

BOOK REVIEW

Review of *Doomed to Cooperate: How American and Russian Scientists Joined Forces to Avert Some of the Greatest Post-Cold War Nuclear Dangers*, edited by Siegfried S. Hecker. 976 pages, \$80. See the published version in *The Nonproliferation Review* at <http://tandfonline.com/doi/full/10.1080/10736700.2017.1321226>

People preventing catastrophe

By Andy Weber and Christine Parthemore

In the final chapters of the first volume of his massive new history of US-Russian nuclear cooperation, Siegfried S. (Sig) Hecker recounts a comment made to him by Rady I. Ilkaev, first scientific deputy at one of Russia's experimental physics laboratories, over a 1997 dinner in the formerly closed nuclear city of Sarov. "Sig," Ilkaev said, "I guess you are not going to rest until you have recovered every atom of plutonium around the world."

The two men were discussing the nuclear materials remaining at the Semipalatinsk site in Kazakhstan long after the Soviets had ended nuclear testing there. The Russians showed little concern at the time of the dinner in Sarov, but eventually Hecker swayed them. He went on to spearhead projects to prevent scavengers from accessing nuclear materials at Semipalatinsk, created new models of cooperation for reducing WMD threats, and changed the course of history for US-Russian relations.

Today, tensions between these two countries are reaching heights more common to the Cold War era. *Doomed to Cooperate: How American and Russian Scientists Joined Forces to Avert Some of the Greatest Post-Cold War Nuclear Dangers* could not have come at a better time, precisely when the status quo offers so little hope. The legions of American and Russian contributors to this volume who have participated in lab-to-lab cooperation and other WMD threat-reduction projects allow their readers to think past today's malaise. Their stories provide ample inspiration to begin developing new ideas for bilateral scientific and technical collaboration, arms-control concepts, joint nuclear safety and security work with third countries, and other positive ventures that the United States and Russia could explore together. "Lab-to-lab cooperation began in February 1992," Hecker writes in the preface, "less than two months after the breakup of the Soviet Union." *Doomed to Cooperate* chronicles how quickly things can change: US and Russian nuclear personnel "were able to accomplish so much in an environment that only a few years prior was confrontational and shrouded in secrecy." Opportunities to reduce WMD threats can coalesce quickly when we are prepared to find them through the fog of current events.

In nine chapters and nearly 1,000 pages over two volumes, Hecker and a few dozen contributors recount their experiences in reducing the nuclear risks of the post-Cold War era. Their case studies cover a wide range of activities across more than two decades: the Joint

Verification Experiment in 1988; warhead safety and security exchanges; nuclear materials protection, control, and accounting collaboration; trilateral cooperation among the two countries and Kazakhstan; programs to bring jobs and commercial investment to previously closed nuclear cities; and much more. In this review, we focus on some of the most important contributions *Doomed to Cooperate* makes to our understanding of US-Russian nuclear relations, and to the field of countering WMD threats.

The people

Sig Hecker, the director of Los Alamos National Laboratory from 1986 until 1997, seized the moment as the Soviet Union was collapsing. Perhaps his lifelong involvement in creating an ever-more-fearsome US nuclear arsenal gave him a gut-level appreciation of the dangers of loose weapons and materials. He quickly became a champion of working with former Soviet nuclear weaponeers, peer-to-peer, to prevent catastrophe. In the process, Hecker pioneered an innovative approach to national and global security that put the people—the custodians of WMD—in the forefront. This process enabled cooperation where it mattered most: at the source. Most of the sites described in these volumes are remote, and the many participants in this history travelled millions of miles by planes, trains, and automobiles to engage in vital work far from government office buildings in Moscow or Washington.

One of us (Weber) worked intensively with Sig on a secret, seventeen-year trilateral Kazakhstani-American-Russian project to secure hundreds of kilograms of vulnerable plutonium in the Degelen Mountain area of the Semipalatinsk Nuclear Weapons Test Site. His zealous focus on building networks of like-minded leaders to make the world safer, bureaucrats be damned, was a marvel to watch and an honor to join. The personal stories in *Doomed to Cooperate* show the true power of cooperative threat reduction programs when multinational participants act together and inspire others to thwart WMD dangers.

