



# Re-Examining the State of Radiological Source Security in Russia<sup>1</sup>

Alex Bednarek<sup>2</sup>, Ioanna Iliopoulos<sup>3</sup>  
July 2017

## Abstract

Securing radioactive sources presents a unique and complex challenge due in large part to their diverse physical properties, applications, and operating environments. Considerably more prevalent than nuclear materials, radioactive sources are used throughout the world for medical, industrial, agricultural, research, and other purposes. Sources include radioactive materials that are encapsulated in solid form and can range from iodine seeds used for internal radiotherapy treatment, to industrial irradiators - weighing several tons, used for large-scale sterilization at fixed facilities. Sources can be found at both hospitals in city centers, through which thousands of people pass daily, and highly remote locations, where individuals or small teams use portable devices for a variety of industrial purposes.

Over the last 75 years, Russia and the former Soviet Union have produced at least half a million of these individual ionizing radiation sources for domestic use, and since the fall of the Soviet Union, Russia has continued to serve as one of the world's largest producers, users, and exporters of long-lived radiological sources. While perhaps the ultimate security threat facing

---

<sup>1</sup> This paper was prepared for the 58<sup>th</sup> Institute of Nuclear Materials Management (INMM) Annual Meeting Proceedings.

<sup>2</sup> Alex Bednarek currently works with NTI's Material Security and Minimization program. At NTI, he focuses on the nexus of nuclear/radiological material security and terrorist activities throughout Russia, Eastern Europe, and Central Asia. Prior to working for NTI, Bednarek served as an intern on the U.S. House of Representatives Subcommittee for Terrorism, Nonproliferation, and Trade. He has also done work related to political consulting, territorial conflict and resolution, and international aid. Bednarek holds a bachelor's degree from the University of Texas at Austin and a master's degree from The George Washington University's Elliott School of International Affairs.

<sup>3</sup> Ioanna Iliopoulos serves as a Senior Consultant to NTI and brings more than 20 years of experience in national security and non-proliferation policy. For the past 14 years, Iliopoulos had been supporting the U.S. Department of Energy's non-proliferation and national security programs. She holds a Master of Science degree from the London School of Economics and Political Science.

the world today is a terrorist organization procuring fissile nuclear materials for use in an improvised nuclear device, it is far more likely that terrorist organizations manage to obtain radiological materials for use in a “dirty bomb,” which can have significant effects if used in areas of high population density. This paper therefore: explores the potential for a radiological attack, as well as the possible outcomes of such an event; presents an overview of the state of radiological material security and disposal in Russia; and highlights progress made, both domestically and internationally, in securing these materials.

## Introduction

Securing radioactive sources presents a unique and complex challenge due in large part to their diverse physical properties, applications, and operating environments. Considerably more prevalent than nuclear materials, radioactive sources are used throughout the world for medical, industrial, agricultural, research, and other purposes. Sources include radioactive materials that are encapsulated in solid form and can range from iodine seeds used for internal radiotherapy treatment, to industrial irradiators – weighing several tons, used for large-scale sterilization at fixed facilities. Sources can be found at both hospitals in city centers, through which thousands of people pass daily, and highly remote locations, where individuals or small teams use portable devices for a variety of industrial purposes. Many facilities that use these radiological sources in various applications are not well-protected - they are open facilities with minimal or no physical protection or trained on-site security forces. These are, by their very nature, open environments and accessible for large numbers of people. Poor chain-of-custody procedures and insufficient regulatory controls have led to loss of control over thousands of radioactive sources. Even in States with regulatory controls in place, high disposal costs and a lack of repositories have led end-users to abandon radioactive sources at the end of their lifecycle.

These challenges are only magnified in Russia, as the size and complexity of Russia’s life-cycle management of radiological sources presents a major challenge for both Russia’s domestic policy, as well as the international community. Over the last 75 years, Russia and the former Soviet Union also produced at least half a million individual ionizing radiation sources for domestic use. Russia has long been one of the world’s largest producers, users, and exporters of long-lived radiological sources; it is the only producer of Cesium-137 for worldwide distribution and produces roughly one-half of the world’s Cobalt-60. These are also the materials that could be used to build a radiological dispersion device (RDD), more commonly known as a “dirty bomb”. Since the fall of the Soviet Union, challenges have persisted with securing these radiological sources. Due to neglect, loss, and inadequate security, some of these radioactive sources are in unknown locations or states of use. Consequently, there is a serious risk of these materials falling into the wrong hands. Indeed, facing severe budgetary constraints due to its weakened economy, the Russian government is unlikely to prioritize funding for security of these sources, let alone develop a comprehensive inventory of all sources located inside the country.

