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Policy Memo

DATE: November 1, 2014

SUBJECT: Strengthening International Cooperation on Nuclear Materials Security

Ensuring that states keep nuclear weapons and weapons-usable materials out of the hands of terrorists requires bilateral and multilateral cooperation. For over two decades, the United States and Russia have worked together to establish effective, modern nuclear security and accounting systems. US cooperation with China has been nearly as long, though more limited. Over that time, security in all three countries has improved because of independent and cooperative efforts.

There are, however, challenges ahead. The conflict in Ukraine, broad political differences, and long-standing unresolved issues related to nuclear security cooperation may cause Russia to decline additional support in this area from the United States after 2014. In China, spying accusations and limited information about security at Chinese facilities has hindered the expansion of cooperation.

The Stanley Foundation convened a group of experts and policymakers from the United States and abroad to address these issues October 15–17, 2014, at its 55th annual Strategy for Peace Conference. The group discussed overcoming challenges to nuclear security cooperation faced by the United States, Russia, and China, and next steps in ensuring that countries put in place effective and sustainable nuclear security measures with strong security cultures.

The objectives of the roundtable were to identify the potential of and constraints on nuclear security cooperation and to develop options for action that would strengthen and sustain nuclear security. As part of the discussion, the group assessed what strategies are most effective for strengthening and sustaining physical security and security culture at the operator and organizational levels; whether cooperation to strengthen security was still in the interests of all countries and to what extent; what strategies would best help facilitate cooperation; and whether there are new approaches to cooperation that should be considered. The group also examined ways to identify and incentivize domestic nuclear security champions in these countries.

This memo outlines lessons about challenges from past nuclear security cooperation and outstanding issues that the United States, Russia, and China still need to address. It also identifies options for action for strengthening US cooperation with Russia and China, respectively, and for strengthening nuclear security overall.

Lessons From Past Nuclear Security Cooperation

In Russia, cooperation to date has focused largely on US financing and inspection of Russian designed and installed improvements to security and accounting equipment at nuclear sites. It also has included training, regulatory development, improving security culture, ensuring sustainability, exchanging best practices, and consolidating and eliminating highly enriched uranium (HEU). In China, where cooperation has been more limited, the focus has been on workshops and best-practices exchanges rather than upgrades of security systems.

Those involved in the cooperative efforts have learned important lessons about what is and is not effective for security. Participants discussed the following lessons:

- Effective security is 80 percent culture and 20 percent equipment, as one participant put it (referencing a quote by Gen. Eugene Habiger).
- Ensuring that security is sustainable—through budgetary support, regulatory oversight, clear incentives, and regular assessment and testing—is key.
- Differing contextual cultures and comparative advantages between organizations and countries must be taken into account.
- Effective security is not a stable end state or a job that is “done” at a particular moment, but rather requires continuous striving for excellence.
- Strong support from political authorities, including setting benchmarks and deadlines and identifying officials responsible for overseeing progress, contribute to maintaining momentum.
- Trust and personal relationships between cooperating experts and operators are indispensable.
- It is possible to share security best practices without disclosing sensitive information.

Cross-Cutting Issues

Participants agreed that the basic purpose of nuclear security cooperation is for states to achieve effective and sustainable security for all nuclear weapons and weapons-usable materials (and any other facilities and materials they consider important to protect). A goal of effective and sustainable security should be for states to protect all nuclear weapons and weapons-usable materials against the full range of threats that their intelligence assessments deem to be credible.

Participants concluded that a number of mechanisms for cooperation are useful for different purposes. In particular, centers of excellence have significant potential as locations where a variety of discussions, training, best-practice exchanges, and testing can occur, and as potential champions for strengthened nuclear security. Participants also agreed that some of the components of effective nuclear security were a strong security culture, a roadmap indicating how security practices fit together, and providing assurances of effective security.

Participants discussed the role of visits to actual nuclear sites in cooperation. In US-Russian cooperation, the United States has often insisted on such visits to ensure that US-funded work had been done as agreed. Participants also described the value of the on-the-ground feel for the situation at a facility and of discussions with facility staff (including in identifying additional

issues and vulnerabilities to be addressed). There was general agreement, however, that the current political environment in Russia made these visits difficult. Some participants thought a more reciprocal approach, in which Russian experts would get similar access to US facilities, might be more politically acceptable, while others argued the US government should downplay the site-access question in US-Russian discussions until overall relations improve. Participants agreed that if the only need was to confirm that equipment had been installed as agreed by the United States and Russia, various nonaccess assurances might be effective.

In China, cooperation so far has only involved a few visits to sites with weapons-usable material. Most participants expected that to continue, with a great deal of the cooperation focusing on the Chinese Center of Excellence, but some argued that expanded site visits would be useful and should be pursued, perhaps starting with nonsensitive sites.

