "time-bound" elimination of nuclear weapons, its position at the review conference was nonetheless informed by Obama's speech in Prague in 2009, which offered a vision of a nuclear-weapon-free world—a vision that was in essential agreement with the vision of non-nuclear-weapon states except that instead of "time-bound" elimination of nuclear weapons, he said that "this goal will not be reached quickly –- perhaps not in my lifetime."[69] Washington's decision to disclose the size of its nuclear stockpile

[68] During his first summit meeting with Vladimir Putin, George W. Bush expressed a preference for reductions under the PNI formula used by his father—that is, two unilateral statements about intentions to reduce strategic weapons. Putin insisted on a legally binding treaty, however. The outcome was a short text that was more appropriate for a joint statement but was called a treaty.

[69] White House, Office of the Press Secretary, "Remarks by President Barack Obama in Prague as Delivered," April 5, 2009, https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-prague-delivered.

during the conference represented a major step forward in transparency of nuclear arsenals.

The central conflict between the United States and Russia developed over the issue of nonstrategic nuclear weapons. As described in an analysis by the James Martin Center for Nonproliferation Studies,

> Russia, which has said it will not enter into negotiations covering such weapons before U.S. weapons are withdrawn to the national territory of the United States, was adamant that no language appeared at any time in any conference document referencing NSNW [nonstrategic nuclear weapons] and made various threats in this regard. […] In what appears to have been a rather public message to Russia, the U.S. spokesperson on disarmament Ambassador Laura Kennedy also said on the conference floor that her country was looking forward to addressing *all* types of weapons *regardless of their location* in future arms control negotiations. The final document accepted this formulation and sidestepped the issue of NSNW and nuclear sharing by committing NWS [nuclear-weapon states] to "reduce and ultimately eliminate *all* types of nuclear weapons, deployed and non-deployed." (italics added) Moreover, Action 5 in the final draft commits NWS to "address the question of all nuclear weapons regardless of their type or their location…," albeit "in a way that promotes international stability, peace and undiminished and increased security"—the preferred Russian caveat.[70]

The disagreement obviously transcended the specific issue of nonstrategic nuclear weapons. As often happens in international negotiations, one issue may become emblematic of broader disagreements and emerge as a focus of a broader conflict. Nonstrategic nuclear weapons were not so central to Russia's security and arms control policy as to warrant an intense conflict with all key players of the NPT Review Conference; that issue had to be judged against a broader vision of arms control, which began to emerge in 2000 and was officially and explicitly formulated by Foreign Minister Sergey Lavrov

70 William Potter, Patricia Lewis, Gaukhar Mukhatzhanova, and Miles Pomper, "The 2010 NPT Review Conference: Deconstructing Consensus," CNS Special Report, June 17, 2010, https://www.nonproliferation.org/wp-content/uploads/2016/07/100617_npt_2010_summary.pdf. (The italicization is in the original CNS document.)

during the hearings in the Russian parliament on New START ratification.[71] Lavrov postulated an "integrative approach" to arms control. Under this approach, nuclear weapons are just one element of a broader military balance and therefore are not to be addressed separately from other issues. (Lavrov specifically listed missile defense, long-range conventional weapons, and space weapons.) Consequently, Russian references to "strategic stability" and "undiminished security" reflected the determination to avoid making nuclear weapons the exclusive, or even primary, focus of arms control. Deep reductions in nuclear weapons, according to the Russian view, could happen only as part of a broader package that addressed specific Russian security concerns.

The fundamental conflict between the US propensity (at least under the Obama administration) to accord primary attention to nuclear weapons and the Russian insistence on the integrative approach subsequently emerged as the main reason for the failure to launch negotiations on a follow-on to New START until the end of Obama's term in 2017.

The failure to achieve further reduction of nuclear weapons after 2010 and, in a broader sense, the less-than-stellar achievements in that area over the last two decades bring to the fore the difference between nuclear disarmament and arms control. The Russian approach especially was informed by the latter—it emphasized strengthening of international and national security as well as the strategic balance. Nuclear weapons in this context were regarded as an essential element of security policy and were not to be removed until the country's security in a nonnuclear world could be guaranteed. Given the overall worsening of the relations between Russia and the West—the United States and its allies first and foremost—as well as the special deterrence value of nuclear weapons, Russia has been very skeptical, to say the least, about additional reductions.

The situation began to change in the late 2010s as Russia achieved a conventional warfighting capability. In 2014, Russia adopted a new Military Doctrine, which provided for conventional deterrence; in 2015, it demonstrated new conventional weapons in Syria. This new development could potentially reduce Russia's reliance on nuclear weapons and make it

[71] Gosudarstvennaya Duma, *Stenogramma Zasedanii* [The State Duma, The Minutes of the Sessions], Vol. 38 (206), 2011, Spring Session, January 11-28, 2011 (State Duma, 2013).

more amenable to their reduction, but the impact is still unclear. It is possible that after Russia has transferred some military missions from nuclear to conventional weapons, the United States and its allies may decide to attach greater relevance to their nuclear weapons.

In early 2021, both the new US administration headed by Joe Biden and the Russian government (still) led by Vladimir Putin extended New START literally days before its expiration and announced their intention to isolate arms control from the rest of the bilateral agenda. It remains to be seen whether the two governments succeed in doing that and engage in productive arms control negotiations in the middle of an all-encompassing political conflict and a relationship dominated by implacable hostility.

The post-Cold War developments with respect to Article VI of the NPT and the bilateral arms control agenda have demonstrated significant departures from the pattern that came to be taken for granted during the Cold War. The United States and Russia have continued to present a common front vis-à-vis non-nuclear-weapon states in seeking to avoid binding obligations to eliminate their nuclear weapons. They have continued to insist that all decisions on nuclear posture, modernization, and possible reductions must be made nationally, without outside influences. Beyond that foundation, the US-Russian relationship with respect to Article VI-related issues has become more strained. In contrast to the Cold War, Russia is no longer the peer of the United States in terms of military—including nuclear—capability, has relied on nuclear weapons more, and has consistently taken a harder line against the pressure of non-nuclear-weapon states in favor of disarmament. This always put it on the defensive when Washington advocated deep reductions, whether in strategic or nonstrategic weapons because such reductions could, from the Russian point of view, undermine its security. During the Clinton years, these differences were mitigated by the overall positive atmosphere in the US-Russian relationship and the assistance the United States provided to Russia as the latter's nuclear forces and nuclear weapon enterprise moved out of the Soviet past, a transition that included such practical issues as transportation of nuclear warheads, security of facilities, and elimination of missiles. Under Obama, US proposals for nuclear arms reductions were treated as unacceptable; by that time, the Soviet Union categorically

insisted on the inclusion of both long-range conventional weapons and missile defense, whereas the United States concentrated on reduction of nuclear weapons.

The relationship somewhat changed under Donald Trump, whose opposition to arms control in general eased pressure on Russia with respect to nuclear reductions and eventual disarmament. Moscow remained highly critical of what it saw as purposeful dismantlement of the existing system of arms control regimes. But at the same time, the situation was not unfamiliar. This was the same type of conflict that happened many times before (for example, under Richard Nixon and Ronald Reagan), so it was easier to handle. It is perhaps not surprising that when, in the summer of 2020, the United States and Russia resumed strategic stability consultations, these at first progressed rather well. In contrast, proposals for more radical reductions under Carter[72] and Obama administrations irritated Moscow and significantly complicated the dialogue.

Paradoxically, strategic stability consultations that were launched in the summer of 2020 appeared more serious than anything that had happened in the US-Russian arms control dialogue since the entry into force of New START in 2011. For the first time in almost a decade, these consultations lasted more than a day or two. It was decided to create several working groups for in-depth discussion of various elements of strategic balance, with an eye to a possible deal; these groups continued to work even after the high-level meeting ended. Those arrangements alone hinted that a serious dialogue was possible after a long break, although that dialogue was, of course, bound to be difficult and time-consuming.

Unfortunately, it was already 2020 and negotiations in a US presidential election year have never been successful. There is little doubt that the unexpected decision of the Trump administration to begin an arms control dialogue with Russia was caused at least in part by election politics. This became even more pronounced in the fall of 2020 when Washington sought a

72 In March 1977, the newly elected Carter administration proposed to revise the 1974 Vladivostok framework for the SALT II treaty and offered what it saw as a more advanced proposal. That attempt caused serious irritation and even anger in Moscow—not so much because the offer was necessarily disadvantageous for the Soviet Union but because it returned negotiations to first base. For details, see Strobe Talbott, *Endgame* (New York: Harper & Row, 1979).

quick deal to be concluded before Election Day—a limited (one year instead of the full five) extension of New START coupled with a verifiable freeze on the size of nuclear stockpiles (the number of nuclear warheads in the arsenals of the two countries). Moscow conceded some points—it agreed to extend New START by only one year and was prepared to undertake a political obligation not to increase the nuclear stockpile without verification—but the US-proposed permanent inspection at nuclear weapon production facilities was too much for it and the dialogue collapsed.

Typically, after the dust of election politics settles, arms control dialogue resumes. (There has been perhaps only one exception to that rule, the first months of the Reagan administration.) It is possible the process launched in the summer of 2020 could have resumed had Trump been reelected. The Biden administration began with the extension of New START for the full five-year term and, in the first months of 2021, gave clear signals it was prepared to enter a serious dialogue. It remains to be seen whether the United States and Russia will be able to leave behind the arms control impasse of Obama years, but new, serious negotiations do not appear impossible.

Cautious optimism notwithstanding, the future of US-Russian arms control remains uncertain. Whether Moscow and Washington can fashion a new agreement in a progressively worsening international environment and a time of growing domestic tensions remains to be seen. Much will depend on whether they can indeed isolate arms control from the rest of the relationship.

The other uncertainty relates to the scope of the future agreement—namely, whether it will be a broad package that goes beyond nuclear weapons or whether Russia makes the same concession as during New START negotiations, agreeing to limit the future treaty to nuclear weapons. Early signs seem to suggest the United States is not inclined to leave Russian advances in long-range conventional weapons and missile defense without attention, so a broad package seems more likely. This will present a new set of challenges: fitting all these issues into one agreement (or a package of separate but interrelated agreements) will not be easy, and there are few precedents to build upon.

Further, the two countries have come to a stage where they may need to radically change the way they address nuclear arms. All previous treaties

addressed the number of deployed weapons (first-strike capability) and the main unit of accounting and verification was delivery vehicles (launchers and missiles). The next agreement may shift the emphasis to nuclear weapons themselves, the nuclear stockpile. Such a move entails a whole new system of accounting and verification in an area that until now has been almost completely outside the purview of arms control. (There were some limited exceptions in the late 1990s and early 2000s in the form of visits to nuclear weapon storage sites when the United States was assisting Russia in enhancing the security of these facilities.) The United States appears ready for that new stage, but Russia has been traditionally opposed to it. Its agreement to discuss a freeze on nuclear stockpiles (even without verification) may indicate that dialogue is possible, but it will definitely not be easy.