This paper will present an overview of the state of radiological source security in Russia today, highlight progress made to date to improve Russian radiological security, and raise questions relevant both for Russian and international security. It is important to note at the outset, however, that this overview is hindered by the lack of publicly available information on this issue.

## Russia Materials and Facilities

According to a 2007 report by the National Academy of Sciences, Russia (and the former Soviet Union) produced at least 500,000 radioactive sources over the last 75 years. Some estimates put the figure at close to a million sources, although the total figure is unknown due to poor accounting of these sources during and after production. Russia is the world's largest exporter of many of these materials. Russia is the only remaining global exporter of Cs-137, and produces roughly one-half of the world's Co-60 at the Mayak and Dmitrovgrad nuclear facilities.<sup>4</sup> Russia's radiological sources are used in various different processes and pieces of equipment, and can be found throughout the country in a variety of facilities.

### *Materials: Radioisotope thermoelectric generators (RTGs)*

A major source of concern for radiological security in Russia are **radioisotope thermoelectric generators** (RTGs). Invented in 1954, RTGs were created as a desirable power source for equipment and installations without regular human interaction. RTGs could provide steady amounts of power over a much longer period of time than fuel cells, batteries, or other types of generators.<sup>5</sup> From the 1970s-1990s, the Soviet Union built over 1,000 RTGs for use in installations such as unmanned lighthouses and navigation beacons. These RTGs, powered by Sr-90, were given a life span of 10 years. All of these RTGs far outlived their expiration dates and were left to decay throughout Russia. Some of them were stripped of their casings, not only exposing the core to nature, but also endangering people that came into contact with the irradiated metal.<sup>6</sup> The process of locating and decommissioning these RTGs began in 2001, when Norway initiated international cooperation. Within the next several years, the United States, Canada, and France joined the process. As of September 2016, the international coalition has located and decommissioned all but thirteen RTGs throughout Russia and the Arctic Circle. The United States has helped locate and decommission 487 of these recovered RTGs, totaling over thirty million curies of radiological material secured, making them the leading partner in this coalition.<sup>7</sup>

---

<sup>4</sup> Jill Zubarev and Garry Tittimore, "The Global Threat Reduction Initiative: Enhancing Radiological Security in the Russia Federation," IAEA, 2007, [www.iaea.org/OurWork/ST/NE/NEFW/CEG/documents/ws052007\\_15E.pdf](http://www.iaea.org/OurWork/ST/NE/NEFW/CEG/documents/ws052007_15E.pdf)

<sup>5</sup> B.C. Blanke et al., "Nuclear Battery-Thermocouple Type Summary Report," United States Atomic Energy Commission, October 1, 1960, <http://www.osti.gov/scitech/servlets/purl/4807049>

<sup>6</sup> Stephen J. Porter et al., "Successful Recovery and Decommissioning of Russian RTGs – A Cooperative International Effort," Paper presented at the Institute of Nuclear Materials Management conference, Indian Wells, California, July 16-20 2016; Interview with Department of Energy Project Staff, September 23, 2016.

<sup>7</sup> Ibid.

Many of these RTGs have been replaced with alternative power sources (APS units). These APCs run on solar power in all but a few special cases, in which the French built hybrid solar- and wind-powered APCs. Replacing RTGs with APS units presents a challenge in many cases, not only because of the different environments these APS units need to be constructed for, but the removal of RTGs can be an arduous process.<sup>8</sup>