In both cases, participants agreed that there should be engagement on nuclear security at the political, organizational, and working levels, although different types of cooperation warrant engagement with each of these constituencies at different times. Finally, participants identified a number of bilateral, multilateral, and informal mechanisms for encouraging cooperation. These included the Global Initiative to Combat Nuclear Terrorism, the UK-US-Russia trilateral discussions, the P5 process, universities, and expert conferences.

Russia

For twenty years, the United States has supported upgrades for nuclear security in Russia. Over that time, the effectiveness of nuclear security in Russia has improved dramatically, though some significant weaknesses remain. Current contracts for US-funded nuclear security upgrades in Russia will expire at the end of 2014, and because of the conflict in Ukraine, broader political differences, and long-standing unresolved issues related to nuclear security cooperation between the two countries, Russia will likely decline to extend them or enter into new contracts. Both countries need to take a cooperative, problem-solving approach to avoid having all cooperation come to an end.

The two countries can still benefit from cooperation with each other, including sustaining security upgrades at nuclear facilities, strengthening security culture, strengthening regulations and enforcement, augmenting protection against insider threats, and exchanging best practices.

To ensure that nuclear security cooperation continues, the United States and Russia will need to find new ways of working together based on a more equal partnership. Some ways to do this include:

- Continuing workshops and best-practice exchanges. These have proven to be very useful in exploring issues such as insider protection, vulnerability assessment, design basis threat methodology, performance testing, and more. They can also sustain relationships among US and Russian nuclear security experts.
- Continuing work on strengthening regulations, building security culture, and providing training. A number of participants emphasized the value of each of these areas. Though a few participants argued that regulations and standards rarely lead to good security, others

argued that effective regulation is essential to sustainability, as most nuclear managers will not invest in expensive security measures unless required to do so.

- Continuing work on conversion of HEU-fueled research reactors.
- Engaging in joint nuclear security research and development projects, which could develop new technologies and approaches useful to both sides and might create opportunities to visit sites where the work is being done.
- Seeking agreement on joint work in third countries.
- Exploring possibilities for reciprocal experts' consultations at nuclear sites.
- Furthering cooperation on preparedness for emergency response.

Participants discussed a variety of approaches that might make agreement on such continued cooperation and successful implementation more likely. These included:

- A genuinely equal approach, with ideas and resources from both sides, and both sides playing a central part in the conversation about what needs to be done to strengthen security and why.
- Expanded efforts to build understanding of the threat, including through documenting real cases where thieves or terrorists overcame security measures (both at nuclear and nonnuclear facilities).
- Resuming US-Russian cooperation on nuclear energy, nuclear safety, and fundamental science, and embedding nuclear security in that broader rubric (as well as building relationships through that other cooperation).

Several participants questioned the viability of the US approach of cutting off cooperation Russia favors (such as in nuclear energy and science) while hoping Russia will continue cooperation the US favors (such as in nuclear security).

China

Although the scope of US-Chinese cooperation has been more limited, the United States and China have actively engaged in civilian nuclear cooperation for more than a decade, particularly on nuclear security in civilian facilities and organizations. Over that period, the quality of nuclear security in China has improved significantly. Participants agreed that nuclear security cooperation between the United States and China has been successful, but there is a lot more the two countries could accomplish.

To date, most Chinese experts have not seen nuclear terrorism as a serious risk to China. But with increased domestic terrorism, increased corruption, and China's rising global role, some Chinese analysts are expressing concern about nuclear and radiological terrorism dangers. Participants thought that demonstrating strong nuclear security was one way for China to show leadership and its role as a responsible stakeholder while simultaneously improving its relationship with the United States.

Although the ultimate goal for nuclear security cooperation should be for the two countries to work together on improving civilian and military nuclear security, there is more of a gap in understanding the security of Chinese nuclear weapons and nuclear material for military purposes.

Participants identified the following possibilities for nuclear security cooperation between the United States and China:

- Strengthening the Design Basis Threat (DBT) in China. China should establish at least a minimum national-level DBT, as local sites may not have the threat information needed to develop appropriate DBTs.
- Updating old and outdated regulations.
- Best-practice exchanges, technical cooperation, and research and development projects through the Chinese Center of Excellence. (Participants argued that rather than trying to explicitly restart cooperation labeled “lab-to-lab,” participants from US and Chinese labs could take part in projects and discussions through the Chinese Academy of Engineering.)
- Continued cooperation through the Chinese Atomic Energy Authority, in which Chinese participants in the military and civilian sectors can take part.
- Identifying what worked with nuclear security cooperation in Russia and applying it to cooperation in China.
- Improving security at bulk processing facilities.
- Identifying opportunities for strengthening military nuclear security between the United States and China.