If the two countries succeed in the new arms control endeavor, then perhaps the old pattern of US-Soviet/Russian cooperation with respect to Article VI of the NPT can be restored in both senses of that word. As before, they will pursue arms control negotiations and at the same time jointly fend off pressure from non-nuclear-weapon states for faster progress toward complete elimination of nuclear weapons. The entry into force of the Treaty on the Prohibition of Nuclear Weapons in early 2021 will increase that pressure and perhaps force the United States and Russia to work together more closely than they have for the last 10 to 20 years. If, on top of that, they succeed in shifting the focus of arms control efforts from delivery vehicles to nuclear stockpiles, that would be a major positive development in the context of Article VI because a focus on stockpiles (that is, all nuclear weapons, including their production and dismantlement) is a critical precondition for nuclear disarmament.

The prerequisites for starting arms control negotiations and even more for their success are enormous, however. Any failure on this path would result in greater conflict between nuclear "haves" and "have-nots" in the NPT review process, as well as Russia and the United States blaming each other for lack of progress on Article VI. In other words, failure to begin and constructively pursue negotiations may result in a crisis of the nonproliferation regime of a scale not seen before.

Conclusion

The history of US-Soviet/Russian cooperation with respect to Article VI of the NPT leads to the following conclusions:

- The bilateral US-Soviet/Russian arms control process has been subject to its own internal logic—the logic of arms control understood as a tool to stabilize the strategic balance between the two countries—and has been only weakly related to the NPT's Article VI and the treaty's review process. This has been the case since the inception of arms control in the 1960s. At that time, the two countries sought to leverage their planned arms control negotiations to facilitate negotiations and the entry into force of the NPT. But at no point in their bilateral negotiations did they seriously entertain the possibility of taking concrete steps toward implementation of the NPT's nuclear disarmament obligations. After the entry into force of the NPT, arms control became even further divorced from nuclear disarmament.
- The two countries closely cooperated in their attempts to "sell" arms control achievements to non-nuclear-weapon states as steps toward implementation of Article VI. These attempts formed one of the foundations of their cooperation in the NPT context, along with issues such as safeguards and export control. They also consistently continued to cooperate on arms control, perceiving it as an essential tool for prevention of large-scale nuclear war. Their common front vis-à-vis non-nuclear-weapon states survived the end of the Cold War and continues until the present day. Their joint pursuit of arms control noticeably declined after the end of the Cold War and suffered major setbacks, including especially the unraveling of the system of arms control treaties created at the end of the Cold War.
- US-Russian cooperation on arms control and within the context of the NPT has become more varied and less stable than was the case during the Cold War. The essential imbalance, both in the realm of nuclear weapons and more broadly, as well Russia's dependence on nuclear weapons for its security, has made Russia less enthusiastic about nuclear arms reduction than the United States is.

The jury is still out as to whether the United States and Russia can resume the arms control process. The last remaining nuclear arms control treaty, New START, expires in 2026. Negotiating a new agreement in the remaining time will likely prove very difficult: even if the two countries agree on the scope (nuclear only or a broader package) and the focus (nuclear warheads as opposed to delivery vehicles) and if negotiations proceed in a cooperative atmosphere, it will be very difficult to resolve all technical and legal problems in the remaining time. How the United States and Russia resolve that problem remains unclear, but it is almost certain the problem will arise.

In the context of the nonproliferation regime, US-Russian cooperation will continue at least to some extent, however. The two countries share an interest both in maintaining the nonproliferation regime and in forestalling the pressure of non-nuclear-weapon states in favor of nuclear disarmament. The basis for that cooperation, however, has become narrower than was the case during the Cold War. It is cooperation "against," a negative agenda; a positive agenda has been lacking or, at best, is unstable. There is little reason to expect that these challenges will seriously undermine the nonproliferation regime, but it will certainly face continuing challenges.

CHAPTER SEVEN

When Interests Align: How US-Russian Cooperation on HEU Minimization Endures

Noah Mayhew

The United States and the Soviet Union, now Russia, have a long history of cooperation in nonproliferation. It stretches back to the negotiations of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and other early attempts to curb the spread of nuclear weapons. Since the 1990s, the two countries have actively cooperated on the security and disposition of weapon-usable nuclear material—highly enriched uranium (HEU) and plutonium.

Notable among these programs have been the Megatons to Megawatts program (1993-2013), the Trilateral Initiative (1996-2002), and the Plutonium Management and Disposition Agreement (2000-2016). Another program, created from the cooperative momentum of the 1990s and work conducted under previous programs, was the Russian Research Reactor Fuel Return (RRRFR) program, meant to eliminate HEU stockpiles associated with Soviet/Russian-supplied research reactors, many of which are in countries that were part of the Soviet Union or were in the Soviet sphere of influence. The purpose of the RRRFR program is to repatriate and secure HEU fuel from these reactors to reduce the risk of its theft and use by non-state actors.

Unlike many initiatives, which have either run their course or been sacrificed to the marked decay in US-Russian relations, the RRRFR program has continued to be implemented. Shipments of fuel—usually prepared by the host country with assistance from the United States and Russia, funded by the United States, and received by Russia— continued despite separate, heated disagreements between the United States and Russia. Among these disagreements were conflicts in Ukraine and Syria, use of chemical weapons in Syria, nuclear arms

control and, perhaps most notably, the 2016 US presidential elections. So why was the RRRFR program able to weather the downturn in US-Russian relations? The analysis in this chapter suggests that long-term partnership and strategic alignment of interests are critical to ensuring the survival of nonproliferation agreements when diplomatic relations deteriorate.

This chapter describes the origins of US-Russian cooperation on HEU minimization and the beginning of the RRRFR program. The removal of HEU from Poland is used as a case study. That effort represented the largest amount of HEU repatriated to Russia under the RRRFR program and began before the beginning of the Ukraine crisis in November 2013 and continued after.

The Origins of US-Russian Cooperation in HEU Repatriation

From 1950 through the 1980s, the United States and Soviet Union engaged in efforts to introduce developing nations to peaceful uses of nuclear energy.[1] This resulted in 40 US-origin, HEU-fueled research reactors in foreign countries and 29 Soviet-origin research reactors and other facilities, about three-quarters of which used HEU fuel.[2] In the 1970s, the United States and the Soviet Union each realized that HEU, as a primary component in nuclear weapons design, presented a proliferation risk. This realization gave rise to a number of initiatives related to HEU minimization and repatriation, meant to reduce the risk of HEU being used for malicious purposes.

First, through the 1978 Reduced Enrichment for Research and Test Reactors (RERTR) program, the United States began work with the International Atomic Energy Agency (IAEA) to remove US-origin HEU from recipient countries and to convert US-origin reactors to run on low-enriched uranium (LEU).[3] The Soviet Union, for its part, began reducing the enrichment level

[1] After World War II, technical cooperation in the peaceful uses of nuclear energy became a new avenue for geopolitical competition between the United States and the Soviet Union.
[2] Pavel Podvig, ed. "The Use of Highly-Enriched Uranium as Fuel in Russia," International Panel on Fissile Materials (IPFM), July 2017, http://fissilematerials.org/library/rr16.pdf.
[3] Argonne National Laboratory, "Reduced Enrichment for Research and Test Reactors," US Department of Energy, last modified May 18, 2020, https://www.rertr.anl.gov/.

of fuel for Soviet-supplied reactors, resulting by the 1990s in no fuel being exported above 36 percent enrichment.[4]

To complement efforts undertaken under the RERTR program, the US Department of Energy (DOE) established the Foreign Research Reactor Spent Nuclear Fuel Acceptance program in 1996 with a 10-year mandate.[5] Concurrently, the IAEA General Conference agreed that the DOE should begin trilateral discussions with Russia and the IAEA in December 1999.[6] When George W. Bush took office in 2001 as president of the United States, his administration ordered a comprehensive review of all US nonproliferation programs.[7] One result of that review was recognition that the 1996 program to accept foreign spent fuel was a success, that it was an effort worth continuing, and that Russia should be involved in reciprocal efforts.

The extensive trilateral discussions, which ran from 1999 through 2003, resulted in the RRRFR program, based on the principles of the RERTR

[4] Note that the Soviet Union never supplied uranium enriched to 90 percent in the isotope uranium-235 outside of Soviet territory although it did supply 80 percent enriched uranium to other countries. While 80 percent enriched uranium is not technically weapon grade, the Soviet government made the decision in 1978 not to supply fuel with uranium enriched to levels above 21 percent for "reactors built with Soviet technical assistance that undergo modernization or are upgraded" with the exception of exports that were deemed necessary for uninterrupted operation of a reactor. One of the last Soviet-supplied reactors that ran on fuel above 36 percent enrichment was in Libya, which already was under construction when the ban on HEU-fueled reactors went into effect. See Podvig, "The Use of Highly-Enriched Uranium," pp. 48-49.

[5] IAEA, *Return of Research Reactor Spent Fuel to the Country of Origin: Requirements for Technical and Administrative Preparations and National Experiences: Proceedings of a technical meeting held in Vienna, August 28–31, 2006,* IAEA-TECDOC-1593 (Vienna: IAEA, 2008), https://www-pub.iaea.org/MTCD/publications/PDF/TE_1593_Web.pdf.

[6] IAEA, "Meeting Report on an ad hoc Tripartite Meeting on Possible Management and Disposition in the Russian Federation of Russian Origin Fuel currently at Foreign Research Reactors," (Vienna, December 14-15, 1999), interoffice memorandum, January 18, 2000, copy in possession of author.

[7] Fred L. Wehling, "The Way Forward for US-Russian Nonproliferation Cooperation," James Martin Center for Nonproliferation Studies, July 25, 2001, https://www.nonproliferation.org/the-way-forward-for-us-russian-nonproliferation-cooperation/.

program.[8] During these discussions, 24 research reactors at 17 facilities in 16 countries were identified as desirable to include under the RRRFR program, and the US and Russian governments asked the IAEA to participate in the planning and implementation of the program.

In October 2000, IAEA Director General Mohamed ElBaradei sent letters to these countries to discern which countries with Soviet-origin HEU fuel would be amenable to participating in the repatriation effort.[9] In the drafting of the letter, the US delegation was reportedly most concerned about how the program would address reprocessing requirements, while the Russian government was concerned about overall nonproliferation goals.[10]

Of the 16 countries contacted by the IAEA, 14 responded positively.[11] However, before shipments under the RRRFR program could formally

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[8] Trisha Dedik, Igor Bolshinsky, and Allan Krass, "Russian Research Reactor Fuel Return Programme," in *Research Reactor Utilization, Safety, Decommissioning, Fuel and Waste Management: Proceedings of an international conference, 10-14 November 2003, Santiago, Chile* (Vienna: IAEA, 2005), pp. 631-636, https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1212/P1212_Papers_web.pdf.

[9] Belarus, Bulgaria, the Czech Republic, Egypt, Germany, Hungary, Kazakhstan, Latvia, Poland, Romania, Ukraine, Uzbekistan, Vietnam, and Yugoslavia responded positively. Libya did not initially respond but joined the initiative in 2004. China did not respond. North Korea was never asked. For more information, see IAEA, *Experience of Shipping Russian-origin Research Reactor Spent Fuel to the Russian Federation,* IAEA-TECDOC-1632 (Vienna: IAEA, 2009), https://www-pub.iaea.org/MTCD/Publications/PDF/te_1632_web.pdf.