*Materials: Other ionizing radiation sources (IRSs)*

In 2007, the Committee on Opportunities for U.S.-Russian Collaboration in Combating Radiological Terrorism released a comprehensive report detailing collaboration between the two nations. The committee worked with the Nuclear Safety Institute of the Russian Academy of Sciences (IBRAE) to prepare a report on the distribution, protection, and control of **ionizing radiation sources (IRSs)** in Russia. IBRAE reported to the committee that there were more than 500,000 IRSs in Russian possession, although outside experts believe that the number is far larger than that, possibly reaching close to one million. In addition, Russia has been one of the world's leading exporters of radionuclides and IRSs for many years.<sup>9</sup>

These IRSs, both Soviet and Russian made, are located throughout Russia and the former Soviet territories in varying states of use and security. According to a 2014 report issued by the National Nuclear Security Administration (NNSA), Russia currently has **over 800 buildings with high-activity sources** in use. These buildings include everything from medical facilities to industrial sites. In an effort to effectively mitigate the threat of radiological material theft, the NNSA's Global Threat Reduction Initiative (GTRI) program has worked with these sites to "design, install and maintain upgrades" as well as "supplement physical protection upgrades with comprehensive training on radiological security principals and incident response." As of November 2014, the GTRI program has worked to upgrade the physical protection of 295 of these buildings.<sup>10</sup>

In accordance with provisions in the International Atomic Energy Agency (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources, in which Russia has made a political commitment to support, the regulatory authority should have in place the means to ensure that sealed radioactive sources are kept under constant control by authorized users and to ensure that any orphan sources discovered within their territory are promptly brought under regulatory control and managed safely and securely. However, due to funding limitations, insufficient staffing and training, inadequate equipment, and the lax reinforcement of laws and regulations, Russia continues to face challenges with orphan sources.<sup>11</sup>

---

<sup>8</sup> Logistics for RTG removal vary greatly depending on region, climate, and cost effectiveness, and are subject to issues such as equipment availability, climate- and terrain-specific accessibility, and in some cases, wildlife interference. As of today, 536 APCs have been installed at selected sites.

<sup>9</sup> "U.S.-Russian Collaboration in Combating Radiological Terrorism," p. 44

<sup>10</sup> Hallock, "Radiological Security Cooperation"

<sup>11</sup> It is worth noting that, as a major producer of sources, Russia exports lots of materials to other countries and refuses to take back these sources when they reach the end of the life. The IAEA has recently finalized a Supplemental Guidance Document on this topic, and Russia was the only country that tried to stop the process.

Many of these materials may have not been subject to regulation, or they may have been regulated initially but then were abandoned, lost, misplaced, stolen, or removed without authorization. These end of life and orphaned sources present their own unique security vulnerabilities. Orphan sources by definition have no one purposefully providing security. The acquisition of an orphan source for malicious purposes would be unnoticed and unreported. While it is unknown exactly how many radioactive sources have been orphaned over the decades, as of November 2014, the GTRI program has helped locate and recover over 10,000 disused or orphaned sources throughout the former Soviet Union, totaling nearly one million curies.<sup>12</sup>

### *Waste Management Facilities*

**Radon** facilities were established beginning in the 1960s as a means of collecting, transporting, processing, and disposing of low- and intermediate-level radioactive wastes (LILW) and disused sealed radioactive sources (DSRS). Thirty-five RADON facilities were built in the former Soviet Union, with sixteen of them now residing within Russian Federation territory.<sup>13</sup>

DSRS containers contain radioactive waste with high levels of specific activity. The average radionuclide composition within these DSRS containers is 40% Cs-137, 25% Co-60, 22% Sr-90, 8% Ir-192, 4% Tm-170, and 1% Pu-239. As of 2006 all of these sites had nearly met their maximum capacities for radioactive waste storage and Russia has struggled to identify and fund a permanent repository for the disposal of radioactive waste.<sup>14</sup> Russia has not agreed to recycle or repatriate sources, which has significant repercussions for other nation-states because Russia is a major manufacturer of several key isotopes (Am-241, Cs-137, etc.) actively used in radioactive sources.

Several Radon facilities are operated as *disposal facilities for institutional LILW without intention of the waste retrieval*. The radioactive sources are placed within large metal drums that are then filled to capacity with concrete. The containers are then buried several meters below the ground. Radioactive sources with very high levels of specific activity are sometimes given twice the protection – placed in a small drum filled with concrete, which is then placed in a second, larger drum that is also filled with concrete.<sup>15</sup>

---

The absence of a “return to supplier” provision in their laws, as well as the position that they will not take back anything that is considered “waste”, has resulted in other countries struggling to deal with these materials when they are no longer in use.

