

## **MODELS FOR IMPACT: CIVIL SOCIETY ENGAGEMENT IN SUPPORT OF NUCLEAR SECURITY**

L.S.H. HOLGATE  
Nuclear Threat Initiative  
Washington, DC USA  
holgate@nti.org

### **Abstract**

Nuclear security impacts everyone. Just as a nuclear accident anywhere is an accident everywhere, so too would a nuclear security incident anywhere have global effect. While nuclear security is formally the responsibility of the state, the reality is that multiple stakeholders hold responsibility for nuclear security – from the legislators establishing laws that support nuclear security, to the regulators developing and implementing regulations, to the industrial, commercial and medical operators of nuclear technology. In that context, civil society can play an important role in supporting governments in strengthening nuclear security around the world. Civil society can provide valuable links between government and industry, raise awareness of the importance of nuclear security amongst different levels of stakeholders, undertake research into nuclear security issues, convene stakeholders for cross-disciplinary discussions, help governments advance policies, and keep governments accountable to their commitments and for their actions. Civil society also can bring creativity, innovation and flexibility to challenging problems, and provide opportunities for action that may not be available to governments. Additionally, civil society is an important link that connects governments, industry, and the general public, and helps build strong support for nuclear security across sectors.

### **1. INTRODUCTION**

Nuclear security impacts everyone. Just as a nuclear accident anywhere is an accident everywhere, so too would a nuclear security incident anywhere have global effect. While nuclear security is formally the responsibility of the state, the reality is that multiple stakeholders hold responsibility for nuclear security – from the legislators establishing laws that support nuclear security, to the regulators developing and implementing regulations, to the industrial, commercial and medical operators of nuclear technology. In that context, civil society can play an important role in supporting governments to strengthen nuclear security around the world. Civil society can provide valuable links between government and industry, raise awareness of the importance of nuclear security amongst multiple stakeholders, undertake research into nuclear security issues, convene stakeholders for cross-disciplinary discussions, help governments advance policies, and keep governments accountable to their commitments and for their actions. Civil society can also bring creativity, innovation and flexibility to challenging problems, and provide opportunities for action that may not be available to governments. Additionally, civil society is an important link that connects governments, industry, and the general public, and helps build strong support for nuclear security across sectors.

The Nuclear Threat Initiative (NTI) has developed an impact model that enables it to work with governments around the world to reduce global threats, including nuclear security. This model involves four steps, which may be conducted in different sequences. The first is developing open-source expert analysis to help identify good practices, gaps in activities, and potential methods to address those gaps. It also provides unclassified information that can be used to fuel discussions around the world. Equipped with the defined problem set and potential solutions, the second step is to engage global stakeholders through meetings, workshops and seminars. These seek to stimulate collective self-interest and align essential forces worldwide to accomplish key goals and objectives. In specific circumstances, the third direct action step tests and demonstrates innovative solutions to the problem. Finally, some of these direct-action activities ultimately drive systemic change through institutional adoption and scale-up of proven programs and practices. The paper illustrates how NTI has applied this impact model to improve nuclear and radiological security around the world by reviewing four hallmark NTI projects.

## 2. HEU MINIMIZATION: PROJECT VINCA [1]

### 2.1. Analysis

From 2001 to 2010, NTI published a series of reports on global nuclear security produced by Harvard University's Belfer Center for Science and International Affairs. These seminal *Securing the Bomb* reports reviewed nuclear security threats and proposed solutions for governments, industry actors, and international organizations, where the findings were widely read and discussed. Among the risks identified in the first edition of *Securing the Bomb* was the Vinca Institute in the orchards above Belgrade, which held over 50 kg of highly enriched uranium (HEU) in various forms, as well as large quantities of spent low-enriched uranium (LEU) fuel and radioactive waste. Prior to 9/11, these kinds of materials were considered by U.S., Russian and some IAEA officials to be low-priority risks, but the dramatic attacks by Al-Qaeda and the increased awareness of their apocalyptic ideology resulted in rising concerns about the vulnerability of small quantities of weapons usable material at civilian research facilities.

### 2.2. Engagement

NTI leaders understood that the U.S. Government had made some attempts to remove the HEU and urged State Department staff to consider new approaches, but the disintegration of Yugoslavia created difficulties for U.S. officials to work directly with former Yugoslav officials. With the departure of Serbian President Slobodan Milosevic, a window of political opportunity opened, but initial negotiations stalled because the Serbian government refused to agree to remove the HEU without also addressing at least some of the other, non-weapons-usable materials stored at Vinca. Knowing of NTI's interest in Vinca and trusting in NTI's reputation and discretion, State Department officials reached out to NTI to contribute to a package of support for the full range of materials, since U.S. Government nonproliferation resources could only be spent on HEU-related activities. NTI joined in a multi-part negotiation among Serbian and U.S. officials, IAEA staff, and a Russian transportation firm to ultimately agree on a path forward for removal of the HEU and subsequent steps to address the spent fuel and the radioactive waste, funded in part by \$5 million from NTI.