[10] Some of the facilities of interest for the RRRFR program contained both fresh and spent fuel. Fresh fuel is fuel that has been fabricated for use in a nuclear reactor but has not yet been used. Spent fuel has already been irradiated in a reactor and can be reprocessed for further use in a reactor. Reprocessing was important in the RRRFR program for several reasons. First, a question in negotiations was which country would pay for spent fuel that needed to be reprocessed. The view was expressed early by the Russian delegation that the reprocessing costs should be paid by another party. Second, one can also extract plutonium, which could potentially be used in a nuclear weapon, from spent fuel. IAEA, "Meeting Report on Follow-up Tripartite Meeting on the Possible Management and Disposition in the Russian Federation of Russian Origin Fuel Currently at Foreign Research Reactors," (Vienna, March 27-28, 2000), interoffice memorandum, March 30, 2000, copy in possession of author.

[11] Egypt and China both had Soviet-built facilities that ran on LEU fuel. China did not respond to the direct general's request and Egypt responded that their facility was outside the scope of the RRRFR program.

commence, the United States and Russia had to organize fact-finding missions in cooperation with the IAEA. The goal of the missions—the first of which took place in June 2001 in Uzbekistan, Ukraine, and the former Yugoslavia—was "to refine the cost estimates and to address technical and administrative issues related to the possible future transport of fuel."[12] The fact-finding missions, a portion of which were financed by the nongovernmental Nuclear Threat Initiative, also served to help the US government decide whether or not it wanted to provide funding for HEU removal from these and other countries that would fall under the RRRFR program.[13]

The missions were considered by all parties as successful. According to Dmitri Miklush, then working in the IAEA's Department of Technical Cooperation, some of the reasons for this success included "the interest of the Member States involved who had invested their time in good preparations, the quality of the team members, the long-term cooperation between the Agency and the Member States and the fact that the missions were confirming the information and knowledge which already largely existed from earlier missions and responses to questionnaires."[14] The presence of long-term cooperation, including at the working level, and the strategic alignment of national interests are traits common to many successful US-Russian partnerships.

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[12] The Vinča reactor in Serbia was chosen, in particular because of the grim safety and security situations with the spent fuel there, which had been known to the IAEA since at least 1995. Eventually, rather than remove the fuel from that reactor through the RRRFR program, the United States, Russia, the Nuclear Threat Initiative, and the IAEA cooperated to remove the fuel. This followed a number of other quiet removals outside the RRRFR program, including Project Sapphire in 1994 (Kazakhstan) and Auburn Endeavor in 1998 (Georgia). For more, see Philipp C. Bleek, "Project Vinca: Lessons for Securing Civil Nuclear Material Stockpiles," *Nonproliferation Review,* Fall-Winter 2003, https://www.nonproliferation.org/wp-content/uploads/npr/103bleek.pdf.

[13] IAEA, "Tripartite Initiative on the Possible Management and Disposition in the Russian Federation of Russian Origin Fuel Currently at Foreign Research Reactors," note to the director general, April 1, 2001, copy in possession of author.

[14] IAEA, "Ad Hoc Tripartite Meeting on Possible Management and Disposition in the Russian Federation of Russian Origin Fuel Currently at Foreign Research Reactors," notes from the fourth meeting (Vienna, September 12-13, 2001), draft, October 7, 2001, copy in possession of author.

While the value in HEU minimization had by this time become self-apparent to many policy makers and nonproliferation experts in the United States and Russia, the terrorist attacks of September 11, 2001, highlighted in frightening fashion that cooperation in nonproliferation was essential to keeping weapons-usable material out of the hands of non-state actors.[15] This helped provide incentive for the United States to fund the program and for other countries to support it.

While the United States ultimately agreed to provide funding for the program, cost estimates for reprocessing of spent fuel and transit, which were much higher than expected by the US delegation, posed a significant challenge. From a technical meeting that took place in Moscow in June 2001, US delegates reported that any discussions aimed at procuring a breakdown of costs or a detailed explanation became "superficial and frustrating."[16] There also were issues with Russian environmental law concerning the import of spent fuel (see below).

Later that year, based on the results of the fact-finding missions, the US delegation told the Russian delegation in negotiations that the estimated costs for transportation of fresh fuel and spent fuel were acceptable but that reprocessing costs for repatriated spent fuel remained too high. Ultimately the parties decided that a first shipment from Uzbekistan would serve as a pilot case in order to demonstrate the feasibility of a long-term program and secure long-term funding.[17]

In subsequent meetings, cost issues continued to present challenges during negotiations. While the technical aspects of the program were promising, the costs to the United States initially appeared much too high. This may be

15 "Transcript of Secretary Abraham and Russian Atomic Energy Minister Rumyantsev at Announcement of Joint Statement on Fuel Return, November 12 [, 2003]," Acronym Institute, http://www.acronym.org.uk/old/archive/docs/0311/doc07.htm.
16 Collin Powell, "Moscow Technical Meeting on Proposed Russian Research Reactor Fuel Return Program," diplomatic cable, June 1 2001, copy in possession of author.
17 IAEA, "Ad Hoc Tripartite Meeting on Possible Management and Disposition in the Russian Federation of Russian Origin Fuel Currently at Foreign Research Reactors," notes from the fourth meeting (Vienna, September 12-13, 2001), draft, October 7, 2001, copy in possession of author.

attributable to constraints on Russia's national budget, which made it difficult for Russia to cover even the parts of the program that would take place on its own territory.[18] Reprocessing research reactor fuel is not profitable, instead more likely to yield a zero-balance situation, neither generating profit nor incurring debt. As Russia viewed the RRRFR program in part as a commercial endeavor from its side, funding from the United States would be necessary for Russia to participate.

However, as negotiations continued, this concern ceased to be expressed, suggesting that either the fact-finding missions led Russia to lower cost estimates or inspired the US side to accept higher estimates. Whatever the reason, US funding for the program became available. In this regard, much of the funding for the overall program came from the United States, including through voluntary contributions to the IAEA. In 2006, Russia launched a project on radiological security, which regularized the activities of the Dmitrovgrad and Mayak facilities in the national budget, allowing Russia to cover all activities related to the RRRFR program on its territory from then on.[19]

Another issue addressed during the negotiations was transit, in particular through third countries. Transit problems had a few dimensions: transit from the host country to Russia, which could be legally facilitated using existing nuclear cooperation agreements or the conclusion of new agreements; transit through third countries, also requiring supplementary agreements; and domestic legislation in Russia for the receipt of spent fuel.

Aside from financing and transit, the negotiations were characterized by pragmatism; they sought to determine which countries would qualify for the RRRFR program and what the requirements for participation would be.

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[18] Russian expert familiar with Russia's role in the RRRFR program, telephone interview with author, June 11, 2020 (hereafter cited as "Interview with Russian expert").

[19] This ongoing program is called the "Federal Target Program on Ensuring Nuclear and Radiation Safety for 2008 for the Period until 2015" (unofficial translation from Russian; original text: "Федеральной целевой программы 'Обеспечение ядерной и радиационной безопасности на 2008 год и на период до 2015 года'"). For more information, see Alexander Bychkov and Zoran Drace, "Tackling Russia's Radiation Legacy," *Nuclear Engineering International,* March 2016, pp. 24-27.

It was decided early on, for example, that participating countries needed to convert the reactors subject to the agreement to run on LEU if they were to receive funding from the United States so that the repatriation process would not be endless.

In many ways, the late 1990s and early 2000s were marked by the political will to overcome legal, bureaucratic, and technical barriers to cooperation in nuclear nonproliferation and nuclear security.

The DOE tabled a government-to-government agreement with the Ministry for Atomic Energy of the Russian Federation (MinAtom) in February 2003 to provide a legal basis for the RRRFR program, as well as to outline terms and conditions related to the repatriation effort.[20] But before Russia could sign the agreement, it had to pass domestic laws related to the intake of the spent HEU fuel, as well as disposal of any waste resulting from the processing of spent fuel.[21] However, interest in the program was high and fresh HEU fuel did not need to be further codified under Russian law in order to import it.

Before the 10-year agreement was finally signed on May 27, 2004, the United States and Russia began preparing and dispatching shipments of fresh HEU fuel back to Russia.[22] Shipments of fresh fuel from 2002 to early 2004 from

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[20] Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning Cooperation for the Transfer of Russian-Produced Research Reactor Nuclear Fuel to the Russian Federation, Moscow, May 27, 2004, https://fas.org/irp/world/russia/fuel-2004.pdf.

[21] These changes in domestic law were introduced as amendments to a 1991 ban on the import of radioactive waste and materials from other countries for storage or disposal. "On Protection of the Environment" [in Russian], December 19, 1991, https://web.archive.org/web/20050506110152/http://wbase.duma.gov.ru/ntc/vdoc.asp?kl=8688. The changes were codified in 2001. "On Amendments to the Federal Law 'On the Use of Atomic Energy'" [in Russian], June 6, 2001, http://docs.cntd.ru/document/901792260. The 2001 decree provided a basis for guidelines that were approved by the Russian government in 2003; see http://docs.cntd.ru/document/901868090.

[22] In December 2013, even as the Ukraine crisis was ramping up, the United States and Russia extended the agreement for another 10 years through an exchange of diplomatic notes. See the Amending and Extending Agreement of May 27, 2004, December 17, 2013, https://www.state.gov/wp-content/uploads/2019/02/13-1227-Russian-Federation-Atom-Energ-Amend-and-Extend.pdf.

Serbia,[23] Romania,[24] Bulgaria,[25] and Libya[26] were all prepared and shipped before the legal framework was signed. The first shipment to take place after the legal framework entered into force was from Uzbekistan in September 2004.

Once imported, fresh fuel would be sent to the Research Institute of Atomic Reactors (RIIAR) in Dmitrovgrad or to the Luch Scientific Production Association in Podolsk for downblending into LEU. RIIAR was involved from earlier stages because of its experience in working with fresh fuel and downblending, as well as its relationship with and proximity to the Sosny Research and Development Company, which handled much of the transit from the Russian side.[27] Once the fresh fuel had been downblended, it could then be sold to TVEL, the nuclear fuel supplier branch of the Russian Federal Atomic Energy Agency (Rosatom).[28]

Spent fuel, on the other hand would be sent to the Mayak Production Association for reprocessing and eventual integration into Russian civilian energy programs.[29] This included the use of reprocessing byproducts in fuel

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23 US Department of State, Office of the Spokesman, "Project Vinca," August 23, 2002, https://2001-2009.state.gov/r/pa/prs/ps/2002/12962.htm.

24 US Department of State, "The United States, Russian Federation, Romania and the International Atomic Energy Agency Cooperate on Nonproliferation," September 22, 2003, https://2001-2009.state.gov/p/eur/rls/prsrl/2003/24548.htm. Nine other shipments were dispatched between 1991 and 2003, but none of them fell under the purview of the RRRFR program. See Podvig, "The Use of Highly-Enriched Uranium."