One important phenomenon that the books reveal is the enthusiasm of those who had built the weapons for destroying them under their protection. Hecker recounts from an early visit that Russian nuclear-weapon scientists seemed protective of their weapons and wanted to retain tight control over the process of decommissioning and destruction. One told him, “Only those who built them should dismantle them.” Former US Deputy Secretary of Energy Charlie Curtis also describes the feelings of the Russian nuclear experts: “Just as they truly believed the arsenals they had raced to build had prevented a catastrophic war, they believed they were now fated to join in a race to protect these arsenals and the associated fissile materials, to keep them from falling into the wrong hands and to prevent a catastrophe of unimaginable consequence.”

We cannot overstate how encouraging this phenomenon is, nor how important it is for preparing future WMD security and elimination projects. Perhaps our own most memorable experience was a February 2014 visit to the remote desert outpost of Ruwagha, Libya, where the Organisation for the Prohibition of Chemical Weapons, the United States, Germany, Sweden, and Canada were assisting the Libyans in ridding the world of the final remnants of

Muammar Qaddafi's chemical-weapon stockpiles. Under beautiful blue skies, the on-site team and guests shared a cake shaped like an artillery shell with the number 517 in icing on top and a second cake shaped like a 500-pound bomb with an icing number 8, to celebrate the quantities of each weapon type that the Libyans had destroyed. We will never forget the commitment, pride, and joy on the faces of some of those present who had helped build Libya's chemical weapons and who now had worked so hard to ensure they would never be used.

Another persistent theme in Hecker's volumes is the common experience of US implementers of national-security projects in outpacing interagency decision making in Washington. In case after case, the lab directors, scientists, and other experts who would conduct cooperative nuclear work with Russia created opportunities faster than those in federal office buildings could (or would) approve them.

This is a healthy tension in the system, but the numerous examples in these books demonstrate that it is crucial to have strong champions in Washington who understand the importance of international counter-WMD cooperation programs. The authors credit a number of people who knew the value of lab-to-lab cooperation, and who understood that this work could be a key to building trust with Russians and promoting stability. Without officials such as James Baker, Charlie Curtis, Rose Gottemoeller, Ernie Moniz, and others to green-light new projects, grant funds, fight for nuclear threat reduction programs on Capitol Hill, and develop their own relationships with their counterparts in Moscow, many of the successes outlined in *Doomed to Cooperate* might not have happened.⁽¹⁾ How to grow a new generation of champions in the footsteps of these past leaders is a serious challenge facing Washington today.

This requirement will be even more important for future, more difficult cases. The US-Russian collaboration described by Hecker and his colleagues faced serious challenges, to be sure, but many contributors for *Doomed to Cooperate* note that they benefitted from the comparable skills and experiences of the Russian and US scientists. This was the secret to many successes in lab-to-lab cooperation.

In the introductory chapter, Hecker describes the Russian staff, despite some shortcomings, as outstanding: "their computational achievements were remarkable, and their experimental facilities were innovative and functional." The contributing authors echo this theme throughout both volumes. This relative parity is not present in some of the countries with which the United States now seeks to cooperate in stemming WMD threats. In recent years, the United States has expanded science and technology exchanges, the 1994 Nunn-Lugar Cooperative Threat Reduction program, and other activities to reduce WMD risks. Under the Barack Obama presidency, for example, the Department of Defense worked to expand bilateral scientific collaboration in support of its "rebalance to Asia." This has led to new pressure to justify to both executive branch staff and Congress exactly how the United States benefits from science and technology cooperation with countries whose capacities differ from ours.

Though *Doomed* does not address this question directly, its case studies hint at a partial answer. Leaders in the labs and in Washington ensured that participants kept their eyes on the

grand prize: contributing to bilateral relations and building trust where little existed. All the authors seem to have developed a deep appreciation for the critical role that personal relationships play in national-security endeavors.

Finally, *Doomed to Cooperate* shows the importance of heads of government in advancing arms control and nonproliferation. While the scientists' struggles against bureaucratic inertia form a strong undercurrent of the book, their stories also show that smart presidential actions can drive rapid progress. After months of considering the future of US-Russian cooperation in the late 1980s and early 1990s, the process of determining next steps was accelerated in the fall of 1991 when President George H.W. Bush launched his Presidential Nuclear Initiatives. His Soviet counterpart, Mikhail Gorbachev, welcomed and reciprocated the move. These bold steps pushed their respective bureaucracies into high gear. Many of the most magical moments in the cases Hecker presents stem from when US and Russian leaders approved historical arms-control agreements and missions to reduce proliferation risks, and the implementation of these presidential visions allowed the lab personnel from both countries to shine.