<sup>12</sup> Andrew Hallock, “Radiological Security Cooperation in the Former Soviet Union,” Presented at the 28<sup>th</sup> Plenary Meeting of the IAEA Contact Expert Group, November 19, 2014.

<sup>13</sup> Andrey Guskov, “DSRS Management in Russia,” Presented at the IAEA Workshop on Sustainable Management of Disused Sealed Radioactive Sources, Lisbon, Portugal, October 11-15, 2010, <http://www-ns.iaea.org/tech-areas/waste-safety/workshops/lisbon-dsrs2010.asp?s=3&l=24>

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

While the sixteen Radon facilities continue to serve as regional storage and disposal facilities that handle a wide variety of unwanted and spent ionizing radiation sources, many have already reached their maximum storage capacity. This will continue to present Russia with waste management challenges until the necessary political, financial, and legal obstacle are cleared, and a designated national waste repository is identified.

## Security Concerns

Throughout these radiological facilities, as well as government accountability offices, security issues have presented themselves in several different ways. The following section addresses these security issues.

The central component of control and accounting of IRSs is the network of information and analytic centers (IACs) that support the various ministries, agencies, and other federal-level organizations involved with nuclear and radiological security in Russia. Issues with the network of IACs lead to issues with the security and assessment of IRSs. There have been several common issues that have been reported in regards to IAC operations, and almost all of them can be linked to **insufficient funds**.<sup>16</sup> The cost for proper disposal of one of the larger excess IRSs at a surveyed RADON plant in Russia was estimated at \$90,000. A large-scale project to locate and dispose of all disused IRSs in Russia is not something that the Russian government has been willing to undertake, nor is it a project that is particularly feasible. Decisions on disposal, therefore, are made on a case-by-case basis.<sup>17</sup> Lack of funding has led to poor physical protection of their offices, staff deficiencies, inadequate training opportunities, and a lack of standardized documents that govern their activities and interactions with other organizations. All of these issues are fixable given proper funding and support, but without that, the IAC networks will continue to be inadequate in controlling and accounting for IRSs throughout the country.<sup>18</sup>

In addition to network and control issues, some very serious physical security problems were highlighted in the above-mentioned 2007 Committee on Opportunities for U.S.-Russian Collaboration report. During a joint 2004-05 survey of radiological facilities between the committee and IBRAE, at least five of the sites visited had serious security flaws.<sup>19</sup> Several of these sites had extremely poor security, allowing relatively easy access for potential thieves. One such facility was subjected to flooding, adversely affecting the strength of the doors and walls. This facility also contained over 20,000 curies of Co-60, and was located 300m from a school, apartment complex, and other facilities.<sup>20</sup> IBRAE noted that, of the dozens of facilities that had been visited, a majority of them had adequate security.<sup>21</sup> However, the examples provided by the committee raised a great deal of concern. A determined thief, or group of ill-

---

<sup>16</sup> "U.S.-Russian Collaboration in Combating Radiological Terrorism," p. 56-7

<sup>17</sup> Ibid., p. 53

<sup>18</sup> Ibid., p. 57

<sup>19</sup> Ibid. p. 53

<sup>20</sup> Ibid., p. 53-4

<sup>21</sup> Ibid., p. 54

willed individuals, could have broken into any of these facilities without great difficulty and stolen a troubling amount of radioactive material. However, as this report is over 10 years old, improvements to security of these facilities may have been made.