25 Global Security Newswire, "Joint U.S.-Russian Operation Recovers HEU From Bulgarian Research Reactor," December 29, 2003, https://www.nti.org/gsn/article/joint-us-russian-operation-recovers-heu-from-bulgarian-research-reactor/.

26 IAEA, "Removal of High-Enriched Uranium in Libyan Arab Jamahiriya," March 8, 2004, https://www.iaea.org/newscenter/news/removal-high-enriched-uranium-libyan-arab-jamahiriya.

27 Interview with Russian expert.

28 "Russia's Nuclear Fuel Cycle," World Nuclear Association, updated September 2020, https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/russia-nuclear-fuel-cycle.aspx.

29 DOE officials, Zoom interview with author, April 1, 2020 (hereafter cited as "Interview with DOE officials"), and US Department of State, "Project Vinca."

fabrication for Russia's VVER and RBMK reactors, the latter of which has long used recycled fuel.[30]

Former officials who were involved in early discussions of this endeavor remarked that technical barriers were obstacles to be overcome rather than points of contention. For example, because Russia found value in the HEU that would be repatriated, it was willing to provide in-kind support, such as covering the storage and transportation costs within its own borders. Russia also provided 16 TUK-19 casks, as well as four more casks at other facilities used to transport HEU.[31] However, the TUK-19 casks were licensed only for rail transit and could hold a relatively limited number of fuel elements. As a result, the IAEA purchased 10 more VPVR/M casks from a Czech company, Škoda, and the Czech government purchased an additional six.[32] The Škoda VPVR/M casks were used for sea, road, and railroad transport, and could hold a higher number of fuel elements. For air transport, the Škoda casks could also be paired with TUK-145/C casks.

One day before the legal framework for the RRRFR program was signed, US Secretary of Energy Spencer Abraham announced to senior IAEA officials the establishment of the Global Threat Reduction Initiative (GTRI), a new program meant to "minimize as quickly as possible the amount of nuclear material available that could be used for nuclear weapons."[33] The GTRI was a product of the post-9/11 drive to eliminate nuclear material wherever possible and encompassed various material protection, control, and accountancy efforts of the US government, including the RRRFR program and its analogous program aimed at US-origin material. While the establishment of the GTRI did not change the nature of the repatriation effort, it did give the RRRFR program (and other programs) a steady line of funding to carry out its work and a heightened platform

30 Interview with Russian expert.
31 Interview with DOE officials.
32 Interview with DOE officials.
33 IAEA, "IAEA Welcomes US New Global Threat Reduction Initiative," May 27 2004, https://www.iaea.org/newscenter/news/iaea-welcomes-us-new-global-threat-reduction-initiative.

within the bureaucratic process of the DOE's National Nuclear Security Administration (NNSA).[34]

As a result of this effort, Russian-origin HEU has been completely removed from all but five of the 16 countries that initially received ElBaradei's letter. The Russian-origin HEU repatriated under the RRRFR program comprises nearly 2,300 kilograms (kg).[35]

The Polish Case (2006-2016)

In November 2000, Poland was among the first countries to respond positively to ElBaradei's inquiry to countries that qualified for the RRRFR program. Poland's National Atomic Energy Agency and its Institute of Atomic Energy (IAE) were interested in taking part in the RRRFR program chiefly for the opportunity to export the spent HEU fuel on Polish territory. Poland lacks a reprocessing capability and had only about 50 years of storage capacity for the spent fuel.[36] Moreover, Poland found value in the cost reductions associated with running research reactors on LEU fuel rather than HEU fuel.[37]

Of the countries that participated in the RRRFR program, Poland had the largest amount of Russian-origin HEU that was repatriated over a 10-year

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[34] The GTRI has since been renamed as the Material Management and Minimization, or M3, program in the NNSA.

[35] Russian-origin HEU remains in Belarus, China, Germany, Kazakhstan, and North Korea. Upcoming shipments are under discussion for Belarus and Kazakhstan. China did not reply to Director General ElBaradei's letter and has not engaged with the RRRFR program. Germany initially expressed interest, but reversed its decision in 2010, citing safety concerns related to reprocessing at the Mayak facility. North Korea was not contacted. For more information, see I. Bolshinsky, J. Dewes, S. Moses, and K. Bateman, "Current Status of the Russian Research Reactor Fuel Return Program," in "Session Abstracts" [for the RERTR-2019 International Meeting, Zagreb, Croatia, October 6-9 2019], https://www.rertr.anl.gov/RERTR40/pdfs/RERTR-2019-program.pdf.

[36] Polish expert familiar with Poland's implementation of the RRRFR program, email interview with author, April 27, 2020 (hereafter cited as "Interview with Polish expert").

[37] IAEA, "Sensitive Nuclear Material Removed From Poland," August 10, 2006, https://www.iaea.org/newscenter/news/sensitive-nuclear-material-removed-poland.

period—more than 700 kg from the Maria and EWA reactors.[38] The Maria reactor is a Russian-designed research reactor that originally relied on HEU fuel.[39] Most of that fuel was located at the IAE fuel storage site, now part of the National Centre for Nuclear Research Radioisotope Centre (NCNC or POLATOM), in Otwock-Świerk.[40] The EWA research reactor, which is on the same site as the Maria reactor, was shut down in 1995 and envisioned as a supplementary dry storage facility after decommissioning.[41]

The vast majority of the HEU repatriated from the Maria and EWA reactors was spent fuel, at 630.8 kg. The remaining 75.4 kg was fresh fuel. Although there was less of it, two of the three shipments of fresh fuel were made before any spent fuel was repatriated. This is at least in part because Russia was able to accept fresh, Russian-origin nuclear fuel under the legislation that it had already passed without extra hurdles, but Poland and other countries were required to conclude a separate agreement with Russia to transfer spent fuel.

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38 NNSA, "Secretary Moniz Announces Removal of All Highly Enriched Uranium from Poland," September 26, 2016, https://www.energy.gov/nnsa/articles/secretary-moniz-announces-removal-all-highly-enriched-uranium-poland.

39 Spent fuel in Poland has also been stored at the 19A repository at Poland's Radioactive Waste Management Plant (ZUOP) due to capacity issues, but had to be returned to the Maria reactor's storage pools due to "technological limitations" of the 19A repository. Both facilities are located at POLATOM. For more information, see Łukasz Murawski, "Experience with spent nuclear fuel management in Poland," National Centre for Nuclear Research, Świerk, November 15, 2019, https://nucleus.iaea.org/sites/connect/SFMpublic/TM%20on%20Cost%20Estimation%20Methodologies%20for%20Spent%20Fuel/Murawski_SWIERK_Poland.pdf.

40 "History of the POLATOM's activity begun in the 1950s and was connected with the Institute of Nuclear Research. In 1990 the Radioisotope Centre POLATOM was created as a part of Institute of Atomic Energy. In February 2005 the limited liability company Radioisotope Centre POLATOM was separated to deal with manufacturing and commercial activity. As the next step Institute of Atomic Energy and Institute of Nuclear Studies was merged to National Centre for Nuclear Research." See Polatom, "About Us," n.d., https://www.polatom.pl/en/page/about-us.

41 "EWA reactor launched 60 years ago," National Centre for Nuclear Research, Poland, June 14, 2018, https://www.ncbj.gov.pl/en/aktualnosci/ewa-reactor-launched-60-years-ago.

Poland began repatriating spent HEU fuel only when it concluded such an agreement in September 2009.[42]

As with Russia, Poland took time to put in place the proper legislation to export the HEU that fell under the program. The repatriation effort from Poland began in 2006, two years after the legal framework was put into place. There were several reasons for this lag.

First, the repatriation effort began on a priority basis, meaning that HEU was first removed from facilities that the United States, Russia, and the IAEA agreed posed higher safety and security concerns. While the Polish government was working on internal legislation to facilitate the export of the fuel, shipments began from Uzbekistan, which was given the highest priority, and the Czech Republic.[43]

Second, Poland needed to solve a number of other bureaucratic and legal issues including making a decision about which government agency would be responsible for repatriation; concluding external agreements, including those referenced with the United States, Russia, and the IAEA, as well as with transit countries (Ukraine and Belarus); and finalizing domestic legislation for the export of the fuel.

Third, there were technical challenges to overcome, some of them common to all facilities under the RRRFR program and others unique to the Maria reactor. As noted above, one of the requirements under the US-Russia-IAEA legal framework was that all of the reactors involved in the RRRFR program had to be converted to run on LEU fuel so that HEU repatriation did not

[42] "Agreement Between the Government of the Russian Federation and the Government of the Republic of Poland on Cooperation in the Import to the Russian Federation of Spent Nuclear Research Reactor Fuel" [in Russian], September 1, 2009, http://docs.cntd.ru/document/902178648.

[43] Interview with DOE officials.

become a permanent activity.[44] However, the converted assembly design for the Maria reactor was "unique" [45] and required extensive safety testing and feasibility studies. These included measures to ensure the safe use of new fuel enriched to 19.75 percent, which was supplied by Areva (CERCA), and the irradiation of lead test assemblies before the core could be converted by gradual replacement of the old HEU fuel elements with new LEU fuel elements.[46] Following successful tests, the conversion took place from 2009 until the last highly enriched fuel element in the Maria reactor was replaced with an LEU element in 2014.[47] US experts from Argonne National Laboratory collaborated with Polish experts on technical issues throughout the process of converting the reactor. [48]

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[44] The Maria reactor originally operated on 80 percent enriched HEU and later was converted to run on 36 percent HEU in 1999. For more information, see Grzegorz Krzysztoszek, "Maria research reactor conversion to LEU fuel," in IAEA, *International Conference on Research Reactors: Safe Management and Effective Utilization* (extended synopses of papers presented at the IAEA conference in Sydney, November 5-9, 2007), https://inis.iaea.org/collection/NCLCollectionStore/_Public/39/043/39043136.pdf, IAEA-CN-156/S-30.

[45] Krzysztoszek, "Maria research reactor conversion."

[46] In addition to safety testing and feasibility studies, the conversion to operation on LEU required upgrades of the reactor pump system, measurement of safety coefficients, constant fuel channel monitoring, vibration testing of new fuel, and neutronic and thermal-hydraulic calculations based on the core conversion. For more information, see Marek Migdal and T. Krok, "Brief history of MARIA conversion from HEU to LEU," paper presented at RERTR 2014 – 35th International Meeting on Reduced Enrichment for Research and Test Reactors, Vienna, October 12-16, 2014, https://www.rertr.anl.gov/RERTR35/pdfs/S3P5_Paper_Migda.pdf.

[47] National Centre for Nuclear Research, *Annual Report 2014,* http://ncbj.edu.pl/download/ar-2014/AR_2014_b.pdf.

[48] In September 2009, Poland and the United States also concluded a cooperation agreement required under the RRRFR program. Among the agreement's provisions were that DOE assistance would be provided to Poland at no cost and that the agreement would cover the provision of "technical assistance, safety engineering services, planning and project management support," and assistance related to procurement. See Agreement Between the Department of Energy of the United States of America and the Minister of Economy of the Republic of Poland Concerning Cooperation in the Area of Countering the Proliferation of Nuclear Materials and Technologies, September 11, 2009, https://2009-2017.state.gov/documents/organization/185778.pdf.