Recommendations for Strengthening Nuclear Security Cooperation in Both Countries

The following recommendations could be applied to nuclear security in the United States, Russia, China, or any facility with nuclear weapons or weapons-usable material. Participants looked at best practices, security culture, insider threats, and sustainability.

1. Best Practices for Effective Regulation, Inspection, Testing and Assessment
 - **Work to ensure states appropriately require operators to protect against the full spectrum of plausible threats** and have appropriate approaches to vulnerability assessment and performance testing (including force-on-force exercises) to ensure that those performance objectives are being met.
 - **Create a pilot project or best-practices exchange** to understand the balance between performance-based and compliance-based regulations and identify proposals for broad implementation.
 - **Develop performance-testing tools and practices** that take into account not only physical protection against outsider threats but also protection against insider threats, including materials control and accounting.
 - **Consider activities for building regulatory capacity** to inspect, enforce, and educate, including possibly a systemic process to share regulatory best practices.
2. Strategies for Creating a Strong Security Culture
 - **Establish comprehensive security-culture programs** in which each operator handling nuclear weapons or weapons-usable material has a program in place to assess and improve its security culture.

- **Provide constant and continual messaging from top institutional and political levels** emphasizing that security is an important enterprise, reinforcing a culture of continuous improvement, and engaging everyone within the organization.
- **Develop techniques to effectively motivate people** by giving them a sense of purpose. This includes developing incentives for good behavior; helping people realize that security is empowering to the mission, not detrimental; encouraging feedback and participation in improving security; and encouraging ongoing discussions.
- **Provide training** for everyone, but especially managers who should be the security role models for the entire nuclear enterprise. Trainings should show that security training teaches skills that contribute to the health of the entire nuclear enterprise.
- **Design security culture programs so that they engage the enterprise as a whole.** The nuclear enterprise should have someone at the senior level who is responsible for reporting on the nuclear security program; for private companies, the board of directors should be regularly informed and take responsibility for overseeing an effective program.
- **Share best practices** between facilities or countries on a bilateral or multilateral basis. Centers of excellence are one mechanism for sharing information in this area.
- **Understand and accept individual security responsibility.**

3. Approaches to Effective Protection Against Insider Threats

- **Conduct background checks and psychological testing** on employees who will have access to sensitive equipment, material, or facilities.
- **Provide protection and incentives for employees** who report suspicious activities.
- **Establish disgruntlement-mitigation programs and employee-assistance programs.** Research indicates that low-cost approaches in which managers listen to, validate, and empathize with employees who have complaints greatly reduce employee disgruntlement. Employee-assistance programs can help employees who are beginning to have mental health issues and, by framing reporting as helping a colleague, can encourage employees to report behavior that may indicate an issue.
- **Provide briefings and training** that ensures that those involved in nuclear security have a realistic picture of the threat (including of potential insider adversaries).
- **Ensure that material control and accounting** systems are effective enough to be able to detect and localize the loss of a significant quantity of nuclear material.
- **Use and improve research-based practices** to ensure that the latest strategies and techniques for security are being applied.

4. Ideas for Incentivizing Sustainable Security at the Operator and State Level

- **Work with members of the Nuclear Suppliers Group** to persuade other participants to carry out visits to confirm that recipients have adequate physical protection in place, as the United States does.
- **Create an overarching standard** designed to help organizations ensure they are using best practices for nuclear security (similar to the ISO 9000 series for quality). This could allow a variety of incentives to be targeted to certified firms, from lower insurance rates to preferential procurement from them.
- **Create rewards for finding vulnerabilities** and proposing means to fix them, rather than ignoring or punishing people within organizations who speak up about vulnerabilities.
- **Establish graded security requirements** so that sites that eliminated their weapons-usable material or held it in much less attractive forms would have reduced security costs, giving them incentives to move in that direction.

Looking Ahead

Establishing effective and sustainable nuclear security is essential for reducing the risk of nuclear terrorism, but this is not something countries can do alone. Despite the great deal of uncertainty about the future of nuclear security cooperation between the United States and Russia, there is still significant work the two countries can do together. Similarly in China, there are many opportunities for cooperation in strengthening nuclear security. Ensuring that cooperation continues in any of these countries will require continuous engagement and support at the site, organization, and national levels.

Additional information about this roundtable and others held as a part of the 55th annual Strategy for Peace Conference is available on our Web site: www.stanleyfoundation.org/events.cfm?id=487.

This brief summarizes the primary findings of the roundtable as interpreted by rapporteur Nickolas Roth. The roundtable was chaired by Matthew Bunn and organized by Anya Loukianova.

The analysis and recommendations included in this Policy Memo do not necessarily reflect the view of the Stanley Foundation or any of the conference participants, but rather draw upon the major strands of discussion put forward at the event. Participants neither reviewed nor approved this document. Therefore, it should not be assumed that every participant subscribes to all of its recommendations, observations, and conclusions.

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