

# Do as I Say, and as I Do: Chinese Leadership in Nuclear Security

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## **Abstract**

This paper analyzes China's words and actions regarding the Nuclear Security Summits to better understand what Chinese leadership on nuclear security could look like in the future. It finds that China accomplished the many things it said it would do during the summit process. The paper also explores how China's policy and actions in other nuclear arenas could be paired with Chinese nuclear security policy to form a coherent agenda for nuclear risk reduction writ large. Consequently, the paper addresses how China doing as it says and does – per nuclear security – may be used as a way in which to inform its future nuclear security roles and responsibilities. In particular, it assesses China's opportunities to assume a leadership role within this crucial international security issue area, especially at a time where U.S. leadership has waned.

## Introduction

Since 2010, China has paid an increasing amount of attention to the challenge of preventing nuclear and radiological terrorism. This is in large part due to the Nuclear Security Summits, a process initiated by U.S. President Barack Obama, which began in 2010 and culminated in 2016, bringing together more than 50 world leaders at four summits to consolidate and enhance efforts to reduce the risk of nuclear radiological terrorism. Chinese President Xi Jinping and his predecessor Hu Jintao actively participated in all four Nuclear Security Summits, pledging to strengthen nuclear security, not only for China, but globally.

By way of example, in 2014, President Xi emphasized that nuclear security should be an important element in China's national security strategy.<sup>1</sup> Since the summits, China has been actively working on introducing new national laws and regulations related to nuclear security. Before the final 2016 Nuclear Security Summit concluded, China established a Center of Excellence (COE) on Nuclear Security in Beijing, a joint project with the United States, initiated at the first Nuclear Security Summit in 2010. The COE was created in order to strengthen capacity inside of China for preventing nuclear terrorism and to provide a regional hub for the promotion and training of best practices related to nuclear security.

As a result of the summits, China has made important progress on nuclear security domestically having committed to improving its national nuclear security system and strengthening the international nuclear security architecture. In particular, China has made significant progress in various nuclear security initiatives, including:

- the construction and operation of its national COE on Nuclear Security;
- strengthening management of nuclear and radioactive materials;
- combating illicit trafficking of nuclear materials;
- enhancing nuclear emergency response capability;
- improving nuclear cyber security; and
- establishing a radiation environment monitoring system.<sup>2</sup>

On the international scene, China played an instrumental role in removing nuclear material from Nigeria in late 2018 in response to concerns about the potential for the Nigerian terrorist group Boko Haram to access it. The team of international experts removed the highly enriched uranium from a Nigerian research reactor (which Nigeria had built with technical support and backing from China), with China playing a key role in transporting and storing the uranium. Moving the nuclear material out of Nigeria had been a long-sought-after goal of the United States and global

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<sup>1</sup> Referenced in Hui Zhang, "China's Nuclear Security: Progress, Challenges, and Next Steps," Cambridge, Mass: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, March 2016: <https://www.belfercenter.org/sites/default/files/legacy/files/Chinas%20Nuclear%20Security-Web.pdf>

<sup>2</sup> Chong Liu, "Pressing Global Nuclear Security Problems and China's Response," NAPSNet Special Reports, October 13, 2017: <https://nautilus.org/napsnet/napsnet-special-reports/pressing-global-nuclear-security-problems-and-chinas-response/>

nuclear nonproliferation efforts. Once the material arrived in China, local officials took possession of the uranium.<sup>3</sup>

China's consistent efforts to strengthen nuclear material security at home and abroad, and its pledge to fulfill its Nuclear Security Summits commitments over the coming years raise the possibility that China could play a leading role in global nuclear risk reduction efforts in the coming decades. The Trump Administration's efforts to undermine nuclear arms control and its neglect for nuclear nonproliferation and security only increases this leadership opportunity for China. Questions abound, however, about the potential direction of nuclear risk reduction efforts under Chinese leadership: What do recent Chinese nuclear security efforts reveal about how China would approach setting the agenda for additional nuclear security policy making? And, how is China's approach likely to evolve in the coming decade as (1) arms control becomes less prominent, (2) China becomes a larger exporter of nuclear technology and materials, and (3) China asserts its own priorities in other fora, including the Nuclear Non-Proliferation Treaty (NPT) Review Conference and the Nuclear Suppliers Group (NSG)?

China was fairly successful in accomplishing the many things it said it would do throughout the entire summit process. Along with its progress on nuclear security, China has also asserted specific policies on nuclear nonproliferation, including within the export control regime, and civilian nuclear cooperation that suggest Chinese leadership within the broader global nuclear risk reduction system would prioritize cooperation, engagement, and positive inducements especially when the political, military, and economic benefits outweigh the costs and risks from the Chinese point of view.<sup>4</sup> Even though the United States and others may be generally pleased with Chinese strides in nuclear security, they are frustrated by China's continued efforts to modernize its nuclear weapons forces in order to maintain minimum deterrent capabilities, and this frustration has made further collaboration on nuclear security—and all nuclear policy issues—difficult.

This paper analyzes China's words and actions regarding the Nuclear Security Summits to begin to understand what Chinese leadership on nuclear security could look like in the future. It finds that China was relatively upfront about its goals in engaging in the summit process. It also explores how China's policy and actions in other nuclear arenas could be paired with Chinese nuclear security policy to form a coherent agenda for nuclear risk reduction at large.

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<sup>3</sup> Aaron Mehta, "How the US and China collaborated to get nuclear material out of Nigeria – and away from terrorist groups," *Defense News*, January 14, 2019: [https://www.defensenews.com/news/pentagon-congress/2019/01/14/how-the-us-and-china-collaborated-to-get-nuclear-material-out-of-nigeria-and-away-from-terrorist-groups/?utm\\_source=Sailthru&utm\\_medium=email&utm\\_campaign=Exclusive%201.14.19&utm\\_term=Editorial%20-%20Breaking%20News](https://www.defensenews.com/news/pentagon-congress/2019/01/14/how-the-us-and-china-collaborated-to-get-nuclear-material-out-of-nigeria-and-away-from-terrorist-groups/?utm_source=Sailthru&utm_medium=email&utm_campaign=Exclusive%201.14.19&utm_term=Editorial%20-%20Breaking%20News)

<sup>4</sup> Nancy Gallagher, "China on Arms Control, Nonproliferation, and Strategic Stability," CISSM Working Paper, August 2019: [https://cisssm.umd.edu/sites/default/files/2019-08/China%20on%20Arms%20Control%2C%20Nonproliferation%2C%20and%20Strategic%20Stability\\_082619\\_0.pdf](https://cisssm.umd.edu/sites/default/files/2019-08/China%20on%20Arms%20Control%2C%20Nonproliferation%2C%20and%20Strategic%20Stability_082619_0.pdf): 30.

## The Nuclear Security Summits

The Nuclear Security Summits, initiated by U.S. President Barack Obama in April 2009 and concluded in April 2016, strengthened the global nuclear security architecture and brought high-level political attention to the risk posed by nuclear terrorism. The process brought together more than 50 world leaders at four summits—Washington, D.C. (2010), Seoul (2012), the Hague (2014), and Washington D.C. (2016)—to consolidate and enhance efforts to reduce the risk of nuclear and radiological terrorism. The summits sought to achieve these goals by encouraging the strengthening of national laws, bolstering international cooperation, and minimizing the use of weapons-usable materials.

The summits pioneered the use of regular and voluntary nuclear security commitment-making by states and groups of states, leading to the creation of a new tool for continuously improving the nuclear security regime. The objective of strengthening nuclear security measures through independent or coordinated national action was enshrined at the 2010 Nuclear Security Summit, and each subsequent summit brought new, specific national commitments to address gaps in the nuclear security system. In addition to the many voluntary pledges made by single countries to improve nuclear security—known as “house gifts”—groups of states came together to make multilateral commitments—known as “gift baskets/joint statements.” These gift baskets allowed states to address key areas of nuclear security concern and move beyond the status quo. In total, countries made more than 935 distinct commitments to strengthen and improve nuclear security throughout the six-year process.<sup>5</sup> The total number of commitments per state offered over the four summits ranged from 8 to 30, with an average of 18 per state. These voluntary national commitments resulted in some of the most tangible and innovative nuclear security improvements.