Under the RRRFR program, shipments of spent and fresh fuel were made via public roads, railways, seagoing vessels, and air transport. To date, repatriation of HEU from the Maria reactor is the only case in which all four transportation modes were utilized. That is because the licensing of car and railroad transport with spent fuel could be difficult in Ukraine and Belarus, the two countries the fuel had to cross as it moved from Poland to Russia. To avoid this difficulty, a large portion of the fuel was airlifted or transported via ship through the Baltic Sea to Murmansk, where Russian icebreakers are fueled. Another technical challenge during repatriation from the Maria reactor was the size and shape of the fuel, requiring modifications in order to fit into the casks.

As POLATOM was preparing for and implementing the conversion to LEU fuel, shipments of HEU fuel were already making their way to Russia, beginning with the first in August 2006. The United States, Russia, the IAEA, and Poland sent HEU from Otwock-Świerk for 10 years over 11 shipments for a total of 706.2 kg.

The distribution of roles and responsibilities among the four parties was a critical factor in the success of the Polish repatriation effort and, indeed, the entire RRRFR Program. According to a Polish expert, the "involvement of each of the parties … resulted from the possibility of implementing individual stages of work."[49]

The distribution of work in the Polish case was as follows:

- The United States coordinated the process, provided technical assistance to Poland when required, supervised the shipments, and funded a large portion of the program.
- Poland was responsible for technical solutions and licensing during the loading and transportation of the HEU in Poland.
- Russia was responsible for receiving the HEU and transporting it within its territory, as well as for preparing the necessary documentation required for importing the spent fuel. Once the material was on Russian territory, Russia was responsible for storage, as well as subsequent activities such as downblending and reprocessing.

[49] Interview with Polish expert.

- The IAEA provided technical expertise when required and monitored the shipments for safety, security, safeguards, and other technical matters as requested by the parties.

The last shipment of HEU left Poland in September 2016, making Poland the 31st country (plus Taiwan) to be considered free of HEU.[50]

Lessons Learned

The success of the HEU repatriation effort from the Maria reactor, as well as the continued success of the RRRFR Program overall, is related primarily to two factors. The first is long-term partnership and close coordination at high levels through specialized government agencies such as Rosatom and the NNSA, as well as at the ministerial level. The second is strategic alignment of interests and the political will to maintain those interests and keep commitments made under the program.

Partnership and Coordination

The long-term partnership and high-level coordination of the RRRFR program dates back to its inception, when the United States, Russia, and the IAEA were meeting to discuss the form of the project and its legal framework. US and Russian representatives both insisted on the involvement of the IAEA and agreed on all of the essential elements of the program early on. Together, they clearly identified what had to be done in participating countries, where the funding for implementation would come from, and what roles each party would play. The parties have maintained this coordination through the years, including in the context of the Joint Coordination Commission (JCC) and through technical meetings held at the IAEA to share lessons learned from the program's implementation.

[50] The Maria reactor will continue to use HEU for the production of medical isotopes. See IPFM, "All HEU fuel removed from Poland," September 16, 2016, http://fissilematerials.org/blog/2016/09/all_heu_fuel_removed_from.html; and IPFM, "United States to supply HEU for Mo-99 production in Europe," July 21, 2016, http://fissilematerials.org/blog/2016/07/united_states_to_supply_h_1.html.

An important aspect of partnership and coordination has also been the political will to keep up momentum. Early on, the executive agents designated to implement the program (the DOE and Rosatom) empowered civil nuclear bodies to implement critical parts of the program. In particular, the Sosny Research and Development Company in Russia has been involved in the RRRFR program since 2002 and has contributed significantly to research and development related to HEU transportation.[51] In addition to the NNSA, the United States has heavily involved its national laboratories in the program. These partnerships demonstrated commitment to the program and contributed to its ability to continue operating when the state of relations between the United States and Russia worsened.

The same is true for the repatriation of HEU from the Maria reactor. US, Russian, and Polish counterparts cooperated on the technical issues related to repatriation for years before the shipments began and through the years of its implementation. Moreover, close coordination allowed for a very flexible transportation system, for example the use of all four modes of transportation for the sake of safe and expedited shipping from the Maria reactor. One reason for using all four was that each transport of spent fuel required a separate transit agreement with third countries. Participants in the RRRFR program knew this and were able to find other routes to facilitate the shipments.

Alignment of Interests

Perhaps more important, however, was that the parties' separate interests aligned behind one endeavor. While the overarching task was to eliminate HEU from Soviet-supplied research reactors and repatriate it to Russia, each party had different reasons for committing to the project.

The United States has had a long-standing interest in promoting HEU minimization both domestically and abroad. When the RRRFR program was consolidated with other material management and minimization programs

[51] Alexey Ivashchenko, "Participation of Sosny R&D Company in International Research Reactor Fuel Take-Back Programs" (paper presented at the Technical Meeting on Lessons Learned from High Enriched Uranium Take-back Programs, Gdansk, Poland, June 17-20, 2019), https://sosnycompany.com/files/publications/RRRFR_2019_Ivashchenko.pdf.

under the GTRI, the work done under previous programs and the budget behind it heightened the NNSA's ability to act on this interest.

Russia also had interest in HEU repatriation, both to reduce HEU stockpiles abroad and for the technical cooperation experience that cooperation under the GTRI provides. More than that, though, Russia was financially motivated to participate in the program. The HEU it received was funneled into its energy programs and came to it very cheaply. The United States paid for the majority of the activities outside of Russian territory.

The IAEA, as part of its mandate, provides support at the request of countries in nuclear safety and security, both of which are important considerations in the transportation of nuclear material and the conversion of facilities. Moreover, the transfer of nuclear material from an NPT non-nuclear-weapon state (in this case Poland) to a nuclear-weapon state (Russia) requires the application of IAEA safeguards to verify that material is not diverted prior to or during transport. In addition to fulfilling some its core functions in the RRRFR program, the IAEA's work in safeguards may also have been made easier. Prior to the RRRFR program, different research reactors ran on fuel of varying compositions and enrichment levels. Because the new fuels are largely standardized, material accountancy has become a more streamlined process.

Poland benefited from participation in the RRRFR program chiefly because it solved the problem of the storage and management of spent fuel, which would have become a dire problem within 20 years when the Maria reactor's storage pools would likely have become full. Beyond this, the technical cooperation provided to Poland during the conversion of the reactor and transport of the fuel was useful for the Polish nuclear industry, utilizing technical and organizational solutions previously tested in Czech and Hungarian reactors.[52]

Finally, the technical cooperation aspect of the program contributed significantly to the domestic capabilities of all countries involved. As an example, before the RRRFR program, Russia's Mayak facility generally tried

[52] Interview with Polish expert.

to avoid reprocessing fuel with irregular content, such as uranium silicide. The program gave Mayak the opportunity to adopt new technology and methods to reprocess many different kinds of fuel, thus making Mayak a unique facility.[53]

While all the parties and participating countries of the RRRFR program recognize the importance of nonproliferation and, in this case, keeping weapons-usable material out of the hands of non-state actors, it is the interest of each individual country that provides the necessary incentive for the RRRFR program to succeed.

Conclusions

The narrative surrounding nonproliferation and arms control in Washington and Moscow, once characterized by what could and should be done, is now characterized by what cannot be done. Issues and conflicts that were once kept separate from the work in the nuclear domain have been allowed to interfere with US-Russian nuclear cooperation. This disinterest in and occasional malice toward nuclear nonproliferation and nuclear security activities, such as HEU minimization, has led to the untimely demise of a number of agreements related to nonproliferation and arms control. In the fissile material domain, this includes the Trilateral Initiative and the Plutonium Management and Disposition Agreement.

The RRRFR program has, to date, removed all of the HEU from 12 countries, and Russia has continued to receive shipments of HEU from countries including Kazakhstan, Uzbekistan, and Georgia. Discussions are ongoing with Belarus and Kazakhstan for the removal of additional HEU fuel.

When relations between the United States and Russia soured over the course of the 2010s, especially after the beginning of the Ukraine crisis, one might have expected the RRRFR repatriation effort in Poland to collapse as well. But the 2004 legal framework was extended until 2024 only a month after the Ukraine crisis began in December 2013, and at least 10 shipments of HEU have been repatriated to Russia since then.

[53] Interview with Russian expert.

Why was this program able to survive the downturn in relations after so many others had not? US and Russian experts interviewed for this case study remarked that the program was working and serving everyone's interest, so there was no reason to abandon it. From the US perspective, the benefit of securing weapon-usable material outweighed the consternation that stemmed from the Ukraine crisis. Moreover, in the opinion of this author, as important as the program is to global security, it is not sufficiently well known in US policy circles to be an obvious target in times of political tension. From the Russian perspective, this is a commercial program that brings profit and technical capacity to Russia, as well as security to many regions around Russia.

Similarly, the Polish government did not terminate its participation in the RRRFR program after the Ukraine crisis began, despite notable anti-Russian sentiment. This is likely because repatriation of HEU was of benefit to the Polish nuclear industry, solving a long-standing problem with spent fuel storage.

Bearing this in mind, the importance of high-level attention to these issues, long-term partnerships, and strategic alignment of interests cannot be overstated.

When an initiative is started, it must be thoroughly ingrained in the legislative structures of the implementing parties, as the RRRFR program was. Neutral partners, such as the IAEA, must be heavily involved from the inception of these initiatives, providing a neutral voice to the implementers and to external stakeholders. For example, the letter to the RRRFR program's participating governments was not from the United States or Russia, but rather from the IAEA. In addition, the RRRFR program's JCC does not meet ad hoc, but rather annually, providing a mechanism for continued, high-level dialogue on the program. When initiatives are born, the individuals who participate in them must also do all they can to safeguard them from external stresses. Successful programs such as RRRFR have survived not just because of the reasons outlined above, but also because the individuals involved in them recognized their importance and championed them. As evidence of this, the RRRFR program was extended for 10 years in December 2013, despite the effect

the Ukraine crisis, which began a month earlier, was having on the US-Russian relationship.

Finally, the RRRFR program serves the interests of each of its participants, as outlined above. These interests happened to align and contribute to the overall goal of the RRRFR program—ensuring that Russian-origin, weapon-usable material was safe from non-state actors. But the United States, Russia, the IAEA, and other participating countries also benefited individually as a result of the program. For future initiatives, the architects must seek to align individual benefits with overall goals to ensure sustainability and success. As a practical matter, it is when the interests of countries align that cooperative efforts are most successful in nuclear nonproliferation and global security.

CHAPTER EIGHT

Reflections on the Past and Thoughts about the Future

William C. Potter and Sarah Bidgood

The perils of the current US-Russian relationship are hard to overstate. Although the present dangers are not without precedent, a new feature of the contemporary scene is the disappearance of a shared sense of responsibility for, and commitment to, alleviating the existential dangers posed by the presence and proliferation of nuclear weapons. It remains to be seen if a collaborative approach to mitigating this nuclear predicament can be rekindled and sustained and, if so, what form this reengagement might take.

