

## Epilogue

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*Doomed to Cooperate* captures the critical contribution that cooperation between scientists and engineers from the US and Russian nuclear weapons laboratories made in addressing the nuclear dangers resulting from the break-up of the Soviet Union. Today, nearly 25 years later, none of the West's fears about the Russian nuclear complex came to pass—no disaster in the complex, no serious nuclear accidents, only minimal loss of nuclear material, limited leakage of nuclear weapons know-how or brain drain, and no nuclear weapons stolen, sold, or diverted. Continued nuclear cooperation is required to sustain these gains and to confront the potential spread of nuclear weapons to additional states or non-state actors and terrorist organizations, yet Washington and Moscow appear to hold such cooperation hostage to their current political differences.

As the Cold War ended, Washington and Moscow took historic steps to move from confrontation to collaboration. Direct collaboration between Russian and US nuclear scientists and engineers, what we call lab-to-lab cooperation, was especially crucial to address the nuclear dangers of the post-Cold War world. Before this turning point, the greatest nuclear risk was a potential nuclear confrontation between our countries. Managing that risk was in the hands of the heads of state. With the complex risk environment resulting from the break-up of the Soviet Union, assuring the safety of nuclear weapons and managing the risks of the potential theft or diversion of nuclear assets required more than the country's leadership. It became essential to enlist the leadership of the nuclear institutions as well as the individual workers to help tackle this herculean task.

In other words, the nuclear experts themselves became part of the first line of defense in averting a nuclear catastrophe. At the time, these individuals understood better than anyone the gravity and the urgency of the dangers and what was required to contain them. Directly involving these key individuals on both sides was the defining feature of lab-to-lab cooperation. Not only were these dangers managed effectively and without compromise of either side's national security information, but the scientific community on each side also built a reservoir of trust and good will that can serve the future needs of both countries.

Seventy years of living with the bomb should have taught the entire world that nuclear is different. Splitting nuclei, which occurs in bombs and in nuclear reactors, releases energy that is a million-fold greater than the energy released in all other forms of explosives or energy-generating devices. The devastation wrought by the two atomic bombs in Japan in 1945 was so horrific that neither atomic bombs nor their more powerful kin, hydrogen bombs, have been used in anger since. Likewise, nuclear power plants are such efficient producers of electricity that a mere 400 nuclear power plants

around the world have supplied nearly 15 percent of the world's electricity with minimal carbon production in the past couple of decades. However, the nuclear accidents at Three Mile Island, Chernobyl, and Fukushima are grim reminders that nuclear safety is a never-ending quest for the international community. Preventing the use of nuclear weapons and supplying safe and secure nuclear electricity require cooperation on both state and technical levels, not isolation.

Nevertheless, Washington and Moscow have suspended most nuclear cooperation and isolated their nuclear scientists because of current political differences. Since the beginning of the Ukraine crisis in February 2014, both governments have refused to authorize meetings between their nuclear weapons scientists and have not allowed them to attend each other's conferences. Washington's response to the crisis has been to impose sanctions on Russia and to demonstrate that it will not be business as usual in dealing with Moscow. Whereas Washington has expressed willingness to continue joint security collaboration, it has withheld approval for science and nuclear energy cooperation. Moscow, on the other hand, is no longer interested in security cooperation focused on its own nuclear complex but welcomes continued scientific collaboration and promotion of civilian nuclear energy. Washington appears to treat scientific and nuclear energy collaboration as a favor or concession to Moscow, which, in turn, views security cooperation to be the same for Washington. Neither acknowledges that these are necessities for both. This stalemate has shut down lab-to-lab cooperation, which had already waned in the past decade because of similarly differing priorities for cooperation.

Lab-to-lab cooperation promoted both the pursuit of science, including nuclear energy technologies, and improvements in nuclear security in the early 1990s. Scientific cooperation tapped into the most basic interests of scientists on both sides, namely, to create new knowledge and new technologies. Science is fundamentally an interactive, cooperative pursuit, which requires exposing results to review, critique, and ultimately improvement by others. The common language of science allowed us to more easily cross cultures and borders. As the articles in this book demonstrate, the expertise and facilities of the two sides proved enormously synergistic, resulting in remarkable progress in several areas of science, which neither side could have produced alone or at least not for some time to come. We found science, unlike politics, to be a unifying force—one that allowed us to build trust through early scientific collaborations.

Allowing the nuclear weapons scientists to move out of the shadow of Cold War secrecy through scientific collaborations and the trust built by working together had a powerful impact on enhancing nuclear security. For the nuclear weapons scientists, the progression from science to security was a natural evolution since we had practiced both from the beginning of our nation's nuclear programs. Scientific collaboration made us realize how much we were alike. We found each other to be equally loyal and patriotic toward our countries and dedicated to the protection and defense of our nations. These interactions allowed us to overcome the natural suspicions engendered by Cold War competition. Through lab-to-lab interactions, each side gained confidence in the safety and security of their respective nuclear stockpiles. In turn, this bilateral confidence reassured a nervous world.