For example, these commitments resulted in the recovery and elimination of nuclear materials such that today, only 22 countries in the world—down from more than 50—have weapons-usable nuclear materials on their territories. Over the course of the summits, at least eight participating states eliminated stockpiles of weapons-usable materials, leaving three entire geographic regions—South America, Southeast Asia, and Central and Eastern Europe—entirely clear of highly enriched uranium.

In addition to the critical work to minimize and secure nuclear materials, nearly three dozen states (including China) met national commitments to pass new laws or update existing regulations to strengthen nuclear security. Countries also created more than 20 new nuclear security centers to enhance training and culture development, enhanced monitoring for nuclear and radioactive sources at borders, and ensured adequate cyber security at nuclear facilities.<sup>6</sup>

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<sup>5</sup> Sara Z. Kutchesfahani, Kelsey Davenport, and Erin Connolly, “The Nuclear Security Summits: An Overview of State Actions to Curb Nuclear Terrorism 2010-2016,” An Arms Control Association and Fissile Materials Working Group Report, July 2018: [https://armscontrolcenter.org/wp-content/uploads/2018/07/NSS\\_Report2018\\_final.pdf](https://armscontrolcenter.org/wp-content/uploads/2018/07/NSS_Report2018_final.pdf)

<sup>6</sup> Sara Z. Kutchesfahani and Kelsey Davenport, “Why countries still must prioritize action to curb nuclear terrorism,” *Bulletin of the Atomic Scientists*, August 3, 2018: <https://thebulletin.org/2018/08/why-countries-still-must-prioritize-action-to-curb-nuclear-terrorism/>

Another accomplishment of the Nuclear Security Summit process was the entry into force of a treaty that sets binding requirements for the physical protection of nuclear materials: the 2005 Amendment to the Convention on Physical Protection of Nuclear Material (CPPNM/A). During the Summit process, the number of countries to have ratified the treaty increased five-fold, reaching the 101 countries needed for the amendment to enter into force.<sup>7</sup> A similar uptick was seen in the number of new adherents to the International Convention on Suppression of Acts of Nuclear Terrorism (ICSANT)—a 2005 UN Treaty designed to criminalize acts of nuclear terrorism. Summit documents encouraged states to take action to ratify these key treaties, and many states pledged to accede to both during the Summit process—including China.<sup>8</sup> As a result of ratifying these agreements, China (along with many other Nuclear Security Summit participant states) updated national laws and regulations to align with the treaty standards.

Perhaps the most impactful gift basket to have come out of the Summit process was the strengthening nuclear security implementation initiative (SNSI)—also known as INFCIRC/869. In this statement, 36 countries pledged to incorporate the intent of the primary IAEA nuclear security guidance documents into their national regulations, essentially making these voluntary guidelines binding at the national level. This statement attracted critical new adherents at the 2016 Nuclear Security Summit, including China and India. By joining the initiative, China committed to achieve the objectives of the IAEA nuclear security recommendations and accept peer reviews of its nuclear security arrangements.<sup>9</sup> When the joint statement was initially introduced in 2014, China did not join the pledge because of Beijing’s concerns about disclosing sensitive information.<sup>10</sup> Yet, two years later, China joined the initiative, strengthening its commitment to nuclear security. It is unclear whether China’s participation in the summits reduced its concerns about transparency or whether Chinese officials determined that the benefit to China’s international image of participation outweighed these concerns.<sup>11</sup>

## China’s Nuclear Security Efforts

Chinese participation in the Nuclear Security Summits was motivated by three factors. First, the invitation to participate in the summits was a likely determining factor to attend, given that not all countries with nuclear weapons and/or nuclear energy programs were invited to participate in the summits. Second, Chinese President Hu Jintao had a phone conversation with U.S. President Barack Obama days before the first summit in which he stated that China attaches great importance to the issue of nuclear security, opposes nuclear proliferation and nuclear terrorism,

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<sup>7</sup> Of the summit participants, 29 countries ratified the CPPNM/A during the summit process compared to 18 countries pre 2010, while 24 countries ratified ICSANT compared to 23 countries pre 2010.

<sup>8</sup> While China had already signed the Convention on Physical Protection of Nuclear Materials prior to the Nuclear Security Summit process in 1989 and its 2005 Amendment in 2009, it signed the International Convention on Suppression of Acts of Nuclear Terrorism in August 2010 – four months after the first Nuclear Security Summit.

<sup>9</sup> Matthew Bunn, “*The Nuclear Security Summit: Wins, Losses, and Draws.*” *Nuclear Security Matters*, April 4, 2016: <https://www.belfercenter.org/publication/nuclear-security-summit-wins-losses-and-draws>

<sup>10</sup> Hui Zhang, “Why China should observe the Nuclear Security Summit pledge,” *Bulletin of the Atomic Scientists*, April 21, 2014: <https://thebulletin.org/2014/04/why-china-should-observe-the-nuclear-security-summit-pledge/>

<sup>11</sup> Zhang, “Why China should observe the Nuclear Security Summit pledge”; Gallagher, “China on Arms Control, Nonproliferation, and Strategic Stability”: 5.

and supports international efforts to enhance cooperation on nuclear security.<sup>12</sup> Third, as some Chinese experts have noted, since the threat of nuclear terrorism is a top priority in Washington, Beijing believed its participation would benefit the Sino-U.S. relationship.<sup>13</sup>

Its participation and contributions to the Summits also played into China's long-standing self-perception as the most responsible of the major nuclear powers.<sup>14</sup> Indeed, China has joined nearly all international legal instruments relevant to nuclear security (see Figure 1), and the obligation to fulfill the many requirements of these instruments has been the major driver of improvements to Chinese nuclear security capabilities.<sup>15</sup> In fact, since the first Nuclear Security Summit in 2010, China has drafted a relatively complete set of nuclear security policies, implemented a series of laws and regulations that meet international standards, and established a fairly complete nuclear security management, monitoring, and emergency response system.

### **FIGURE 1: China's International (and National) Nuclear Security Legal Commitments**

#### ***Pre Nuclear Security Summits (2010):***

- In 1989, China acceded to the 1980 Convention on the Physical Protection of Nuclear Material (CPPNM). In 2009, it ratified the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM/A).
- In 2007, China began contributing to the Incident and Trafficking Database (ITDB), the IAEA's information system on incidents of illicit trafficking and other unauthorized activities and events involving nuclear and other radioactive material outside of regulatory control.

#### ***Post Nuclear Security Summits (since 2010):***

- In August 2010, China ratified the International Convention for the Suppression of Acts of Nuclear Terrorism, a 2005 UN Treaty designed to criminalize acts of nuclear terrorism.
- In July 2015, China issued a new National Security Law (the first of its kind), calling for "ensuring citizens' safety from the threat of nuclear and nuclear attacks and accident hazards" by "strengthening management, oversight and protection of nuclear materials, nuclear activities, and disposal of nuclear waste," and by "increasing the capacity to respond to nuclear incidents."<sup>16</sup>
- In December 2015, China issued a new National Counter Terrorism Law, which provides the basis for strengthening implementation and enforcement of measures for preventing nuclear

<sup>12</sup> "Hu arrives in Washington for nuclear security summit," *China Daily*, April 12, 2010:

[http://www.chinadaily.com.cn/china/2010-04/12/content\\_9718897.htm](http://www.chinadaily.com.cn/china/2010-04/12/content_9718897.htm)

<sup>13</sup> Zhang, "China's Nuclear Security: Progress, Challenges, and Next Steps": 5.