The programs

In one such case, in what we now know were the final years of the Cold War, Presidents Ronald Reagan and Gorbachev led both governments into the new era of bilateral nuclear cooperation. After technical and diplomatic planning discussions, the Joint Verification Experiment (JVE) launched a new era by bringing US and Soviet arms-control inspectors into one another's nuclear sites for the first time. This initial project paved the way for the dozens of bilateral nuclear cooperation programs captured in *Doomed to Cooperate*.

The JVE proved to be revolutionary: experts from the Soviet Union were allowed into the Nevada Test Site to join in witnessing and jointly monitoring a US nuclear test, and American experts would then reciprocate for a Soviet test at the Semipalatinsk Test Site. The tests, conducted in 1988, were followed by exchanges among the directors of the relevant labs. The goals of the JVE included developing agreed verification methods and protocols for both countries to gain confidence in each other's adherence to the bilateral Threshold Test Ban Treaty and the Peaceful Nuclear Explosions Treaty, both signed in the 1970s. As the authors who document the JVE show, the experiment exceeded expectations and revealed the power of personal relationships.

Many chapters in *Doomed to Cooperate* focus on conversion activities—usually to divert military facilities and personnel to civilian commercial activities to earn money while leveraging already-built capacities—and other programs designed to keep Russian nuclear scientists and technicians gainfully employed. The goal was to mitigate the risk that they might be wooed to help Iran or other countries develop nuclear capabilities. This was a significant concern as the Soviet Union broke apart, but one which, in hindsight, many of the book's contributors think was overblown.

The studies of conversion activities in these volumes are invaluable for several reasons. The first is the conclusion that conversion of WMD programs has often failed or seen mixed success, yet remains appealing to those who wish to avoid the costs and political difficulties of alternative WMD security, removal, and elimination solutions.

Second, most of the case studies on defense conversion provide detailed accounts of why specific projects worked, failed, succeeded and then floundered, or saw partial success. These writings should be studied before crafting any comparable future programs. Indeed, the cases in *Doomed to Cooperate* provide enough variety to allow readers to find trends in factors that help or hinder progress. For example, comparing the conversion attempts in Kazakhstan that we have worked on and studied with cases presented in these two books, we see a common challenge for facilities that had been built in remote, hard-to-reach locations in order to hide or isolate WMD activities. If these sites are converted to commercial purposes, they will tend to face costly logistical challenges that reduce their competitiveness.

As Hecker concludes, the US-Russian conversion work was valuable not for creating so many jobs or billions in commercial revenue, but in the personal relationships these efforts allowed to develop among the scientists involved. The transparency and understanding fostered by participants helped both countries to reduce mistrust and anxiety in the post-Soviet era.

Models such as the International Science and Technology Center (ISTC) and the extensive scientific collaboration detailed in the second volume of *Doomed to Cooperate* may have more enduring legacies. In his summary of the activities focused on reducing fears of “brain drain,” Hecker cites three Russian counterparts as having described the ISTC as a “model program ... They said it was virtually corruption proof because of the direct payment of salaries to the individual scientists—good scientific results and no financial abuses.” The fact that the ISTC is still going, has expanded to include multinational participation, and found a new home in Kazakhstan after Russia ended its tenure as host, are all signs of its enduring utility.

Scientific exchanges not purely focused on commercialization may likewise be more appropriate for reducing future proliferation threats. The nature of some modern proliferation risks will require new ways of setting norms among scientists, promoting a safety and security culture, ensuring personnel reliability, and other issues covered in Russian and American lab exchanges. Beyond these specific topics, the contributors show that both trust and unexpected scientific value can grow from working through the divergent ways that scientists from different countries perceive the information, methods, and challenges they explore together. This process may have even higher utility in cooperation among partners with disparities in scientific skills and training.

The practical

In his chapter on the JVE, Ambassador C. Paul Robinson reveals a subplot that may only be humorous to those who have worked on such minutiae. In a historic moment on the final day of May 1988, Secretary of State George Shultz and Foreign Minister Eduard Shevardnadze

met in Moscow to sign the agreement to launch the JVE. While many similar ceremonies require dignitaries ink their names to a single page or a short document, Robinson notes that Shevardnadze and Schultz had to sign a pile of paperwork “nearly 3 inches thick.” The JVE agreement included an extensive list of the equipment that each country would need to bring into the territory of the other for verification activities, as well as “very detailed guarantees to ensure the safety and personal security of the inspectors and participants,” given the pervasive distrust of the time.