While these conditions do not necessarily represent the vast majority of facilities throughout Russia, unwanted IRSs have very little value, making them less likely to be adequately secured. Russia has shown on several occasions that radiological source security is not a high priority. Most recently, at the 2014 Nuclear Security Summit (NSS), at which a Russian delegation was in attendance, 23 countries signed a declaration of intent known as the Joint Statement on Enhancing Radiological Security. This joint statement supported the creation of: an international regulatory body; comprehensive and cohesive security plans; international cooperation; a framework for facility security; and holistic regulatory frameworks for source transportation, possession, and disposition. Russia was not a signatory to this agreement, despite being one of the world's largest producers of radiological source material.<sup>22</sup>

## Consequences of a Radiological Terrorist Attack

The potential for substantial **economic damage** could be a driving factor behind launching a radiological terrorist attack. Often referred to as a weapon of mass *disruption*, the resources that would need to be dedicated to cleaning up the dispersal of high-activity radioactive material, especially in an urban place with high traffic or large population, would be immense. A radiological attack could severely disrupt the safety of any nearby businesses, government offices, medical facilities, or transportation centers, which could spiral into significant local or regional economic damage. Economic damage could reach into the range of billions of dollars when incorporating: recovery costs such as relocation, compensation, and health care; business costs in terms of economic activity impact; and perception costs which could include a diminished willingness to purchase goods and services or invest in the affected area.

The economic consequences of an RDD event are highly dependent on the clean-up level selected. As there are no standards for acceptable decontamination of a radiological weapon event<sup>23</sup> the standard selected will impact both the cost and the pace of the cleanup. For a substance such as cesium-137 with a 30-year half-life, it would require waiting at least six or seven half-lives or about 200 years until the material has decayed to very small amounts (Chernobyl example – cheaper to create an exclusion zone than to clean up to a publicly acceptable level). If there is a radiological terrorist event and the clean-up standard is “negotiated” after the incident, it is likely that the public will demand the most stringent level

---

<sup>22</sup> “Statement on Enhancing Radiological Security,” U.S. State Department, March 24, 2014, <http://www.state.gov/documents/organization/235507.pdf>

<sup>23</sup> For example, in the United States, there is only a recommended evacuation/relocation Protective Action Guidelines established by EPA and DHS (2 rem/year).

for decontamination. This will result in the highest costs for clean-up. **Widespread panic** would most likely occur among at least the local population.<sup>24</sup>

This widespread panic could also lead to **infrastructure overload**, especially with regards to medical facilities. Hospitals, clinics, pharmacies, and government facilities would be overloaded with terrified people and potential patients. This could, in turn, prevent people in other emergency situations from getting the help that they need.<sup>25</sup> If there are casualties, they will likely be caused by the initial blast of the conventional explosive. In most plausible scenarios, the radioactive material would not result in acutely harmful radiation doses, and the public health concern from the radioactive materials would likely focus on the chronic, or the long-term risk of developing cancer. Long-term health effects are possible for people directly exposed to the dispersed radiation, however if the radiological material is dispersed in respirable form, those risks are much higher.

#### *Lost or Stolen Sources and the Potential for Terrorist Interest in RDD Materials*

Information reported to the International Atomic Energy Agency (IAEA) Illicit Trafficking Database confirms the persistent theft and loss of radioactive sources. The recovery rate of stolen or lost radioactive sources has been poor. The possibility that some of this radioactive source material is being trafficked cannot be excluded. In its Global Incidents and Trafficking Database, the Monterrey Center for Nonproliferation Studies reports that in 2013 and 2014 there were 325 incidents in which nuclear and radiological material was lost, stolen, or otherwise determined to be outside of regulatory control. Most – about 85 percent – of recorded incidents in the database involved non-nuclear material, or the ingredients for a dirty bomb.

All of these challenges are against the backdrop of an evolving threat environment, whereby the likelihood of a dirty bomb attack is increasing. The Islamic State has demonstrated a worldwide reach. Using social media prowess, it recruits fighters and supporters from around the world. According to a recent report from the National Counterterrorism Center, ISIS has rapidly expanded its terror network from seven countries in 2014 to eighteen countries in 2016 and it is looking to further expand to other countries. The terrorist attacks seen in cities around

---

<sup>24</sup> Anyone within relative range of the attack would fear for both their immediate and long-term health. Areas could be abandoned for a significant period of time, leaving people without homes or jobs. Media outlets would be covering the attack for quite a while, not allowing it to leave public consciousness. It is an extremely difficult process to convince large groups of people that they are safe in the wake of an attack, especially one that could have lasting consequences.