### 2.3. Direct Action

As a direct result of NTI's contribution to addressing Serbia's priorities, technical and security teams from Serbia, the United States, the IAEA, and Russia packaged and removed the HEU in August 2002. The HEU was transported by air to a Russian nuclear facility where it was blended down to LEU, rendering it useless for a nuclear weapon. NTI's \$5 million contribution was provided to the IAEA to address spent fuel and radioactive waste at the Vinca institute, where it ultimately attracted over \$30 million from other donors and became, at the time, the largest single IAEA project. The HEU removal was featured in newspapers and reports in Washington, D.C, and around the world, thereby raising the profile of the concerns about HEU in civilian research facilities, as well as the mechanisms to eliminate these risks. The IAEA's coordinated efforts also significantly reduced risks associated with the spent fuel and radioactive waste, which are now understood to also pose risks of theft and misuse.

### 2.4. Systemic Change

Following the removals, the U.S. Congress and other nongovernment organizations began to highlight the gaps in U.S. nonproliferation and nuclear security programs that required NTI's more flexible funds to fill. Within a year, new authorities and funding had been made available to the U.S. Department of Energy, and in 2004 U.S. Secretary of Energy Spencer Abraham announced, sitting next to IAEA Director General Mohamed ElBaradei, the Global Threat Reduction Initiative (GTRI), which combined a number of disconnected programs into a single, high-profile, well funded effort to address the full range of challenges related to civilian HEU, from research reactor conversion to LEU fuel development to HEU removals and blend down to physical security upgrades. Secretary Abraham invited the IAEA to join with DOE and other countries to "complete the

repatriation of all Russian-origin spent fuel by 2010.” NTI’s \$5 million contribution for Project Vinca helped spur the creation of GTRI that ultimately spent \$3 billion on nuclear and radiological security activities, including the removal of approximately 200 bombs-worth of nuclear material. As a result of these and related programs and with the support of over a dozen countries, the number of countries with HEU has now declined from over 40 to 22. This permanent elimination of weapons-usable material has been a major contribution to reducing nuclear risks around the world.

### 3. NUCLEAR SECURITY INDEX AND THE GLOBAL DIALOGUE: SUPPORTING THE SUMMITS

#### 3.1. Analysis

After the first Nuclear Security Summit in April 2010 and with the prospect of a second Summit in 2012, NTI observed that despite generating commitments and high-level attention, the Summit did not result in a clear set of priorities for action on nuclear security and no public tool to measure the status of nuclear security in countries around the world. NTI saw an opportunity to fill this gap by producing, in partnership with the Economist Intelligence Unit, a first-of-its-kind tool for tracking progress and promoting further action to strengthen nuclear security. The first Nuclear Security Index (NTI Index) was published in January 2012 – a breakthrough in understanding how countries perform across a range of publicly available indicators of a state’s nuclear security conditions: its security practices, national and international commitments, and general risk environment. The NTI Index challenges governments worldwide to respond to the threat of nuclear terrorism by taking appropriate steps to strengthen nuclear security conditions. It is designed to be used as a tool and as a resource for improvement, not merely as a rating system. As NTI dug deeper into the findings of the Index research and data, NTI concluded [2] that the lack of consensus among countries and experts on nuclear security priorities was undercutting urgent action by governments and hampering international cooperation on nuclear security.

#### 3.2. Engagement

The initial NTI Index and the three subsequent editions in 2014, 2016 and 2018, formed the basis for extensive engagement by NTI with officials and experts from individual countries. Countries’ standing in the NTI Index formed the basis for public statements by their officials at future Summits and elsewhere, as well as their internal discussions about what steps might be taken to improve scores. Some countries used the NTI Index to prioritize their own nuclear security assistance programs, and the 2012, 2014, and 2016 Summit hosts used the NTI Index to develop candidate deliverables for participating leaders to bring forward at each Summit. Each subsequent edition of the NTI Index captured more progress and saw increased scores, indicating that countries were in fact taking steps to improve their nuclear security structures and activities. Since the final Nuclear Security Summit in 2016, the NTI Index has become an important driver of nuclear security improvements.