The preceding case studies detail different modes of US-Russian nuclear cooperation that yielded tangible results in the past and merit consideration today. While their direct relevance is moderated by discontinuities between the past and current international environment, as well as by increasingly inhospitable domestic politics in both countries, one can discern areas where it still should be possible to engage collaboratively in the pursuit of common nonproliferation objectives. A review of past instances of cooperation also may be instructive in teasing out certain lessons conducive to the preservation of at least a modicum of cooperative behavior.

The Demise of Nuclear Cooperation

During much of the Cold War period following the Cuban Missile Crisis—and also during the first two decades of the post-Soviet era—leaders in Moscow and Washington made clear their determination to forge common ground on nuclear arms control and nonproliferation issues. They did so not out of any newfound sense of morality or receptivity to the other side's

ideology, but because of the stark realization that the mutual survival of their societies depended on nuclear risk reduction. The nuclear superpowers had survived one very close call in 1962, and although that realization did not immediately produce an altered image of the adversary, it soon led to recognition by leaders in both countries of the need to establish guardrails and rules of the road lest the arms race lead to a literal dead end.

The avoidance of a nuclear holocaust was the overarching shared objective that made possible negotiation of a number of significant bilateral and multilateral nuclear arms control accords, including the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Anti-Ballistic Missile (ABM) Treaty, Strategic Arms Limitation Talks (SALT) agreements, the Intermediate-Range Nuclear Forces (INF) Treaty, the Strategic Arms Reduction Treaty (START), the Comprehensive Nuclear-Test-Ban Treaty (CTBT), and New START. Regrettably, the majority of these formal accords are notable today for the fact that they either have not entered into force or were abrogated after they had done so.

The erosion of the arms control foundation that had been built during the past half century has been underway for a long time and can be traced back at least as far as 2002 when the United States withdrew from the 1972 ABM Treaty.[1] To be sure, there were some positive nuclear arms control developments in the subsequent decade, especially with respect to the "arms control and disarmament spring" of 2010, which witnessed the adoption of an impressive nuclear disarmament agenda at the NPT Review Conference, conclusion of New START, and initiation of an ambitious Nuclear Security Summit process. By the time of the Russian annexation of Crimea in

[1] Some analysts see the June 1997 decision to expand NATO to include the Czech Republic, Hungry, and Poland and the June 1999 NATO bombing of Yugoslavia as foreshadowing the downturn in US-Russian relations in general and the erosion of nuclear cooperation in particular. Others treat the deterioration of US-Russian nuclear cooperation as part of a broader transformation of the global nuclear order. See, for example, Steven E. Miller, "The Rise and Decline of Global Nuclear Order," in Steven E. Miller and Alexey Arbatov, eds., "Nuclear Perils in a New Era: Bringing Perspective to the Nuclear Choices Facing Russia and the United States" (Cambridge, MA: American Academy of Arts and Sciences, 2021), pp. 3-39, and Andrew Futter, "Toward a Third Nuclear Age?" CNS Seminar, May 27, 2021, https://youtu.be/-T_A3hpUsdI.

2014, however, the chill in US-Russian relations had become frigid. It was apparent to most observers that, while the two countries might continue to cooperate in a few selected nuclear spheres —such as strengthening the NPT, combating the threat of nuclear terrorism, and restraining Iran's nuclear ambitions—the INF Treaty was in jeopardy, prospects for early entry into force of the CTBT were nil, and the 1991-92 Presidential Nuclear Initiatives (PNIs) were no longer effective barriers to the deployment of nonstrategic nuclear weapons.

This freeze in US-Russia cooperation on nuclear issues has led to greater instability in superpower relations and an increased likelihood of escalation as a result of miscalculation or miscommunication. These risks are mitigated to some extent by the many valuable—though often overlooked—US-Russian nuclear risk reduction agreements and confidence-building measures (CBMs) that were concluded by Washington and Moscow in the post-Cuban Missile Crisis period. Among the most notable were the 1963 Memorandum of Understanding between the United States of America and the Union of Soviet Socialist Republics regarding the Establishment of a Direct Communications Link, the 1971 Agreement on Measures to Reduce the Outbreak of Nuclear War, the 1972 Agreement on Basic Principles of Relations Between the United States and the Union of Soviet Socialist Republics, the 1972 US-Soviet Agreement on the Prevention of Incidents On or Over the High Seas, and the 1973 Agreement on the Prevention of Nuclear War. Most of these CBMs remain in place. However, some are in need of update due to technical developments, others suffer from a lack of attention, and still others are simply ignored when they pose inconvenient constraints on the two parties.

In addition to these agreements and politically binding initiatives, on occasion US and Russian interests in the nuclear sector have coincided sufficiently to induce behavior that was perceived as mutually beneficial even if it was not always the product of a formal negotiation. Examples of this latter category of policy were coordinated action in the export control sphere, routine policy coordination during the NPT review process, high-level, bilateral nonproliferation consultations every six months at the level of assistant secretary of state or deputy foreign minister, and the parallel PNI declarations.

While not fitting neatly into any of the aforementioned categories, one also should note the exceptionally important examples of US-Russian collaboration that took place under the auspices of the Nunn-Lugar Cooperative Threat Reduction program, the "Megatons to Megawatts" program, and a partnership involving the nuclear weapon laboratories of the United States and Russia. Regrettably, these innovative nonproliferation initiatives also have ceased, leading to a situation in which the habit and institutional memory of US-Russian nonproliferation cooperation has been lost, deep personal relationships among institutional advocates for cooperation in both capitals have atrophied, and an assessment of what is and is not politically viable or productive in terms of nonproliferation policy coordination is founded less on experience than on speculation.

Perhaps most troubling, few policy makers in either the United States or Russia appear to be particularly troubled by the unraveling of the nuclear arms control fabric and the possible consequences of this more unpredictable, less regulated, and more competitive international environment. Instead of being more introspective and questioning of the dangers posed by the current nuclear predicament, leaders exhibit continuing complacency, an exaggerated faith in technical solutions to the problems of crisis instability, and misplaced confidence in their ability to calibrate appropriate responses to ambiguous signals such as those involving early warning of imminent attack.

Where Do US and Russian Nuclear Interests and Threat Perceptions Still Coincide or Converge?

There is surprisingly little empirical research on evolving US and Russian leadership perceptions of nuclear proliferation threats and shared national security interests in that domain. The case studies in this volume, however, suggest a number of areas in which leadership threat perceptions and security interests coincide, or at least do not clash. They also indicate the diminished correspondence of perceived threats and common interests involving some issues that previously were high on the US-Soviet/Russian bilateral agenda.

1. *Danger of proliferation spread and nuclear use*

The United States and Russia continue to express public support for the NPT and the contributions it has made to international peace and security during the past half century. There is no reason to doubt the sincerity of these pronouncements, as both states have always attached primary importance to the nonproliferation dimension of the treaty while accepting the political necessity of periodically reiterating their commitment to the treaty's Article VI disarmament provisions. Indeed, as Nikolai Sokov notes in his chapter, both Washington and Moscow initially had sought to limit reference to the elimination of nuclear weapons to the treaty's preamble rather than the main text so that it could be interpreted as a political statement about intention rather than a legally binding obligation.

In Sokov's view, the bilateral nuclear arms control dynamic was driven by its own internal logic related to considerations of strategic stability and has operated largely independently of NPT developments. Nonetheless, the joint pursuit of arms control was viewed by the two nuclear-weapon states as paying useful dividends in the NPT review process by deflecting criticism by their non-nuclear-weapon-state counterparts. While Sokov may overstate the degree to which the leadership in Moscow and Washington regarded the NPT's disarmament provisions exclusively in transactional and instrumental terms, he is correct in highlighting the past and continuing shared interest on the part of the two countries in fending off pressure by the non-nuclear-weapon states to move more expeditiously toward the elimination of nuclear weapons. Regrettably, he also finds that the scope of US-Russian cooperation in the NPT review process has narrowed markedly since the period of the Cold War and today consists mainly of cooperation to forestall action by disarmament advocates.

If the two countries—former Cold War rivals but also nonproliferation partners—find it increasingly difficult to cooperate on NPT issues, do they continue to share an assessment of the risks of nuclear weapon use and the measures necessary to avert that occurrence? None of the contributors to this volume directly address this issue, but one can infer leadership perspectives based on their analyses of the rise and demise of several important nuclear initiatives.

Sokov, for example, bemoans the difficulties the two parties have faced in the post-Cold War period in concluding new arms control treaties while jettisoning prior accords, most prominently the ABM and INF Treaties. He also underscores the limited amount of time spent in nuclear arms control negotiations since the collapse of the Soviet Union and the prolonged drought in formal talks. This lengthy pause leads him to surmise that the public and the elites in the two countries have lost their fear of nuclear war and no longer regard efforts to reduce the danger as urgent. Possibly indicative of this development was the inability of the nuclear-weapon states during the last NPT review cycle to support even the basic principle that a nuclear war cannot be won and must never be fought.[2]

While the pace of negotiated bilateral nuclear agreements slowed in the 1990s, nuclear disarmament and risk reduction were pursued by other means. In part, this pause was due to a reassessment by the United States of the nature of the nuclear threat at the time and the perceived need to act more quickly than formal negotiations would permit. As Jeremy Faust demonstrates in his analysis of the 1991-92 Presidential Nuclear Initiatives, the pending collapse of the Soviet Union persuaded President George H. W. Bush that urgent action was required to prevent the possible loss (by sale or seizure) of small and relatively portable tactical nuclear weapons that were dispersed across an increasingly unstable Soviet Union. Although Soviet policy makers had already acted to consolidate much of the country's tactical nuclear force and would have preferred to address the remaining danger of "loose nukes" through more traditional, formal negotiations, President Bush judged the risk to be too acute. To respond to the need for prompt action, he authorized a series of unilateral reductions of US tactical nuclear weapons and invited his Soviet counterpart to reciprocate. Both Mikhail Gorbachev and his successor, Boris Yeltsin, accepted this informal but coordinated approach to arms control, which resulted not only in a significant reduction in the risk of diversion and unauthorized use of nuclear weapons, but also in more substantial nuclear disarmament than prior negotiated accords produced.

[2] On the evolution of US and Russian views regarding this principle see Lewis Dunn and William Potter, "Time to Renew the Reagan-Gorbachev Principle," *Arms Control Today,* March 2020, pp. 18-23, https://www.armscontrol.org/act/2020-03/features/time-renew-reagan-gorbachev-.

The initial success of this approach was facilitated by a number of factors, including the starkly unequal relationship between the two countries, the desire by Moscow to demonstrate it was a credible partner with the United States, President Gorbachev's personal faith in the desirability of a world without nuclear weapons, the perceived cost savings from nuclear reductions, and the genuine concerns Presidents Bush and Yeltsin had about the nuclear dangers of the new political landscape in the post-Soviet space. Over time, however, the perceived political and economic benefits of the PNIs receded, while the absence of legally binding restraints made it much easier for Moscow to ignore its prior unilateral declarations and to resume deployments of previously restricted weapons systems. These deployments, while permissible, reflected a new Russian wariness of US military intentions, supreme confidence in the security of its tactical nuclear weapons, and little concern about the hypothetical risks related to their forward deployment and associated incentives for early use. More difficult to explain is the prolonged reluctance of the United States to press Russia over its departure from the PNIs and Washington's subsequent readiness to follow Russia's lead in ignoring the nuclear restraints it had previously put in place.