<sup>14</sup> Zhang, "Why China should observe the Nuclear Security Summit pledge"; Gallagher, "China on Arms Control, Nonproliferation, and Strategic Stability": 5.

<sup>15</sup> Hui Zhang and Tuosheng Zhang, "Securing China's Nuclear Future," Cambridge, Mass: The Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard University, March 2014:

<https://www.belfercenter.org/sites/default/files/legacy/files/securingchinasnuclearfutureenglish.pdf>: 28.

<sup>16</sup> Zhang, "China's Nuclear Security: Progress, Challenges, and Next Steps": 11.



terrorism in China.<sup>17</sup> In January 2016, China issued a White Paper outlining an effective system for nuclear emergency response—China’s first-ever White Paper in the nuclear safety and security area. Chinese analysts have noted that the White Paper was influenced by the Nuclear Security Summits and the Fukushima nuclear accident.<sup>18</sup>

- In January 2016, China issued a White Paper outlining an effective system for nuclear emergency response – China’s first-ever White Paper in the nuclear safety and security area. Chinese analysts have noted that the White Paper was influenced by the Nuclear Security Summits and the Fukushima nuclear accident.<sup>19</sup>
- In March 2016, China established an International Center of Excellence on Nuclear Security to strengthen capacity inside of China for preventing nuclear terrorism and to provide a regional hub for the promotion of best practices in the field.
- In April 2016, China joined the strengthening nuclear security implementation initiative (SNSI) – also known as INFCIRC/869. By signing on to INFCIRC/869, China pledges to follow IAEA nuclear security principles and guidelines in its national rules and regulations, and allow teams of international experts to periodically evaluate its security procedures.<sup>20</sup>
- In 2016, China published a draft of strengthened nuclear security regulations, which would establish a national-level Design Basis Threat (DBT) for the first time, replacing a previous system in which each operator developed its own DBT for review by regulators.<sup>21</sup>
- In August 2017, China received an IAEA International Physical Protection Advisory Service (IPPAS) mission. The 2-week mission was the 77<sup>th</sup> IPPAS mission conducted by the IAEA since the program began in 1995; China was the 48<sup>th</sup> Member State to host an IPPAS mission.<sup>22</sup>
- In September 2018, China drafted an Atomic Energy Law, which promotes the export of nuclear power, nuclear fuel, and related equipment and technical services, placing strict limits on the exports of proliferation-sensitive items and dual-use materials.<sup>23</sup>
- Over the years, China has contributed to the IAEA Nuclear Security Fund, a voluntary funding mechanism that helps implement the IAEA Nuclear Security Plan. By the end of 2015, China donated \$1.15 million to the fund (and will give positive considerations to increasing the annual amount of donation, and will continue to donate nuclear security equipment developed by China).<sup>24</sup>

<sup>17</sup> *Ibid.*

<sup>18</sup> *Ibid.*

<sup>19</sup> *Ibid.*

<sup>20</sup> Hui Zhang, “China Makes Significant Nuclear Security Pledges at 2016 Summit,” *Nuclear Security Matters*, April 8, 2016: <https://www.belfercenter.org/publication/china-makes-significant-nuclear-security-pledges-2016-summit>

<sup>21</sup> Matthew Bunn, Nickolas Roth, and William H. Tobey, “Revitalizing Nuclear Security in an Era of Uncertainty,” Cambridge, Mass: Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard Kennedy School, January 2019: [https://www.belfercenter.org/sites/default/files/2019-03/RevitalizingNuclearSecurity\\_Mar19.pdf](https://www.belfercenter.org/sites/default/files/2019-03/RevitalizingNuclearSecurity_Mar19.pdf): 54.

<sup>22</sup> IPPAS missions from the IAEA Office of Nuclear Security are intended to help States strengthen their national nuclear security regime. The missions provide peer advice on implementing international instruments, along with IAEA guidance on the protection of nuclear and other radioactive material and associated facilities. The mission makes necessary recommendations to strengthen its protections in accordance with international guidelines and best practices. Countries must invite the IAEA to conduct such missions, and follow-up visits sometimes occur after security has been strengthened. IPPAS missions are conducted both on a nationwide and facility-specific basis. See: IAEA, “IAEA Completes Nuclear Security Advisory Mission in China,” IAEA News Center, September 8, 2017: <https://www.iaea.org/newscenter/pressreleases/iaea-completes-nuclear-security-advisory-mission-in-china>

<sup>23</sup> World Nuclear News, “Draft Law Supports Chinese Nuclear Exports,” *World Nuclear News*, September 24 2018: <http://www.world-nuclear-news.org/Articles/Draft-law-supports-Chinese-nuclear-exports>

<sup>24</sup> National Progress Report: China, March 31, 2016: <http://www.nss2016.org/document-center-docs/2016/3/31/national-progress-report-china-1>



Most of China’s ongoing nuclear security activities also stem from the Summit process. Figure 2 provides an overview of Chinese accomplishments during the course of the Summits from April 2010 through April 2016. It strives to include all Chinese nuclear security actions, but, given the inherent limitations on information availability, it is not exhaustive.

The information presented in Figure 2 was primarily drawn from Chinese national progress reports at the 2012, 2014, and 2016 Summits.<sup>25</sup> China issued at least one voluntary report at each summit detailing how it was implementing its nuclear security responsibilities. There is substantial variation in what countries included in their progress reports, because states were unable to agree on a common reporting form. However, many reports, including the Chinese reports, grew in length and scope over time, detailing the state’s national security regime and how it interacts with the international system. The increased length of the Chinese reports (see Table 1) indicate Beijing’s increased and evolving interest in nuclear security. Many national progress reports, including China’s, included information about activities related to nuclear safety and nonproliferation.

**TABLE 1: Length of China’s Progress Reports to the Nuclear Security Summits: 2010-2016**<sup>26</sup>

Date of Nuclear Security Summit	Number of Pages	Number of Words
2012 (Seoul)	2	968
2014 (The Hague)	4	1494
2016 (Washington, D.C.)	5	2358

Participation in nuclear security initiatives prior to the Summits is not listed in Figure 2, even though China included details about involvement in these mechanisms in their progress reports.<sup>27</sup> For example, China noted participation in the International Atomic Energy Agency’s Incident and Trafficking Database, but that is not reflected in Figure 2 as it is meant to highlight actions taken during – rather than before – the summit process.

<sup>25</sup> China Nuclear Security Summit 2012 National Progress Report (May 2012): [https://nuclearsecuritymatters.belfercenter.org/sites/default/files/legacy/files/nuclearmatters/files/china\\_-\\_national\\_progress\\_report.pdf](https://nuclearsecuritymatters.belfercenter.org/sites/default/files/legacy/files/nuclearmatters/files/china_-_national_progress_report.pdf); China Nuclear Security Summit 2014 National Progress Report (March 2014): [http://projects.iq.harvard.edu/files/nuclearmatters/files/national\\_progress\\_report\\_china.pdf](http://projects.iq.harvard.edu/files/nuclearmatters/files/national_progress_report_china.pdf); China Nuclear Security Summit 2016 National Progress Report (March 2016): <http://www.nss2016.org/document-center-docs/2016/3/31/national-progress-report-china-1>

<sup>26</sup> China Nuclear Security Summit 2012 National Progress Report; China Nuclear Security Summit 2014 National Progress Report; China Nuclear Security Summit 2016 National Progress Report.