#### 3.3. Direct Action

In 2012, after the first NTI Index launch, NTI supplemented these bilateral efforts with the Global Dialogue on Nuclear Security Priorities, bringing to life one of the recommendations of the first Index: to create a forum for establishing a common framework for action for securing nuclear materials globally. In so doing, the Global Dialogue bolstered the Nuclear Security Summit process with analysis and wide-ranging ongoing discussion. Today, the Global Dialogue supports the rotating convener of the Nuclear Security Contact Group, the follow-on mechanism to the Summits established by over 30 governments to facilitate cooperation and sustain engagement on nuclear security after the Summits ended. The participants of the Global Dialogue are a mix of government officials, non-government experts, nuclear industry actors, and representatives of intergovernmental organizations. Discussions are typically informed by “food for thought” papers and are designed to drive toward specific actions that support nuclear security within countries, among regions, or in multilateral organizations. Today, the Global Dialogue is a venue for developing concepts for a robust review conference for the Amended Convention on the Physical Protection of Nuclear Materials and Nuclear Facilities (ACPPNM), among other goals. The combination of original research, a “safe zone” for candid discussion

among knowledgeable individuals, and the involvement of officials with responsibilities to implement the ideas generated makes the Global Dialogue a highly effective method of stakeholder engagement.

### **3.4. Systemic Change**

The NTI Index has led to change in several countries. Some countries have updated laws and regulations in areas the NTI Index identified as weaknesses. Other countries that previously did not publish information about their nuclear security practices have become more transparent, going as far as to publish reports for the first time. It is clear that the Index's very existence—and the reputational incentives it creates for governments to do well—has shifted how some governments think about their nuclear security.

The Global Dialogue has also seen significant impact. By including officials who were connected to the official Summit processes and who had influence in decision making, by engaging directly with those officials between the meetings, by carefully adjusting and recrafting concepts to keep them relevant and garner support, and by steering the dialogue toward ambitious, yet realizable, outcomes, what could have otherwise been just a series of meetings has led to policy change. During the Nuclear Security Summits, ideas that were initially mooted and honed in the Global Dialogue made their way into the Communiqués approved by participating leaders. The Global Dialogue also contributed to the significant increase in ratifications of key nuclear security conventions, including the International Convention on Suppression of Acts of Nuclear Terrorism and the ACPPNM, which finally entered into force in 2016.

Following the last Summit, the Global Dialogue has continued to successfully inject creative and ambitious approaches into official discussions in preparation for the 2020 IAEA International Conference on Nuclear Security (ICONS) and the review conference of the ACPPNM, which will be held in 2021. While the results of both conferences are still unknown, there is early evidence that the Global Dialogue has already had significant influence.

## **4. SPIN-OFF: THE WORLD INSTITUTE FOR NUCLEAR SECURITY (WINS)**

### **4.1. Analysis**

NTI's close work with the IAEA as well as the Institute for Nuclear Materials Management (INMM) revealed a critical gap in the global nuclear security architecture: nuclear security practitioners and nuclear industry players lacked a mechanism to discuss their front-line and managerial experiences in implementing nuclear security at their facilities and among their personnel. The IAEA engages primarily with governments, and the INMM interacts primarily with scientific and government experts. Industry-based groups such as the World Association of Nuclear Operators or the Nuclear Energy Institute had different missions and were not prepared to expand their coverage to include nuclear security.

### **4.2. Engagement**

NTI and INMM partnered to undertake a study of what a practitioner-based organization could add to the existing architecture, and how it might best be implemented. Based on this scoping study, NTI and INMM carried out extensive consultations with nuclear industry actors, governments, IAEA officials, and regulators. These consultations led NTI and INMM to determine that no existing organization had the necessary elements to provide an international forum for those accountable for nuclear security to share and promote the implementation of best security practices and to learn from one another.

### **4.3. Direct Action**

NTI and INMM also cohosted two pilot workshops, inviting nuclear security practitioners from around the world, to test the premise that fruitful discussions of best practices in physical protection and in materials, control and accountancy could take place without revealing sensitive information. These workshops received extensive praise from participants, who indicated strong interest in similar offerings. NTI and INMM began developing the principles and operating concept that would become WINS.

#### 4.4. Systemic Change

WINS was launched in December 2008 at the IAEA's headquarters in Vienna with the participation of NTI's co-founder and then-Chief Executive Officer Sam Nunn and IAEA Director General Mohamed Elbaradei, and the support of a number of nuclear industry leaders from around the world. WINS was established in Vienna to maintain close coordination and complementarity with the IAEA's work. Today, WINS has over 6000 members from 145 countries, and has conducted over 100 workshops and training events. The WINS Academy has produced more than 400 Certified Nuclear Security Professionals. WINS leadership and staff are regular participants in intragovernmental meetings, and they have become an established feature in the nuclear security landscape.