2. *The Risk of "Loose Nukes"*

The PNIs were not the only manifestation of US and Russian concerns about the security risks posed by Russia's sprawling nuclear weapons complex. As Matthew Bunn convincingly demonstrates in his chapter, beginning in 1991 and over the course of a more than a dozen years, the United States and Russia implemented a remarkably innovative nuclear threat reduction program informed by sometimes converging threat assessments and often overlapping interests. While the program was hampered, especially in its early years, by the tendency of the United States to treat Russia as the target of assistance rather than a full-fledged partner in threat reduction, the intense and extended period of collaboration fostered many close personal relationships among the implementers both at very senior policy levels and at working levels. These ties and the respect, understanding, and empathy that resulted from years of working together were instrumental in overcoming many technical and bureaucratic impediments on both sides. Over time, however, the impetus

for the program waned, especially as the Russian economy improved and significant headway was made in upgrading the security and safeguarding of Russia's nuclear assets. Although there are few indications that the end of the Cooperative Threat Reduction program was the result of a major shift in Russian or US assessments of the dangers of nuclear proliferation or use, there was probably a reordering of threat assessments in both countries. The dangers of "loose nukes" and "brain drain" were replaced by perceptions of bellicose behavior by the other, culminating in Russia's annexation of Crimea, US severance of nuclear energy cooperation, and Russian suspension of nearly all nuclear security collaboration.

3. ***Regional Concerns***

Despite their generally cooperative and sometimes coordinated approach to nonproliferation during much of the first 50 years after the entry into force of the NPT, Moscow and Washington often had different perceptions of the relative dangers posed by prospective proliferators in different regions. Thus, even when they chose to collaborate in trying to forestall South Africa's nuclear weapon program or to retard the nuclear weapon ambitions of Iran, India, Libya, North Korea, and Pakistan, the nuclear superpowers differed in their assessments of the risks these states represented, the urgency of forceful action, and the appropriate forms of intervention. Generally, it proved easier to engage in tacit cooperation through the adoption of stringent, parallel export control and safeguards policies than to forge multilateral diplomatic approaches or to rely on more forceful coordinated measures.

As Hanna Notte points out in her chapter, an important exception to this general tendency was US-Russian collaboration at the United Nations in 2010 in securing the adoption of UN Security Council Resolution 1929. This resolution noted Iran's failure to comply with previous Security Council resolutions concerning its nuclear program and imposed further restraints on the country's nuclear activities. As Notte argues, Russian support for further UN sanctions was driven by Iranian disregard for US diplomatic overtures, Tehran's failure to disclose possible military aspects of its nuclear program, and Russian concerns that Iranian intransigence might precipitate military escalation in the region. While agreeing to cooperate with Washington at

the United Nations over the Iranian nuclear file, Moscow also sought to limit the pressure that was applied on Tehran and to preserve its own special commercial and political interests in the country. In addition, it appears that Russia's readiness to find common nonproliferation ground with the United States with respect to Iran was influenced in part by broader US-Russian considerations, including the prospect for improved bilateral relations following the election of Barack Obama. In this sense, although neither side was prepared to acknowledge the operation of "linkage politics," there was recognition that constructive engagement over the issue of Iran's nuclear program might spill over into or yield dividends in other areas of mutual interest.

What Areas of US-Soviet and US-Russian Cooperation in the Past Offer the Greatest Prospect for Collaboration Today?

One of the findings from our earlier volume on US-Soviet cooperation for nonproliferation was that common ground usually was easier to find on purely technical issues, including those relating to the peaceful applications uses of nuclear energy. Although it is difficult in to separate fully the "technical" from the "political" in today's exceptionally frayed relationship between the United States and Russia, the existential threat posed by global climate change presents opportunities for collaboration in research and development relating to nonfossil fuels, especially nuclear energy. As Aubrey Means points out, an additional incentive for US-Russian cooperation—or at least coordination of policy—in this area would appear to be shared US and Russian interests in ensuring that the expansion of nuclear energy programs in non-nuclear-weapon states be undertaken in strict conformity with these states' NPT safeguards obligations.

A convergence of interests in avoiding two existential dangers—nuclear weapon use and catastrophic climate change—regrettably does not guarantee that decision makers will pursue policies consistent with the mitigation of these risks. As the chapters by Means and by Adam Stulberg and Jonathan Darsey indicate, the potential for cooperation in the promotion of peaceful nuclear energy also is complicated by the long history of competition for overseas nuclear markets, and there is little evidence that this competition will wane. Indeed, as Means observes, Russia has identified the export of

civilian nuclear technology as a key component of its strategy for economic growth. The benefits of greater interaction, and perhaps even partnerships, among nuclear scientists and industry experts from the two countries, could be substantial, particularly in the rapidly evolving field of small modular reactors. But it will be very challenging to subordinate short-term economic and political considerations to longer-term objectives—even if they involve a looming climate change catastrophe. Perhaps the most promising recent development in this regard is the enthusiasm expressed by both US and Russian government officials in devoting more attention at forthcoming NPT review process meetings to the third pillar of the NPT—that is, peaceful nuclear uses. It also is conceivable that the two countries may decide to address the issues of climate change and the nuclear power-nonproliferation nexus in the context of a revived or new version of the US-Russian Bilateral Presidential Commission. The original body, established in 2009 but suspended in 2014, included working groups on nuclear energy and nuclear security, energy and the environment, and arms control and international security; it would be well suited for joint consideration of growing existential threats.[3]

Another proliferation issue with a highly technical component on which the United States and Russia often have found common ground is the securing and disposal of large quantities of fissile material. In addition to the extraordinary cooperation carried out from 1991 to 2014 to improve security for nuclear weapons and weapon-usable material in Russia analyzed in Bunn's chapter, the two nuclear-weapon states have actively cooperated since the early 1990s on a variety of programs to minimize the use of highly enriched uranium (HEU) and to repatriate to Russia Soviet-origin HEU that could be found in many former Soviet republics and Eastern European states.[4]

Unlike the many US-Russia nonproliferation initiatives from the 1990s that have ceased, one HEU minimization program has persisted: the Russian

[3] See US Department of State, "U.S.-Russia Bilateral Presidential Commission," n.d., https://2009-2017.state.gov/p/eur/ci/rs/usrussiabilat/index.htm.

[4] Efforts to reduce the global footprint of HEU were not limited to the former Soviet Union and Eastern Europe. For a discussion of a number of these initiatives see William C. Potter and Christina Hansell, eds., *The Global Politics of Combating Nuclear Terrorism: A Supply-Side Approach* (New York: Routledge, 2010).

Research Reactor Fuel Return (RRRFR) program designed to eliminate HEU stockpiles associated with Soviet/Russian-supplied research reactors. As Noah Mayhew explains in his chapter, important factors contributing to its continuing success have been the centrality of technical cooperation among the parties, the elevated role of specialized government agencies and civil nuclear entities in its implementation, and financial dividends on the part of the recipient country. The program also benefited from the involvement of an impartial international organization (the International Atomic Energy Agency) and the fact that it was esoteric enough to avoid the political scrutiny that plagued the higher-profile cooperative threat reduction programs.

One of the difficulties in assessing the prospects for future US-Russian nonproliferation cooperation is that an empirical record of past behavior is underdeveloped. Most prognoses are impressionistic, selectively cite past episodes to buttress arguments, and conveniently ignore instances at odds with their interpretations. The chapter by Adam Stulberg and Jonathan Darsey is unusual in this respect, as it employs a structured and comparative empirical approach to examine US and Russian commercial nuclear export policy. Among its most significant findings is the largely positive picture it paints of parallel, complementary, and prudent nuclear exports—findings that mirror US-Soviet nuclear export behavior in much of the period following the Indian "peaceful nuclear explosion" in 1974.[5] More specifically, Stulberg and Darsey demonstrate that, although there are important differences in the character of US and Russian nuclear agreements with commercial partners, the two countries appear to have an implicit understanding of shared nonproliferation objectives that moderates what otherwise might be an unbridled commercial competition. This finding of convergent, tacit cooperation suggests the possibility for more targeted coordination of nuclear exports with nuclear aspirants who have, to date, been reluctant to accept enhanced safeguards.

[5] On this earlier period, see William C. Potter, "The origins of US-Soviet nonproliferation cooperation," in William C, Potter and Sarah Bidgood, eds., *Once and Future Partners: The United States, Russia and Nuclear Non-proliferation* (London: International Institute for Strategic Studies, 2018) pp. 23-54.

Revisiting the Past in Search of a More Cooperative Path Forward

The distant and more recent history of US-Soviet/Russian nuclear cooperation points to other opportunities for bilateral engagement that are also worth revisiting today. As described below, potential candidates include existing arms control and nonproliferation measures that have either been abandoned or allowed to languish, as well as mechanisms for reducing nuclear risk that could be usefully updated today.

Revitalizing US-Russia Cooperation on the CTBT

Although US President Bill Clinton famously described the CTBT as the "longest sought hardest fought prize in the history of arms control," the agreement has yet to enter into force a quarter century after its conclusion. The treaty will remain in limbo until the United States and seven other "holdout" Annex 2 states agree to ratify it. Despite opposition to the treaty from many Republican senators in Washington, seeing through the CTBT's entry into force is still very much in the interest of both the United States and Russia. Indeed, once in force, the CTBT would erect legal barriers to prevent both sides from resuming testing, which would limit their ability to develop new, and potentially more destabilizing, types of nuclear weapons.

On the basis of this shared interest, policy makers in Washington and Moscow should consider cooperative approaches aimed at strengthening support for the CTBT among international and US domestic audiences. Among the most basic steps they could take in this regard would be to issue a joint statement, in conjunction with the other NPT nuclear-weapon states, reaffirming their shared support for the CTBT and a halt to all nuclear testing in the interim before the treaty enters into force. In so doing, the five NPT-recognized nuclear-weapon states could also reiterate their shared understanding that the CTBT is a "zero yield" treaty, meaning that it prohibits extremely low-yield hydronuclear experiments. This step, while modest, would go a long way toward shoring up the norm against nuclear testing, which eroded under the previous US administration.

In line with the point made earlier that nonproliferation cooperation is often easier on issues that are more technical in nature, the United States and Russia could also usefully consider resuming lab-to-lab cooperation on nuclear test monitoring. In so doing, they could draw upon the areas for cooperation outlined in 1993 in Presidential Decision Directive 47, "Nuclear Scientific and Technical Cooperation with Russia Related to Stockpile Safety and Security and Comprehensive Test Ban Treaty (CTBT) Monitoring and Verification."[6] Considering that all cooperative activities between the US Department of Energy and Russia's Rosatom were suspended following the annexation of Crimea, however, this proposal would require significantly more political will to implement than the joint statement identified above. Nevertheless, if successful, these efforts could potentially help reassure domestic policy makers in the United States that the treaty is indeed verifiable—while paving the way for the resumption of technical cooperation in other nonproliferation areas.[7]

Renewing Engagement on the JCPOA

Another area where US-Russia cooperation could usefully be revived is in the context of the Joint Comprehensive Plan of Action (JCPOA). At the time of its conclusion in July 2015, many observers held up the JCPOA as evidence that the United States and Russia could still successfully cooperate on nonproliferation issues despite the deepening crisis in their bilateral relationship. In May 2018, however, the Trump administration abrogated the agreement, prompting Tehran to gradually roll back compliance with its terms and increase its breakout potential. Although the Biden administration has sought to rejoin the accord—albeit in a "longer and stronger" form—these efforts have been met with opposition from Republican lawmakers, who advocate instead for pressuring Iran to give up its nuclear ambitions with harsh economic sanctions.