<sup>25</sup> If there are casualties, they will likely be caused by the initial blast of the conventional explosive. In most plausible scenarios, the radioactive material would not result in acutely harmful radiation doses, and the public health concern from the radioactive materials would likely focus on the chronic, or the long-term risk of developing cancer. Long-term health effects are possible for people directly exposed to the dispersed radiation, however if the radiological material is dispersed in respirable form, those risks are much higher.



also point to disturbing trends. Domestic terrorism around the world has increased over the past several years. Plots are being carried out by affiliates of ISIL and/ or lone wolf operatives; the trend is towards smaller and less complicated plots – an RDD could fit this scenario.

There are several violent actors that could seek out to launch an attack like this – either in Russia, or using Russian-made radiological materials. Among the most likely perpetrators are **Chechen terrorists**. The Chechen people of the North Caucasus region of Russia have long had issues with the Russian government, leading to war twice since the fall of the Soviet Union. An **ISIS/al-Qaeda affiliate organization or person** could also potentially attempt an attack of this nature. As ISIS continues to lose territory throughout Syria and Iraq, a trend is starting to emerge where more and more militant fighters are returning home. Russia, according to estimates by the Soufan Group, is responsible for approximately 2,400 foreign fighters taking part in the Syrian Civil War, making it the largest non-Arab contributor to foreign fighter numbers.<sup>26</sup> As more foreign fighters return to Russia, the threat may grow.

However, even if an attack is not perpetrated in Russia, there is still risk that unsecured Russian-made radiological material could fall into the hands of ISIS or al-Qaeda via **smugglers or criminal organizations**. This situation has presented itself several times, most recently in November 2015 in Moldova when a smuggler named Valentin Grossu was caught attempting to sell a significant amount of Cesium-137 to an ISIS representative. Grossu claimed that he was in possession of enough Cesium-137 to contaminate several city blocks, and was attempting to sell it for €2.5 million. This was the latest of at least four attempts since 2010 in which criminals with suspected ties to Russia attempted to sell radioactive materials to extremists through Moldova.<sup>27</sup>

Organized crime and corruption, especially in the closed nuclear cities of Russia, is not a new development. A December 2005 policy memo in PONARS came to the troubling conclusion that “there are increasing threats that terrorist groups could use existing criminal networks and corruption to steal nuclear materials.” Many of these existing criminal networks and smuggling routes, into and out of closed nuclear cities such as Ozyorsk, stem from a largely ignored drug problem. In 1999, the closed city of Ozyorsk in the Chelyabinsk Oblast had the most drug users per capita in Russia.<sup>28</sup> While that number has maybe fallen over the past 17 years, these drug smuggling channels remain open. Rampant corruption, combined with opportunities to exploit workers and citizens of closed cities, provide terrorist organizations and transnational organized crime groups a window to nuclear and radiological material smuggling.

---

<sup>26</sup> “Foreign Fighters: An Updated Assessment of the Flow of Foreign Fighters into Syria and Iraq,” The Soufan Group, December 2015, [http://soufangroup.com/wp-content/uploads/2015/12/TSG\\_ForeignFightersUpdate1.pdf](http://soufangroup.com/wp-content/uploads/2015/12/TSG_ForeignFightersUpdate1.pdf)

<sup>27</sup> Desmond Butler and Vadim Ghirda, “Nuclear black market seeks IS extremists,” AP, October 7, 2015, <https://apnews.com/9f77a17c001f4cf3baeb28990b0d92eb/ap-investigation-nuclear-smugglers-sought-terrorist-buyers>

<sup>28</sup> Robert Orttung and Louise Shelley, “Linkages Between Terrorist and Organized Crime Groups in Nuclear Smuggling,” PONARS Eurasia, December 2005, [http://www.ponarseurasia.org/sites/default/files/policy-memos-pdf/pm\\_0392.pdf](http://www.ponarseurasia.org/sites/default/files/policy-memos-pdf/pm_0392.pdf)

There is also the risk of a **“lone-wolf” attacker or unaffiliated group** launching an attack in Russia or abroad with Russian materials. While these attacks are much harder to detect or prevent, there have been no documented successful radiological attacks by a lone-wolf in Russia.