<sup>27</sup> *Ibid.*

**FIGURE 2: Chinese Nuclear Security Commitments and Actions: 2010-2016<sup>28</sup>**

**Progress on Nuclear and Radiological Security**

- Upgraded security for radioactive sources (2012)
- Converting mini research reactors in China and of Chinese origin from HEU to LEU (2012, 2014, 2016)
- Nigeria, with cooperation from the United States, China, and the IAEA, converted a research reactor from HEU to LEU (2012, 2016)
- Decommissioned two HEU research reactors (2014)
- Conducted a national comprehensive examination on the safety and security of radioactive sources and radioactive materials in transport (2014)
- Completed construction of radioactive waste repositories and the national storage center for spent radioactive sources (2014)
- Continued construction on the National Base for Research and Development of Nuclear and Radiological Safety and Security Monitoring Technologies (2016)
- Completed conversion of Ghana's HEU research reactor and repatriated all HEU fuel to China in 2017 (2016)
- Conducted security inspections of over 15,000 users of radioactive sources (2016)

**Progress on Counter Nuclear and Radiological Smuggling**

- Developed new equipment to detect radioactive substances, used for border monitoring and securing major international events (2012)
- Expanded Megaports initiative to Yangshan port (2012, 2014)
- Established the China Customs Training Center for Radiation Detection and held trainings (2012, 2014, 2016)<sup>29</sup>
- Established a national radioactive source database (2014)
- Held a national-level nuclear security exercise (2014)
- Installed more than 1,000 radiation detection units at gateway ports (2014, 2016)
- Implemented the latest nuclear export control list (2016)

**Progress on Education and Training Initiatives**

- Held training courses on nuclear security in cooperation with IAEA (2010, 2012, 2014)
- Established a Center of Excellence on Nuclear Security (2010, 2012, 2014, 2016)<sup>30</sup>

<sup>28</sup> Kutchesfahani, Davenport, Connolly, "The Nuclear Security Summits: An Overview of State Actions to Curb Nuclear Terrorism 2010-2016."

<sup>29</sup> The Training Center serves as a dedicated training facility for custom officials and improve China's counter-nuclear smuggling and terrorism capabilities: Michelle Cann, Kelsey Davenport, and Sarah Williams, "The Nuclear Security Summit: Progress Report", An Arms Control Association and Partnership for Global Security Report, July 2013: [https://www.armscontrol.org/files/Nuclear\\_Security\\_Summit\\_Report\\_2013.pdf](https://www.armscontrol.org/files/Nuclear_Security_Summit_Report_2013.pdf)

<sup>30</sup> At the 2010 Nuclear Security Summit, China announced it would establish a nuclear security Center of Excellence. In January 2011, the United States and China signed a Memorandum of Understanding for NNSA to work with China's Atomic Energy Authority on the center, which will promote effective nuclear security safeguards throughout Asia and act as a central site for the training of nuclear site personnel on measurement and accounting, protective force personnel development, and the design and installation of nuclear material security systems. The center serves as a place for exchanging best practices and technical information and help meet the training needs for developing countries. NNSA has committed to provide some equipment to the center and help develop its training programs and best practice exchanges: Michelle Cann, Kelsey Davenport, and Margaret Balza, "The Nuclear Security Summit: Assessment of National Commitments," Updated and Revised March 20, 2012, An Arms Control Association and Partnership for Global Security Report: <https://partnershipforglobalsecurity.org/wp->

- Cooperated with IAEA, Euratom, Australia, the Republic of Korea, and the United States to establish Japan's Integrated Comprehensive Support Center for Non-Proliferation and Nuclear Security (2010, 2012, 2014, 2016)<sup>31</sup>
- Trained nuclear regulatory personnel, including in cooperation with the United States (2014)
- Established a national a national base for R&D of nuclear and radiological safety and security monitoring technologies (2014, 2016)
- Established a national base for R&D of nuclear and radiological safety and security monitoring technologies (2014, 2016)
- Conducted a joint exercise with Russia on preventing illicit trafficking of nuclear and other radioactive materials (2016)

#### **Progress on Governance Structures and Processes**

- Signed Practical Agreement on Nuclear Security Cooperation with IAEA (2010)
- Implemented regulations developed by IAEA on safe management of radioactive waste (2012)
- Hosted an Asia-Pacific seminar to engage countries on the CPPNM/A (2014)
- Issued new radioactive waste regulations (2014)
- Included nuclear security, safety, and emergency management in Five-Year Period plans (2014)
- Updated domestic regulations, legislation, guidelines, and industry standards (2014)
- Drafted comprehensive national nuclear security regulations (2014, 2016)
- Passed a law clarifying nuclear security's role in national security and anti-terrorism (2016)
- Published a policy statement on nuclear security culture (2016)
- Established annual bilateral nuclear security dialogues with the United States (2016)
- Signed cooperation documents with the United States and Russia on preventing illicit trafficking of nuclear and other radioactive materials (2016)
- Issued a White Paper on China's emergency preparedness (2016)

#### **Participation in Joint Statements**

- Sustaining Action to Strengthen Global Nuclear Security Architecture (2016)
- LEU Fuel Bank (2016)
- Countering Nuclear Smuggling (2016)
- Implementation of UNSCR 1540 (2016)
- Cyber Security (2016)
- Nuclear Training and Support Centers (2016)
- US-China Joint Statement on Nuclear Security Cooperation (2016)

[content/uploads/2013/05/reports\\_the-nuclear-security-summit-assessment-of-national-commitments\\_3-13-12\\_cann-davenport-and-balza.pdf](#)

<sup>31</sup> Together with the IAEA, Euratom, Australia, the Republic of Korea, and the United States, China cooperated with the Japan Atomic Energy Agency (JAEA) on Japan's Integrated Comprehensive Support Center for Non-Proliferation and Nuclear Security. The JAEA, which is operating the center, hosted opening ceremonies in February 2011. The center aims to help emerging nuclear power countries develop tailored institutional infrastructure, provide human resources and capacity building support, and enhance international cooperation and coordination: <sup>31</sup> Robert Golan-Vilella, Michelle Marchesano, and Sarah Williams, "The 2010 Nuclear Security Summit: A Status Update," An Arms Control Association and Partnership for Global Security Report, April 2011: [https://www.armscontrol.org/system/files/Status\\_Report\\_April\\_11\\_2011\\_WEB.pdf](https://www.armscontrol.org/system/files/Status_Report_April_11_2011_WEB.pdf), Michelle Cann, "2010 Nuclear Security Summit National Commitment Implementation: Steps in the Fight Against Nuclear Terrorism," US-Korea Institute at SAIS, March 2012: [https://partnershipforglobalsecurity.org/wp-content/uploads/2013/05/reports\\_2012-nuclear-security-summit-national-commitment-implementation-steps-in-the-fight-against-nuclear-terrorism\\_3-1-12\\_cann.pdf](https://partnershipforglobalsecurity.org/wp-content/uploads/2013/05/reports_2012-nuclear-security-summit-national-commitment-implementation-steps-in-the-fight-against-nuclear-terrorism_3-1-12_cann.pdf)

This data is drawn from a July 2018 Arms Control Association and Fissile Materials Working Group report.<sup>32</sup> The figure's categories were developed by the authors of the report and do not reflect an official categorization of summit outcomes by China or other Summit participants. The dates at the end of each action reflect when China announced a commitment. For example, (2010) refers to the first Nuclear Security Summit held in Washington, D.C., (2012) refers to the second Nuclear Security Summit held in Seoul, South Korea, (2014) refers to the third Nuclear Security Summit held in The Hague, The Netherlands, and (2016) refers to the fourth and final Nuclear Security Summit held in Washington, D.C. If China referenced a commitment at multiple summits, each year is included.