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[6] White House, Presidential Decision Directive/NSC 47, "Nuclear Scientific and Technical Cooperation with Russia Related to Stockpile Safety and Security and Comprehensive Test Ban Treaty (CTBT) Monitoring and Verification," March 21, 1996, https://clinton.presidentiallibraries.us/items/show/12757.

[7] These and other areas for US-Russia cooperation on the CTBT are described in Sarah Bidgood, "US-Russia relations and the future of arms control: How the Comprehensive Nuclear Test-Ban Treaty could restore engagement on nuclear issues," *Nonproliferation Review,* Vol. 25, Nos. 3-4 (2018), pp. 307-318.

If it does prove politically possible for the United States to rejoin the deal, coordination between Washington and Moscow will be essential to bringing Iran back into compliance with its provisions. This outcome would appear to be in both the Russian and the US interest given the likely proliferation consequences in the Middle East if Iran were to acquire a nuclear weapon. As Hanna Notte and Hamidreza Azizi have noted elsewhere, however, Russia is unlikely to support any efforts on the part of the Biden administration to expand the terms of the agreement beyond those negotiated in 2015.[8] Recognizing the importance of having each other's support for these negotiations, policy makers in Washington and Moscow should coordinate closely to ensure that they understand clearly each other's positions and red lines.

Strengthening and Revitalizing Nuclear Risk Reduction

As described earlier in this chapter, the United States and Soviet Union concluded a host of bilateral risk reduction and confidence-building measures during the height of the Cold War that were aimed at preventing nuclear use as a result of escalation, miscalculation, or accident. Many of these agreements, while still in force, have either been forgotten or rendered less relevant by technological developments and changes in the post-Cold War security environment. In an era of heightened nuclear risk, the United States and Russia should revisit these past agreements, update them where necessary—including the aspects dealing with the physical infrastructure needed for implementation—and recommit to their provisions. While some of these accords served primarily to codify "rules of the road" at the time they were negotiated, they remain important, as they contribute a much-needed degree of predictability to the US-Russian relationship today by reestablishing agreed principles and providing imperatives for consultation.[9]

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[8] Hanna Notte and Hamidreza Azizi, "Where Are Russia's Red Lines on Iran's Nuclear Brinkmanship?" Carnegie Moscow Center, February 19, 2021, https://carnegie.ru/commentary/83915.

[9] Some examples are the 1971 Agreement on Measures to Reduce the Outbreak of Nuclear War, the 1972 Agreement on Basic Principles of Relations Between the United State and the Union of Soviet Socialist Republics, and the 1973 Agreement on the Prevention of Nuclear War.

Beyond these existing measures, the historical record also points to numerous other efforts to reduce the risk of nuclear conflict between the United States and Soviet Union/Russia that, for various reasons, were either never concluded or not implemented. These earlier ideas should be compiled and reviewed to determine if and how they could be usefully taken forward today. A priority in this regard should be revisiting the Joint Data Exchange Center, which was first endorsed in 1998 by Presidents Bill Clinton and Boris Yeltsin and subsequently signed as a memorandum of understanding by Presidents Clinton and Vladimir Putin in 2002 but remains unrealized.[10] This initiative deserves renewed attention now, as eroding trust and the deployment of potentially destabilizing new strategic delivery systems make accidental nuclear use more likely.[11]

Reviving "Space Bridges" as a Tool for Citizen Diplomacy between the US and Russia

Between 1984 and 1987, US and Soviet citizens were afforded new insights into one another's views on the most pressing issues of the day through a series of "space bridges," or telemosti. These events—the best known of which were jointly hosted by veteran journalists Vladimir Pozner and Phil Donahue—brought together live television audiences in both countries for discussions on topics ranging from space exploration to gender issues to World War II. While initially envisioned as a way to help participants from both countries overcome their fears of each other, the space bridges had more profound and far-reaching societal impacts. Indeed, as Helene Keyssar reports, they prompted Soviet and American participants to reflect critically on their "own values and behaviors," contributing to what she describes as a transformation of their perceptions of one another "almost beyond recognition."[12]

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[10] The center was inspired by the successful operation during the millennium rollover of the temporary joint Center for Year 2000 Strategic Stability in Colorado Springs.

[11] This recommendation is also put forward in a recent report, National Academy of Sciences in collaboration with Russian Academy of Sciences, *Regional Ballistic Missile Defense in the Context of Strategic Stability* (Washington, DC: National Academies Press, 2021), p. 83.

[12] Helene Keyssar, "Space Bridges: The U.S.-Soviet Space Bridge Resource Center," *PS: Political Science and Politics,* Vol. 27, No. 2 (1994), p. 250.

While space bridges themselves have no intrinsic relationship with nonproliferation cooperation, they can serve as a means through which to develop one of its most essential criteria for success: empathy. Further, they offer opportunities for individuals from the United States and Russia to build personal relationships which, at the practitioner level, are among the main drivers behind successful nonproliferation cooperation. On this basis, it is worth exploring whether the telebridge model could be successfully revived and adapted for new media platforms today—and with a focus on nuclear issues. The results could lead to a more nuanced national discourse on US-Russia security considerations that focuses less on areas of divergence and more on shared priorities.

Building Trust One Step at a Time

Despite the logic of cooperating in the areas of mutual interest described above, the lack of trust in the US-Russia relationship today will no doubt prove a major barrier to constructive engagement. Indeed, while it is necessary for leaders to attach great importance to shared nonproliferation objectives for joint work to occur, as we have noted in our previous volume, this condition alone is not sufficient for cooperation to proceed. Under these circumstances, it is worth recalling strategies used by US and Soviet leaders in the past to extricate themselves from a worsening security dilemma and to initiate collaboration in mitigating existential nuclear threats. One effective strategy historically has been "Graduated Reciprocation in Tension reduction" (GRIT), an approach developed by cognitive psychologist Charles E. Osgood in the late 1950s to build trust through unilateral, reciprocal acts of restraint.[13]

Writing against the backdrop of a burgeoning arms race and a brewing crisis in Berlin, Osgood observed that disarmament progress was all but impossible during moments of high tension in the US-Soviet relationship. By halting this "tension-arms race spiral" through "unilateral acts of a tension reducing nature," he theorized, mutual perceived threats could be "reduced to a

13 See Charles Osgood, "Suggestions for Winning the Real War with Communism," *Journal of Conflict Resolution,* Vol. 3, No. 4 (1959), pp. 295-325, and Charles Osgood, *An Alternative to War or Surrender* (Champaign, IL: University of Illinois Press, 1962).

level where the arms race [could] be halted and put in reverse."[14] Osgood's approach was employed to good effect by President John F. Kennedy, who announced a unilateral test moratorium in 1963, which led to a breakthrough in negotiations on a nuclear test ban treaty.[15] Decades later, in the immediate post-Soviet period, President George H. W. Bush used a GRIT-like approach in the Presidential Nuclear Initiatives, which Faust's chapter in this volume analyzes. Some scholars also contend that Gorbachev's unilateral reduction of Soviet conventional forces in 1988 was part of a GRIT strategy, although they disagree over its impact. Together, these historical antecedents suggest that GRIT can serve as a catalyst today for bilateral cooperation on nuclear issues, including nonproliferation.[16]

The Need for Greater Civility, Respect, Empathy, and Introspection

The chapters in this volume have illustrated how the United States and Russia were able to find common ground on a variety of challenging proliferation issues, even during periods of considerable bilateral tension. To some extent, collaboration was the continuation of past practice in a policy sphere in which both parties recognized shared national interests. Objectively, many of those interests remain complementary. What has changed most dramatically in recent years is the process of diplomatic intercourse, including a dramatic increase in uncivil exchanges in international negotiating forums, the disappearance of any vestiges of respect for or interest in the other side's perspectives, a failure of imagination—especially with respect to an ability to understand how the world may look from the vantage point of the other party—and a tendency to uncritically assume the virtue of one's own position without a sustained effort to probe fundamental assumptions or to consider the possibility that

14 Charles Osgood, "A Case for Graduated Unilateral Disengagement," *Bulletin of the Atomic Scientists,* Vol. 16, No. 4 (1960), p. 130.

15 As one of the authors (Bidgood) has noted elsewhere, Kennedy was aware of Osgood's work, and two copies of Osgood's book, *An Alternative to War or Surrender,* appear among the president's papers. Further, between 1964 and 1971, Osgood served on the Arms Control and Disarmament Agency's Social Science Advisory Board. See Bidgood, "Just GRIT and Bear It: A Cold War Approach to Future US-Russia Arms Control," *International Spectator,* Vol. 56, No. 1 (2021), p. 4, notes 2 and 3.

16 This argument builds upon one put forward in Bidgood, "Just GRIT and Bear It."

both sides may bear major responsibilities for the current impasse in the nuclear, and broader, bilateral relationship.

There is no simple way out of this predicament, but a starting point is recognition of the sources of the problem and an understanding of the stakes both sides have in its successful resolution. Robert Legvold has emphasized the importance of introspection in this process, including the need to think carefully about where one wants the relationship to be going in all of the key issue areas such as nuclear arms control and nonproliferation.[17] We share his hope that if the United States and Russia "can move forward with even small steps…the picture may be more positive than it currently appears."[18]

[17] See Hanna Notte, "The University Consortium Interview Series: Prof. Robert Legvold," [April 2021], https://uc.web.ox.ac.uk/article/the-uc-interview-series-robert-legvold.
[18] Notte, "University Consortium Interview Series."

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"Today, at a time of contentious U.S.-Russian relations and uncertainty about the future of global nonproliferation efforts, it is useful to recall that the Cold War rivals were often partners in strengthening the nonproliferation regime. Few if any current proliferation challenges can be effectively addressed without a resumption of their cooperation. In this valuable and timely volume, Potter and Bidgood and their contributing authors examine lessons from past U.S.-Russian collaborations and make practical recommendations for how those lessons could be applied in the period ahead."

—Robert Einhorn

Senior Fellow, Brookings Institution, and former Assistant Secretary of State for Nonproliferation

"US-Russian bilateral relations are at an historical low point, negatively affecting the global security architecture. It is hugely important, therefore, to find ways to restore cooperation in areas that serve both country's interests. This timely new volume does so with respect to nuclear nonproliferation. Seven thoroughly researched case studies demonstrate that overcoming US-Russian differences is both possible and necessary. The volume's findings are a "must read" for US and Russian policy makers and others interested in finding light at the end of the nuclear nonproliferation tunnel."

—Vladimir Orlov

Founding Director of the PIR Center, Moscow