Unfortunately, as the two governments appear to be returning to confrontation, these productive relations developed over 25 years are threatened. Many in the United States now ask if nuclear cooperation over the past 25 years was in the country's best interest. Would it not have been better in the 1990s to leave Russia to deal with its economic misfortune and deteriorating nuclear complex alone? My answer is a resounding, "No!" The situation in the Russian nuclear complex in the 1990s was the most dangerous in nuclear history. Although the likelihood of a nuclear confrontation between our countries declined dramatically, the potential use of a nuclear weapon somewhere in the world increased because of the possibility of the theft or diversion of nuclear weapons or nuclear materials and the potential proliferation of nuclear weapons expertise from an economically stressed Russian nuclear complex.

The sharply different views Washington and Moscow have today of a new world order and how to respond to current international crises imperil nuclear cooperation. However, as former US Secretary of State Henry Kissinger pointed out recently at the annual Evgeny Primakov lecture in Moscow, confrontation is not inevitable. He framed the dilemma facing the two nations as follows: "In this way, paradoxically, we find ourselves confronting anew an essentially philosophical problem. How does the United States work together with Russia, a country which does not share all its values but is an indispensable component of the international order? How does Russia exercise its security interests without raising alarms around its periphery and accumulating adversaries? Can Russia gain a respected place in global affairs with which the United States is comfortable? Can the United States pursue its values without being perceived as threatening to impose them?"<sup>1</sup>

These questions and how they are to be resolved must address a long list of national security grievances by each side. Moscow cites actions by Washington that threaten its security and undermine strategic stability—such as NATO expansion, withdrawal from the anti-ballistic missile treaty, indiscriminate use of military force around the world, development of precision global strike munitions, and attempts to dominate the space and cyber domains.<sup>2</sup> Partially in response to these concerns, Russia has not only increased its reliance on nuclear weapons for its security during the past decade, but it has also adopted a much more aggressive nuclear doctrine. These developments rightfully raise serious concerns in Washington and in Europe because they are viewed as lowering the nuclear threshold and as Moscow's attempt to create space for the freedom of action it apparently wishes to exercise in its near abroad, including Eastern Europe.

There is much talk on both sides of a return to an arms race, which makes no sense if one looks beyond today's grievances at the bigger picture. A renewed arms race is dangerous and unaffordable for both sides. It is time to review concerns and issues of global stability to reflect the political and technical changes of the past few decades. For example, Russia wants strategic stability examined in light of the new developments in

<sup>1</sup> Henry A. Kissinger, "Kissinger's Vision for U.S.-Russia Relations," *The National Interest* (February 4, 2016). <http://nationalinterest.org/feature/kissingers-vision-us-russia-relations-15111>.

<sup>2</sup> These have been a common theme of President Vladimir Putin's complaints about the US, starting with 2007 Munich speech. "Putin's Prepared Remarks at 43rd Munich Conference on Security Policy in 2007," Courtesy Munich Conference on Security Policy, *The Washington Post*, February 12, 2007. <http://www.washingtonpost.com/wp-dyn/content/article/2007/02/12/AR2007021200555.html>.

missile defense, advanced conventional weapons, space, and cyberspace. The United States wants to continue to pursue an arms reduction agenda and have Russia re-evaluate the role of tactical nuclear weapons.

The current political acrimony prevents Russia and the United States from confronting the greater dangers that threaten the security of the world today, those that arise from failed states and the disintegration of state power, which require cooperation by the major powers. Moreover, it takes attention away from collaborating on other serious issues that threaten mankind's existence and which require scientific cooperation, such as global climate change; a sustainable supply of clean, affordable energy that includes nuclear fission and fusion; and the protection of the earth from catastrophic asteroid impacts.

Whereas these larger issues will take time to resolve and get our two countries back on track to a sensible future, the nuclear issues cannot wait. Our governments must again find common ground to promote nuclear cooperation as they did at the end of the Cold War. Their cooperation for the Iran deal offers hope. The development and the implementation of the Joint Comprehensive Plan of Action<sup>3</sup> would not have been possible without close cooperation between Russia and the United States. The two nations put aside political differences in the interest of nuclear cooperation that benefits both sides.

Washington and Moscow should do the same to sustain the enormous improvements in nuclear safety and security of Russia's nuclear complex and the corollary benefits accrued in the US complex as a result of lab-to-lab cooperation. The authors in *Doomed to Cooperate* overwhelmingly call for continued scientific and technical cooperation because ensuring nuclear safety and security, be it for weapons, nuclear facilities, or nuclear power, requires continued vigilance, cooperation, and exchange of best practices and lessons learned. These efforts necessitate close collaboration between the stewards of nuclear weapons and materials, which was the hallmark of lab-to-lab cooperation.

In this book, the nuclear weapons scientists on both sides also make a convincing case that their knowledge and continued technical cooperation could play a vital role to prevent the proliferation of nuclear weapons to states or terrorist organizations. Likewise, pooling their expertise will be essential in responding to nuclear threats or nuclear accidents as well as achieving the maximum benefit from civilian nuclear power worldwide.

Fortunately the requisite talent still exists at the Russian and US nuclear labs today. The reservoir of good will accumulated over the past 25 years still exists, but it must be nurtured. Formal intergovernmental agreements signed in the past five years, but not exercised, provide the necessary legal foundation. What is needed now is for our governments to encourage and task the laboratories to jointly address these problems to the benefit of each nation and the world.

<sup>3</sup> UN Security Council, *Security Council resolution 2231 (2015) [on Joint Comprehensive Plan of Action (JCPOA) on the Islamic Republic of Iran's nuclear programme]*, July 20, 2015.