The main focus of the Nuclear Security Summits was to elevate international leaders' concerns about the threat of nuclear terrorism in order to promote a sustained response. Chinese scholars argue that this is exactly what happened in the case of Chinese leaders. Though Chinese policy makers overlooked the issue of any act of nuclear terrorism occurring on Chinese soil prior to 2010, the Summit marked a turning point in Chinese political elite perceptions of the problem (see Figure 3).<sup>33</sup> Hui Zhang and Tuosheng Zhang explain:

Until the 2010 Nuclear Security Summit, except for the relevant functional departments of the Chinese government, the issue of nuclear terrorism was not well known by other sectors, including local governments, think tanks, industries, researchers in international affairs, the media, and the general public. Also, there was a lack of a sense of urgency in China to respond to the threat of nuclear terrorism.<sup>34</sup>

At the 2010 Summit, Chinese president Hu Jintao emphasized that “the potential threat of nuclear terrorism cannot be neglected and the risk of nuclear material diversion and illicit trafficking is on the rise.” He further proposed that “all countries need to honor their commitments and responsibilities by adopting effective measures to secure nuclear materials and facilities” for a variety of reasons:

Finding appropriate ways to tackle nuclear security challenges so as to ensure healthy and continuous development of nuclear energy and preserve international security and stability has become an important task that all countries share.<sup>35</sup>

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<sup>32</sup> Kutchesfahani, Davenport, Connolly, “The Nuclear Security Summits: An Overview of State Actions to Curb Nuclear Terrorism 2010-2016”. Please note that previous reports in the series were also consulted, including: Golan-Vilella, Marchesano, and Williams, “The 2010 Nuclear Security Summit”; Michelle Cann, “2010 Nuclear Security Summit National Commitment Implementation: Steps in the Fight Against Nuclear Terrorism,” US-Korea Institute at SAIS, March 2012: [https://partnershipforglobalsecurity.org/wp-content/uploads/2013/05/reports\\_2012-nuclear-security-summit-national-commitment-implementation-steps-in-the-fight-against-nuclear-terrorism\\_3-1-12\\_cann.pdf](https://partnershipforglobalsecurity.org/wp-content/uploads/2013/05/reports_2012-nuclear-security-summit-national-commitment-implementation-steps-in-the-fight-against-nuclear-terrorism_3-1-12_cann.pdf); Cann, Davenport, Balza, “The Nuclear Security Summit: Assessment of National Commitments”; Cann, Davenport, and Williams, “The Nuclear Security Summit: Progress Report”; Michelle Cann, Kelsey Davenport, and Jenna Parker, “The Nuclear Security Summit: Accomplishments of the Process,” An Arms Control Association and Partnership for Global Security Report, March 2016: <https://partnershipforglobalsecurity.org/wp-content/uploads/2018/02/nss-report-final.pdf>

<sup>33</sup> For a discussion about Chinese understanding regarding nuclear terrorism and how it may affect China, see Zhang, “China’s Nuclear Security: Progress, Challenges, and Next Steps”: 4–10.

<sup>34</sup> Hui Zhang and Tuosheng Zhang, “Securing China’s Nuclear Future,” Cambridge, Mass: The Project on Managing the Atom, Belfer Center for Science and International Affairs, Harvard University, March 2014: <https://www.belfercenter.org/sites/default/files/legacy/files/securingchinasnuclearfutureenglish.pdf>: 5.

<sup>35</sup> Ibid: 6.

To illustrate its commitment to the issue, at the 2010 Summit, China agreed to cooperate on the creation of a nuclear security center of excellence. The center would promote effective nuclear security safeguards throughout Asia and act as a central site for training nuclear personnel on measurement and accounting, protective force personnel development, and the design and installation of nuclear material security systems. The following January, the United States and China signed a Memorandum of Understanding to enable the U.S. National Nuclear Security Administration (NNSA) to work with China's Atomic Energy Authority to develop the center.<sup>36</sup> The NNSA committed to providing some of the center's equipment and to developing training programs and best practice exchanges.

The center opened in March 2016, with the capacity to train 2,000 nuclear security staff annually. It is the largest nuclear security center of excellence in the Asia-Pacific region. Its initial focus is on building domestic Chinese capacity, but it will eventually provide training for fellow nuclear security professionals from other countries in the region. Over time it aims to serve as a forum for bilateral and regional best practice exchanges and as a demonstration hub for advanced technologies.<sup>37</sup>

Though the establishment of the center was an important milestone, starting in 2010, nuclear security cooperation between China and the United States proceeded along a number of parallel tracks. The countries engaged on nuclear security matters through the Joint Coordinating Committee of the U.S.-China Peaceful Uses of Nuclear Technology Agreement in March 2011 and cooperated to install a radiation detection system at China's Yangshan port in December 2011 as part of the NNSA's Megaports Initiative.<sup>38</sup>

The second Summit in 2012 further focused China's attention on nuclear security and, by extension, nuclear terrorism. At the Seoul summit, President Hu acknowledged that since 2010,

Countries around the world have made good progress in promoting nuclear security. We have gained a better understanding of the importance of nuclear security, improved the relevant international legal framework and intensified international cooperation. As a result, the security conditions of nuclear materials and facilities have notably improved and our capacity for combating nuclear terrorism has significantly enhanced.

However, he also cautioned that:

The nuclear security situation remains grave. The destabilizing factors and uncertainties in the international arena are on the rise. The risks of nuclear material diversion and proliferation have increased. The threat of nuclear terrorism cannot be overlooked. And it is a long and arduous task to

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<sup>36</sup> Department of Energy, "U.S., China Sign Agreement to Establish Center of Excellence on Nuclear Security," January 19, 2011: <https://www.energy.gov/articles/us-china-sign-agreement-establish-center-excellence-nuclear-security>

<sup>37</sup> The COE is a collection of laboratories, test sites, and training facilities. The Center works with Pacific Northwest National Laboratory (PNNL), who also advise on the physical protection curriculum and instruct the COE instructors. See Alina Constantin, Andrew Newman, and Thomas Isaacs, "Nuclear Security Centers of Excellence in Asia: Opportunities for Collaboration," NTI, August 2017: [https://media.nti.org/documents/NTI\\_Centers\\_of\\_Excellence\\_in\\_Asia\\_Background\\_Paper\\_Aug2017.pdf](https://media.nti.org/documents/NTI_Centers_of_Excellence_in_Asia_Background_Paper_Aug2017.pdf): 3.

<sup>38</sup> See Cann, Davenport, Balza, "The Nuclear Security Summit: Assessment of National Commitments": 9–10.

effectively manage the security and safety risks in the development and utilization of nuclear energy.<sup>39</sup>

At the 2014 Summit in The Hague, President Xi stated that China “must follow a sensible, coordinated and balanced approach to nuclear security and put it on the track of sound and sustainable development.”<sup>40</sup> He further pledged that “China will stay firmly committed to strengthening its own nuclear security capability” and “to building the international nuclear security system.”<sup>41</sup>

At the 2016 Summit in Washington, D.C., China and the United States agreed to a joint statement on nuclear security. In the statement, both states committed to intensifying cooperation to prevent nuclear terrorism and to continue advancing Summit goals. Both the United States and China committed to continue cooperation to convert China’s remaining Miniature Neutron Source Reactor (MNSR) at Shenzhen University to low enriched uranium (LEU), and other such reactors in Ghana and Nigeria. In addition, both countries pledged to cooperate to fight nuclear material smuggling and to strengthen cooperation on securing radioactive sources. The statement also declared that both sides would conduct an annual dialogue on nuclear security, providing an important forum for the countries to discuss and strengthen nuclear security cooperation.<sup>42</sup> To date, China and the United States have held three annual nuclear security dialogues (2016, 2017, 2018).<sup>43</sup> It is unclear, however, whether one will be held in 2019.

Though China was active in all of the summits, it was not until the last one in 2016 that Chinese nuclear security commitments and activities grew sharply.<sup>44</sup> At the 2016 Summit, China signed six joint statements, committing to countering nuclear smuggling, implementing UN Security Council Resolution 1540, supporting an LEU fuel bank, supporting nuclear security training and support centers, and strengthening cyber security at nuclear facilities. These increases indicated the value and importance that China placed on high-level summits. The evolution of its level of commitment from the first to the last summit also indicated Beijing’s cautious approach to the issue. It seemed to be waiting to see whether the momentum and/or the norm behind the importance of global nuclear security efforts would grow before fully committing itself to tackling global nuclear terrorism concerns.