### 5. ALTERNATIVE TECHNOLOGIES FOR CESIUM-137

#### 5.1. Analysis

In 2016, NTI released its *Radiological Security Progress Report* [3] reviewing progress by 23 countries that had pledged to secure their most dangerous materials by the end of 2016, among other steps. In developing the report, NTI convened an international panel of advisors who provided instrumental guidance reflecting ongoing international discussions. While most countries were found to have met their commitments or were on track to do so, the report also found significant gaps in the existing global system for securing dangerous radiological materials. NTI undertook additional studies to understand the risks posed by cesium-137 in medical and research irradiation devices, and to learn how other countries – including France, Japan, and Norway – had been able to eliminate cesium-137 irradiators through replacement with effective and safer alternative technologies.

#### 5.2. Engagement

As a result of this solution-oriented research, NTI was one of two non-governmental organizations invited to present recommendations to an international workshop in Berlin set up to inform and educate government officials as they identified state-level actions to enhance security for radiological materials across borders. NTI has also worked with national, state, and local government officials to organize workshops focused on cesium-137 removals and alternative technologies where NTI's expertise can enhance the implementation of government programs. For example, working together with the U.S. Department of Energy, NTI created several workshops for New York City, the City of Atlanta, and the University of California to promote the conversion of cesium-137 blood and research irradiators to effective and less risky X-ray technologies. NTI brought together technical experts, law enforcement officers, hospital managers, researchers and medical personnel, local regulators, first responders, and other interested groups to discuss the impacts of a malicious attack that resulted in theft or release of the highly radioactive cesium-137.

#### 5.3. Direct Action

These authoritative discussions of both the risks of cesium-137 devices and the effectiveness of the X-ray devices helped New York City, Emory University in Atlanta, and the University of California decide to eliminate their cesium-based irradiators and replace them with X-ray machines. NTI supported a similar effort in the United Kingdom in partnership with the Home Office and Pool Reinsurance, which resulted in a decision to replace all cesium irradiators in the UK with X-ray devices. In these cases, the resources of the U.S. and UK governments were critical to implementing these pledges, but they understood that NTI's expert validation of the benefits of converting from cesium to X-ray devices could be more effective as an external perspective.

#### 5.4. Systemic Change

As valuable as these individual risk reduction efforts are, they highlight larger-scale gaps in radiological security systems at national and global levels. NTI's most recent report highlights lessons from the removal decisions in New York City, Atlanta, and the University of California in order to support other jurisdictions in

taking similar action. This report also advocates for systemic change at the level of national regulations for radiological sources and expanded federal funding for cesium removals and cost-sharing on purchases of X-ray devices, as well as for research and development on additional technologies that could replace other high-activity radiological sources.

## 6. CONCLUSION

NTI's operational culture is an important component of its success in effecting meaningful change. NTI is a non-governmental organization, and as such it is independent of any government direction. While based in the United States, NTI does not accept U.S. federal funds. The bulk of NTI's funds come from public and private charities, although it does accept funding from other governments to support existing project areas. This status allows NTI both to be critical of the actions of governments and to work hand-in-hand with governments around the world. NTI is transparent about its work in other countries with both the U.S. Government and with other governments. Because many of NTI's leaders and staff have worked inside government, NTI understands the realities of bureaucratic processes and is able to present practical solutions as part of its engagement and to design direct actions that reduce risk and demonstrate the practicality of its proposals. In order to bring good ideas forward and sharpen them into actionable proposals, NTI carries out a variety of engagement approaches with key actors. In many cases, NTI's non-government status creates opportunities to convene groups that are more diverse and less constrained by official positions.

NTI has been unusually impactful in the area of nuclear security as well as its broader agenda, but it is a model that could be adapted by other civil society organizations in other countries.

## REFERENCES

- [1] BLEEK, P. Project Vinca: Lessons for Securing Civil Nuclear Material Stockpiles, *The Nonproliferation Review*. (Fall/Winter 2003) 1-23, <https://media.nti.org/pdfs/nonprorev-bleek.pdf>
- [2] Nuclear Threat Initiative (Washington), *NTI Nuclear Materials Security Index* (2012) [https://media.nti.org/pdfs/NTI\\_Index\\_FINAL\\_1.pdf](https://media.nti.org/pdfs/NTI_Index_FINAL_1.pdf), 27.
- [3] Nuclear Threat Initiative (Washington), *Radiological Security Progress Report* (2016) [https://media.nti.org/documents/NTI\\_Rad\\_Security\\_Report\\_final\\_0916.pdf](https://media.nti.org/documents/NTI_Rad_Security_Report_final_0916.pdf)