These kinds of details in the book may sound outright dull to some readers. And indeed, “contracts” may be one of the most common terms in the *Doomed to Cooperate* volumes. But in our eyes, the five months that technical and programmatic experts spent producing thick lists of gear and figuring out how to navigate secrecy and export controls to use the necessary equipment in a country that had been until quite recently an adversary represents a remarkable achievement, without which the JVE would not have happened.

A welcome lesson of *Doomed to Cooperate* is how world-shaping activities can be dominated by practical, seemingly mundane details. In projects to address WMD threats, a type of magic can come from focusing on the practical matters—which tools are needed for given projects, who has them, and how to get them where they are needed. Working through lists of gear and comparing equipment with foreign counterparts is a tried-and-true mechanism for pulling through political tension and finding common ground. Indeed, one entire section by Yuri Churikov on nuclear materials protection, control, and accounting cooperation reads as one long equipment list.

Russia and the United States learned this lesson again from 2012 to 2013 as an avenue for discussing the looming threat of Syria’s chemical weapons. Our staff and colleagues developed an extensive list of the equipment and capabilities that would be needed if the opportunity arose to destroy these WMD. The act of jointly working through this document, dubbed the “universal matrix,” contributed to the diplomatic breakthrough that allowed the international community to remove and destroy more than 1,000 tons of Syrian chemical weapons and precursors.⁽²⁾ This process transformed the impossible into the feasible, and that feasible plan, represented by a long list of gear, rapidly became the most politically acceptable solution.

This is the power of focusing on technical cooperation even when the political odds seem least in favor of WMD threat reduction. It is why scientists, export-control gurus, and logisticians are so often the unsung heroes of arms control and nonproliferation.

The future

Beyond the plethora of specific lessons they provide, these two volumes, for us, send a more powerful message. Neither maintaining a strategic-weapons enterprise nor improving our scientific expertise and laboratory capabilities requires the United States to develop new nuclear weapons—a notion that is becoming a more common discussion point in Washington. The

constant cycles of improving safety and personnel practices, maintaining current nuclear stockpiles, keeping materials secure, conducting verification activities, and the general pursuits of science will allow our country to maintain its edge. These types of activities, described in such great detail in *Doomed to Cooperate*, should be the focus of Washington's support of nuclear work by its national laboratories.

Today, the leaders who shaped the era of US-Russian cooperation highlighted by the book, such as former Defense Secretary William Perry and former Senator Sam Nunn, are calling for a renewal of bilateral discussions to ease our countries' current tensions. To proceed, we need the types of specific ideas recalled by Hecker and his lab-to-lab colleagues. Their work points toward developing verification models for new arms-control concepts, establishing trilateral cooperation in materials protection, control, and accounting with new entrants to the nuclear-energy market, and creating dialogues to work through differences in techniques and methods. All of these actions offer paths away from a stagnant status quo. Even better: Hecker has provided us with a roadmap to make such ventures even more efficient and effective in the future.

At least one of the book's participants believes that future may be a distant one. In what became one of the "Q&A Roundtable" chapters in the first volume, Vladimir I. Yuferev was asked in Moscow in April 2014 about the prospects for renewed US-Russian collaboration. "We'll get back to cooperation," he responded, "but likely not in my lifetime."

Yuferev concludes by noting the importance of this compendium for preserving the memories and lessons of past lab-to-lab collaboration for future generations. We couldn't agree more. Our governments still need great scientists to work in our national laboratories, in the legislature, and in the executive branch. Continued government support for activities like the Emerging Leaders in Biosecurity Initiative, and programs by the nuclear labs to attract women, minorities, and wounded veterans will play important roles in attracting future Sig Heckers to government service.

These programs are necessary but not sufficient. The best of the next generation will only stay in career paths blazed by luminaries like Hecker if their work is as personally meaningful to them as past nuclear cooperation was to the authors of *Doomed to Cooperate*. More than the rich programmatic details they hold, the greatest hope in these volumes is that they will help communicate to future generations how deeply rewarding this work can be, both in mitigating grave risks to humanity and in starting lifelong friendships.

Disclaimer

The views expressed in this article are those of the authors and do not represent the official policy or position of the Department of Defense or US government.

Notes

1. James Baker was secretary of state in the George H.W. Bush administration, Charlie Curtis was deputy secretary of energy in the Bill Clinton administration, and Rose Gottemoeller and Ernie Moniz were under secretary of state for arms control and secretary of energy, respectively, in the Barack Obama administration.

2. US Department of State, "Framework for Elimination of Syrian Chemical Weapons," Press Release, September 14, 2013.

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