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<sup>39</sup> Hu Jintao, “Towards Greater Nuclear Security Through Cooperation: Statement at the Seoul Nuclear Security Summit,” Seoul, March 27, 2012: <http://www.china-embassy.org/eng/zgyw/t920822.htm>

<sup>40</sup> Xi Jinping’s statement at Nuclear Security Summit in The Hague, May 30, 2014: <http://cl.china-embassy.org/esp/zldt/t1160914.htm>

<sup>41</sup> *Ibid.*

<sup>42</sup> U.S.-China Joint Statement on Nuclear Security Cooperation, March 31, 2016: <http://www.nss2016.org/document-center-docs/2016/3/31/us-china-joint-statement-on-nuclear-security-cooperation>

<sup>43</sup> U.S. Department of State, “The United States and China Hold Third Nuclear Security Dialogue,” Bureau of International Security and Nonproliferation, April 17, 2018: <https://www.state.gov/remarks-and-releases-bureau-of-international-security-and-nonproliferation/the-united-states-and-china-hold-third-nuclear-security-dialogue/>

<sup>44</sup> Zhang, “China Makes Significant Nuclear Security Pledges at 2016 Summit.”

**FIGURE 3: Chinese Presidential Statements at the Nuclear Security Summits**

*President Hu's statement at the Nuclear Security Summit in Seoul (March 27, 2012)*<sup>45</sup>

- Between 2010 and 2012, China took active steps to enhance nuclear security in 5 areas:
  - i. Built nuclear security capacity: improved its legislative framework and strengthened nuclear security management
  - ii. Honoured its international nuclear security obligations (including CPPNM/A and ICSANT)
  - iii. Engaged in extensive international nuclear security cooperation (with the IAEA)
  - iv. Ensured nuclear security during major public events: developed and used new nuclear security equipment and tightened nuclear detection and inspection at venues
  - v. Provided assistance in nuclear security and safety to other countries: hosted trainings to nearly 100 trainees from over 10 Asia-Pacific countries
  
- Proposed 4 points to strengthen nuclear security:
  - i. Follow a scientific and sensible approach to nuclear security and boost confidence in the development of nuclear energy
  - ii. Strengthen nuclear security capacity building and live up to national responsibilities for ensuring nuclear security
  - iii. Deepen international exchanges and cooperation and improve nuclear security around the world
  - iv. Take a comprehensive approach and address both the symptoms and root causes of nuclear proliferation and nuclear terrorism

*President Xi's statement at the Nuclear Security Summit in the Hague (May 30, 2014)*<sup>46</sup>

- Between 2012 and 2014, China continued its efforts to enhance nuclear security in 4 areas:
  - i. Strengthened its own nuclear security capability: continued to enhance the government's regulatory capacity, increase investments in relevant technological development and human resources, and foster and develop a nuclear security culture
  - ii. Building the international nuclear security system: working with other countries to build an international nuclear security system
  - iii. Supported international cooperation on nuclear security (with the IAEA)
  - iv. Upholding regional and global peace and stability: working with other countries to remove the root causes of nuclear terrorism and nuclear proliferation
  
- Proposed 4 points to strengthen nuclear security:
  - i. Place equal emphasis on development and security, and develop nuclear energy on the premise of security
  - ii. Push forward international nuclear security efforts
  - iii. Bring more countries into the international nuclear security process, turning it into a global process
  - iv. Tackle the root causes of nuclear proliferation and nuclear terrorism

<sup>45</sup> Hu, "Towards Greater Nuclear Security Through Cooperation."

<sup>46</sup> Xi statement at Nuclear Security Summit in The Hague, May 30, 2014.



***President Xi's statement at the Nuclear Security Summit in Washington, D.C. (April 2, 2016)***<sup>47</sup>

- Between 2014 and 2016, China made the following new progress in nuclear security in 3 areas:
  - i. Explored effective ways to strengthen nuclear security: incorporated nuclear security in China's national security system, written it into the National Security Law
  - ii. Fulfilled its international obligations and political commitment: opened the COE in Beijing; converted the use of HEU-fueled Miniature Neutron Source Reactor to LEU fuels; and, through a Chinese-assisted program, converted a HEU-fueled research reactor in Ghana
  - iii. Promoted international exchanges and cooperation: China and the IAEA agreed to officially start implementing its first IPPAS.
  
- Announced 5 future plans to strengthen nuclear security:
  - i. Build a network for capacity building on nuclear security
  - ii. Promote cooperation model for less use of HEU
  - iii. Implement the action plan on strengthening the security of radioactive sources
  - iv. Launch the technological support initiative against nuclear terrorism
  - v. Promote its national security monitoring system for nuclear power

## **China's Approach to Nuclear Risk Reduction**

In trying to understand China's focus on nuclear security and nuclear risk reduction, it is important to keep in mind how China thinks and communicates about nuclear policy in general. Xu Weidi, a senior colonel in the People's Liberation Army (PLA) and a researcher at the Institute for Strategic Studies at the PLA's National Defense University, argues:

Chinese thinking on nuclear strategy is not presented in the form of a nuclear strategy review or white paper like those of Western nuclear-weapon states such as the United States, the United Kingdom, and France. Chinese nuclear thinking is more often revealed in individual, scattered speeches given by the country's leaders. The core content of China's nuclear strategy is not complicated, and it does not necessarily need to be explained in lengthy speeches or articles. Since the Cold War ended, the country has taken further steps to adhere to its nuclear strategy, which has been adjusted and developed in light of changing circumstances. However, as a strategic, ideological system, it has remained consistent without any fundamental structural changes.<sup>48</sup>

Though Xu is primarily focused on nuclear weapons policy when he talks about "nuclear strategy," the general approach is relevant to understanding Chinese commitments and strategy regarding nuclear security. Each of the speeches delivered by Chinese leaders at the Summits (outlined in Figure 3) provide insight into Chinese thinking on nuclear security, and reveal a

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<sup>47</sup> Xi Jinping's statement at the Fourth Nuclear Security Summit (Washington, D.C.), April 2, 2016: [http://www.chinadaily.com.cn/world/2016xivisitczech/2016-04/02/content\\_24246632.htm](http://www.chinadaily.com.cn/world/2016xivisitczech/2016-04/02/content_24246632.htm)

<sup>48</sup> Xu Weidi, "China's Security Environment and the Role of Nuclear Weapons," in Li Bin and Tong Zhao (eds.), *Understanding Chinese Nuclear Thinking* (Washington, DC: Carnegie Endowment for International Peace, 2016): 19-43: 42.

particularly consistent Chinese approach to the issue. The proposals outlined in these speeches can be categorized into six general groups:

1. Deepening international exchanges and cooperation
2. Tackling nuclear terrorism and nuclear proliferation
3. Creating an international network for capacity building on nuclear security
4. Promoting a cooperative model for less use of HEU
5. Strengthening the security of radioactive sources
6. Developing nuclear energy on the premise of security.

While there are likely other ways of organizing Chinese nuclear security priorities, these categories of interest align well with the actions that China has taken on nuclear security since the start of the Summit process (see Table 2).