However, potential incidents and attempted smuggling have been caught before.<sup>29</sup> In April 2009, three people were arrested in Western Ukraine attempting to sell 3.7kg of radioactive material for \$10 million. The Ukraine Security Service determined the radioactive material to be of Soviet origin that had been smuggled into Ukraine for sale.<sup>30</sup>

## Conclusion

Although much has been done between the United States, Russia, and other international partners to address the issue of Russian radiological material security, there still remains much to do. There are an unknown amount of ionizing radiation sources located throughout the country in varying states of use. Facilities housing some of these materials have inadequate security and protection. Every year, incidents of unauthorized possession, loss, or smuggling of these materials occur. As of December 2014, there is no longer any new bilateral cooperation planned between the United States and Russia on the state of radiological security in Russia. This has direct implications for threat mitigation investments that the United States and other countries have provided Russia over the past decade and whether complacency, competing budget priorities, and other factors lead to the erosion of security measure put in place. With the scope required to address cradle-to-grave radiological security, there is concern that this will not be a high priority for Russia and the work will not continue.

Although the Russian Federation has made a political commitment to the IAEA Code of Conduct on the Safety and Security of Radioactive Sources, and has politically committed to adopt its provisions, there is very little transparency and reporting on the status of Russia’s radiological security efforts that are shared with other member states<sup>31</sup>. This lack of transparency and reporting is further complicated by the cessation of U.S.-Russian Federation bilateral

---

<sup>29</sup> In April 2016, a man left a package containing five ampoules of Cobalt-57 and concentrated Radon in a car parked in Vnukovo International Airport. The material was detected by sensors and was removed from the lot.

<sup>30</sup> Clifford J. Levy, “Ukraine Says 3 Tried to Sell Bomb Material,” *New York Times*, April 14, 2009, <http://www.nytimes.com/2009/04/15/world/europe/15ukraine.html? r=0>

<sup>31</sup> During the 2014 Nuclear Security Summit, Russia provided a National Report indicating laws and regulations on accountability, control, and physical protection of radioactive sources, and materials are being constantly improved - taking into account both national experience in this area and the experience of foreign states and international organizations, including the IAEA. Thus, in 2012, revised federal norms and rules entitled ‘Principal Rules for Accounting and Control of Radioactive Materials and Radioactive Wastes in Organizations’ were approved, setting requirements on accountability and control, taking into account, inter alia, the ranking of radioactive materials based on their potential to cause harm; in 2014 revised federal norms and rules entitled "Rules Regarding Physical Protection of Radioactive Materials, Sources and Storage Facilities" were adopted. The radioactive source register is being kept and improved.

arrangements. Without significant bilateral or multilateral cooperation, Russia is unlikely to fully undertake this task. International support is imperative if this threat is to be properly mitigated. U.S.-Russian Federation radiological security demands a new paradigm for advancing radiological security cooperation. It is in our mutual interests.

## About the Authors

**Alex Bednarek** currently works with NTI's Material Security and Minimization program. At NTI, he focuses on the nexus of nuclear/radiological material security and terrorist activities throughout Russia, Eastern Europe, and Central Asia. Prior to working for NTI, Bednarek served as an intern on the U.S. House of Representatives Subcommittee for Terrorism, Nonproliferation, and Trade. He has also done work related to political consulting, territorial conflict and resolution, and international aid. Bednarek holds a bachelor's degree from the University of Texas at Austin and a master's degree from The George Washington University's Elliott School of International Affairs.

**Ioanna Iliopulos** serves as a Senior Consultant to NTI and brings more than 20 years of experience in national security and non-proliferation policy. For the past 14 years, Iliopulos has been supporting the U.S. Department of Energy's non-proliferation and national security programs. She holds a Master of Science degree from the London School of Economics and Political Science.

## About the Nuclear Threat Initiative

The Nuclear Threat Initiative works to protect our lives, environment, and quality of life now and for future generations. We work to prevent catastrophic attacks with weapons of mass destruction and disruption (WMDD)—nuclear, biological, radiological, chemical, and cyber. Founded in 2001 by former U.S. Senator Sam Nunn and philanthropist Ted Turner who continue to serve as co-chairman, NTI is guided by a prestigious, international board of directors. Ernest J. Moniz serves as chief executive officer and co-chairman; Des Browne is vice chairman; and Joan Rohlfing serves as president.