**TABLE 2: Chinese Nuclear Security Proposals and Actions**

<b>China's Proposal</b>	<b>China's Actions</b>
Deepening international exchanges and cooperation	<ul style="list-style-type: none"> <li>. COE</li> <li>. INFCIRC/869</li> </ul>
Tackling nuclear terrorism and nuclear proliferation	<ul style="list-style-type: none"> <li>. COE</li> <li>. Ratified ICSANT</li> <li>. Issued a National Counter Terrorism Law</li> </ul>
Creating an international network for capacity building on nuclear security	<ul style="list-style-type: none"> <li>. COE</li> <li>. Contributing to IAEA Nuclear Security Fund</li> </ul>
Promoting a cooperative model for less use of HEU	<ul style="list-style-type: none"> <li>. Helped Nigeria convert a research reactor from HEU to LEU</li> <li>. Decommissioned two of its HEU research reactors</li> <li>. Completed conversion of Ghana's HEU research reactor and repatriated all HEU fuel to China</li> <li>. Led an international team to remove HEU from a Nigerian research reactor and repatriated all HEU to China</li> </ul>
Strengthening the security of radioactive sources	<ul style="list-style-type: none"> <li>. Upgraded security for radioactive sources</li> <li>. Conducted a national comprehensive examination on the safety and security of radioactive sources and radioactive materials in transport</li> <li>. Completed construction of radioactive waste repositories and the national storage center for spent radioactive sources</li> <li>. Conducted security inspections of over 15,000 users of radioactive sources</li> <li>. Developed new equipment to detect radioactive substances, used for border monitoring and securing major international events</li> <li>. Established a national radioactive source database</li> </ul>

	<ul style="list-style-type: none"> <li>. conducted a joint exercise with Russia on preventing illicit trafficking of nuclear and other radioactive materials</li> <li>. Signed cooperation documents with the United States and Russia on preventing illicit trafficking of nuclear and other radioactive materials</li> </ul>
Developing nuclear energy on the premise of security	. Drafted an Atomic Energy Law, promoting the export of nuclear power, nuclear fuel, and related equipment and technical services, placing strict limits on the exports of proliferation-sensitive items and dual-use materials. <sup>49</sup>

Beijing has traditionally been secretive about nuclear issues. This tendency stems from how it developed its nuclear weapons program: in a closed political environment where discussion and debate was suppressed.<sup>50</sup> Yet, China has been unusually transparent about nuclear security policies and practices, which has led to greater international confidence in its nuclear security practices. This level of transparency can be credited to both the Nuclear Security Summits and, to a certain extent, the NTI Nuclear Security Index—a biennial ranking of nuclear security conditions worldwide begun in 2012. Each Index assesses nuclear materials security conditions in 176 states across a broad framework capturing policies, actions, and other conditions that shape their nuclear security, classified as the “theft ranking.” Since 2016, the NTI Index started to look at a separate set of countries in a new “sabotage ranking.” This assessment reviews the nuclear security conditions of 44 states and Taiwan with respect to the protection of nuclear facilities against sabotage.

In the first Index, China’s overall (theft ranking) score was 52/100 which placed it 27<sup>th</sup> out of 32 countries with significant quantities of weapons-usable materials. In the most recent Index calculated in 2018, China’s theft ranking score was 71/100, placing it 14<sup>th</sup> out of 22 countries. Over the six-year reporting period of the Index, China was the second most improved country in the theft ranking, after Japan. Table 3 shows China’s gradual improvement in rankings per the NTI Nuclear Security Index.

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<sup>49</sup> Recently, China has been expanding its portfolio in the nuclear market. As Nguyen and Yim argue, despite being a latecomer in the export market and being occupied with strong domestic demand, the Chinese nuclear industry has been able to gain a foothold abroad by taking over nuclear contracts of which suppliers and/or customers have struggled financially (including the nuclear power plant projects in Romania, Argentina, and the United Kingdom). Given its financial advantages, strong political support from the government, and technological advantages (since China already possesses licenses for most of the advanced reactor technologies), Chinese nuclear corporations have emerged as strong contenders in the nuclear market. See Viet Phuoung Nguyen and Man-Sung Yim, “Nonproliferation and Security Implications of the Evolving Civil Nuclear Export Market,” *Sustainability*, Volume 11, Issue 7: 2019: <https://www.mdpi.com/2071-1050/11/7/1830>: 5.

<sup>50</sup> Fravel, M. Taylor and Evan S. Medeiros, “China’s Search for Assured Retaliation,” *International Security*, Vol. 35, No. 2 (Fall 2010): 48–87.

**TABLE 3: China’s NTI Nuclear Security Index Score/Rank Explained: 2012-2018<sup>51</sup>**

Year	THEFT		SABOTAGE		Explanation
	Overall Score	Ranked	Overall Score	Ranked	
2012	52/100	27/37	N/A		A lack of transparency proved challenging when evaluating China’s nuclear materials security condition. By providing the international community appropriate information about what security measures are in place, China could vastly improve confidence in its nuclear materials security conditions. <sup>52</sup>
2014	64/100	20/25	N/A		China continues to score poorly because its regulatory structures lack key requirements for securing materials. China’s personnel vetting requirements are not as stringent as other states. For example, China requires only background checks—not drug tests or mental fitness checks—for its personnel, and it does not require those checks to be repeated at specified intervals. In addition, its transport security regulations have not been updated to reflect the recently revised IAEA guidelines on transport security. Weaknesses are particularly apparent in the areas of transport security, material control and accounting, and measures to protect against the insider threat, such as personnel vetting and mandatory reporting of suspicious behavior. <sup>53</sup>
2016	60/100	19/24	59/100	34/42	China’s score improved by 1 point because of decreased levels of corruption, although it continues to score low because of its large quantities of materials and number of sites, and because its regulatory structure lacks

<sup>51</sup> See 2012, 2014, 2016, and 2018 “NTI Nuclear Security Index.”

<sup>52</sup> Deepti Choubey, Sam Nunn, Joan Rohlfing, Page Stoutland, “NTI Nuclear Security Index: Building a Framework for Assurance, Accountability, and Action,” January 11, 2012: [https://media.nti.org/pdfs/NTI\\_Index\\_FINAL\\_1.pdf](https://media.nti.org/pdfs/NTI_Index_FINAL_1.pdf): 29.

<sup>53</sup> Samantha Neakrase, Sam Nunn, Joan Rohlfing, Page Stoutland, “The 2014 Nuclear Threat Initiative Nuclear Security Index: Building a Framework for Assurance, Accountability, and Action, Second Edition,” January 10, 2014: <https://ntiindex.org/wp-content/uploads/2014/01/2014-NTI-Index-Report.pdf>: 45.

					key requirements for securing materials, including cybersecurity requirements. <sup>54</sup>
2018	71/100	14/22*  * China is ranked immediately after the United States in this ranking which was ranked joint 12 <sup>th</sup> .	73/100	26/45	China's score improved due to the following seven factors:  1. It made notable improvements to insider threat prevention and physical security during transport  2. It established a new Center of Excellence  3. It hosted an IAEA IPPAS mission in 2017  4. It passed new laws/regulations to mitigate the insider threat  5. It improved regulations dealing with the protection of nuclear materials when they are being moved and are most vulnerable to theft  6. It made new voluntary commitments in the form of bilateral or multilateral assistance  7. It made contributions to the IAEA's Nuclear Security Fund. <sup>55</sup>

An understanding of China's approach to nuclear security and nuclear risk reduction can also be gleaned from its statements and behavior at multilateral nuclear nonproliferation-related fora, including the NPT RevCon and the NSG. Ever since China's diplomatic isolation ended decades ago, it has become increasingly active and vocal at these fora. China typically espouses pronouncements relating to "upholding the authority and solemnity of the NPT – the cornerstone of multilateral arms control and nonproliferation" and, in regards to the NSG, seeking "a non-discriminatory solution acceptable to all based on full consultation," while imploring NSG members to "follow the rules and procedures."<sup>56</sup> Its public pronouncement of its "three no's

<sup>54</sup> Samantha Neakrase, Sam Nunn, Joan Rohlfing, Page Stoutland, "NTI Nuclear Security Index: Theft and Sabotage, Building a Framework for Assurance, Accountability, and Action, Third Edition," January 14, 2016: [https://media.nti.org/pdfs/NTI\\_2016\\_Index\\_FINAL.pdf](https://media.nti.org/pdfs/NTI_2016_Index_FINAL.pdf): 38.

<sup>55</sup> Page Stoutland and Erin D. Dumbacher, "NTI Nuclear Security Index: Theft and Sabotage, Building a Framework for Assurance, Accountability, and Action, Fourth Edition," September 5, 2018: [https://ntiindex.org/wp-content/uploads/2018/08/NTI\\_2018-Index\\_FINAL.pdf](https://ntiindex.org/wp-content/uploads/2018/08/NTI_2018-Index_FINAL.pdf): 20; 11 footnote 5; 12 footnotes 16 and 19.

<sup>56</sup> Mu Xuewan, "Envoy says China opposes nuclear proliferation in whatever forms," *Xinhua*, April 30, 2019: [http://www.xinhuanet.com/english/2019-04/30/c\\_138023016.htm](http://www.xinhuanet.com/english/2019-04/30/c_138023016.htm); "China rules out India's entry into NSG without 'consensus' on allowing non-NPT countries," *Economic Times*, June 21, 2019:

policy” in the early 1980s, in which it pledged no advocating, encouraging, or engaging in nuclear proliferation, continues to be referenced at these international fora. For example, at the third session of the Preparatory Committee for the 2020 NPT Review Conference held in April 2019, Fu Cong, head of the Department of Arms Control of the Chinese Foreign Ministry announced that China firmly opposes nuclear proliferation in whatever forms and participates in the political resolution of regional nuclear proliferation issues in a responsible manner.<sup>57</sup> It continues to advocate for the preservation of the NPT’s three pillars: nonproliferation, nuclear disarmament, and nuclear energy, and repeatedly calls out the United States and Russia “countries with the largest nuclear arsenals” to take the lead in making “drastic and substantive reductions in their nuclear weapons.” Yet it is also increasingly willing to spread peaceful technologies around the world.<sup>58</sup>

China’s vocal proclamations on the other facets of nuclear risk reduction are likely motivated by two factors: First, China’s long-standing nuclear weapons history/legacy; and second, its self-perception as the most responsible of the nuclear powers. China became a nuclear weapon state in 1964 and has stuck by its strategic doctrine of no first use since, providing security assurances to non-nuclear weapon states and affirming its commitment to the spread of “peaceful purposes” nuclear energy. Moreover, such proclamations are important for China’s image as a “responsible” great nuclear power, as opposed to one that is dangerous and expansionist. In light of these other commitments, China’s behavior in the nuclear security realm appears to be a logical continuation of its approach to nuclear risk reduction in general.

## **Conclusion: What Kind of Agenda Might China Put Forward?**

The above analysis provides insight into China’s approach to nuclear security policy making, and to nuclear risk reduction more generally. China met its words with actions throughout the entire Nuclear Security Summit process, ramping up its commitments toward the end of the summit process and working to fulfill what it set out to do. Should China assume greater global leadership on nuclear security efforts in the future, its approach to nuclear security policy making from 2010 to present would likely serve as a blueprint to its future priorities and actions. China would be likely to build off its past accomplishments by strengthening international nuclear security cooperation in three main ways:

*Continuing Sino-U.S. cooperation.* Sino-U.S. cooperation has been a staple of international nuclear security cooperation. Since 2006, China and the United States have conducted and engaged in nuclear protection and other related cooperative exercises. Recent – i.e., post Nuclear Security Summit process – joint nuclear security cooperation efforts include:

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<https://economictimes.indiatimes.com/news/defence/china-rules-out-indias-entry-into-nsg-without-consensus-on-allowing-non-npt-countries/articleshow/69893448.cms>

<sup>57</sup> Xuewuan, “Envoy says China opposes nuclear proliferation in whatever forms.”

<sup>58</sup> Wu Riqiang, “Trilateral arms control initiative: A Chinese perspective,” *Bulletin of the Atomic Scientists*, September 4, 2019: <https://thebulletin.org/2019/09/trilateral-arms-control-initiative-a-chinese-perspective/>

- The establishment of the Chinese COE (opened in 2016), borne out of the 2011 China and U.S. “Memorandum of Understanding on Establishing a Nuclear Security Center of Excellence”
- The jointly established radiation detection training center in Qinhuangdao to prevent illegal trafficking in nuclear materials (2011)
- The “Large Port Program” which installed nuclear radiation detection equipment to prevent nuclear and other radioactive material from being trafficked through the port (2011)
- Upgraded the security facilities of regional radioactive storage centers and collected dozens of extremely high-risk sources of radioactivity (2012-2016).<sup>59</sup>

Since nuclear security is a common interest for both countries, China and the United States have the potential to continue to play an important leadership role in this issue area. As such, both countries could expand their nuclear security and technical cooperation in order to strengthen the global nuclear security architecture. A good first step would be to continue the annual dialogue on nuclear security that both countries agreed to at the 2016 Nuclear Security Summit. This annual dialogue provides an important forum for both countries to discuss and continue to strengthen nuclear security cooperation. To date, China and the United States have held three annual nuclear security dialogues (2016, 2017, 2018), but a meeting in 2019 has not yet been scheduled.

*Build on the Center of Excellence (COE) capabilities.* Because the nuclear security COE is one of China’s most prominent contributions to national and regional security, it makes sense that in the future, China would rely on the center to: take the lead in developing regional cooperation; establish itself as a regional leader in nuclear security best practices training; expand exchanges and cooperation with other countries and international organizations

As a nuclear security exchange and training center, the center’s activities and capabilities include a variety of nuclear-related areas: nuclear security, nuclear safeguards and inspection, nuclear material control, and physical protection.<sup>60</sup> Consequently, the Chinese COE is well positioned to take the lead in developing regional cooperation, establish itself as a regional leader in nuclear security best practices training, and expand exchanges and cooperation with other countries around the world and international organizations, notably the IAEA.

In particular, China can use the COE as a platform to assist other countries with nascent nuclear security capabilities and to enhance nuclear security within Asia-Pacific and globally. As countries within East Asia are focusing on expanding their nuclear power programs, with China and several Southeast Asian states proposing nuclear power development plans, the center is well placed to facilitate and strengthen regional cooperation in nuclear security best practices.

*Eradicate the root causes of nuclear terrorism.* The Chinese presidential statements at each of the summits mentioned the importance of taking a comprehensive approach to addressing both the symptoms and root causes of nuclear terrorism as a way to strengthen nuclear security.

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<sup>59</sup> Liu, “Pressing Global Nuclear Security Problems and China’s Response”.

<sup>60</sup> *Ibid.*



Chong Liu, the deputy director of the Institute of Security and Arms Control Studies at the China Institutes of Contemporary International Relations—one of China’s largest, oldest, and most influential civilian research institutes for international studies—has argued that the principles for eliminating nuclear terrorism should be the same principles for eliminating all kinds of terrorism. To completely eradicate terrorism, he argues, requires working “simultaneously to ease regional and international tensions, eradicate poverty and strengthen anti-terrorism cooperation,” which entails comprehensive political, economic, cultural and social measures.<sup>61</sup>

Indeed, President Xi concluded his statement at the 2014 Summit in The Hague with the following proposal:

We need to foster a peaceful and stable international environment, encourage harmonious and friendly relations between countries, and conduct exchanges among different civilizations in an amicable and open-minded manner. This is the only way to tackle the root causes of nuclear terrorism and nuclear proliferation, and to achieve lasting security and development of nuclear power.<sup>62</sup>

Together with its progress on nuclear security, China has outlined specific policies on nuclear nonproliferation, including within the export control regime, and civilian nuclear cooperation. These actions suggest that Chinese leadership within the broader global nuclear risk reduction system would prioritize international cooperation and engagement, affirming China’s role as a responsible nuclear great power. As a consequence, the United States and others should be prepared to welcome Chinese leadership in nuclear security, especially at a time when there is not much agreement between China and the United States on nuclear (and indeed other) issues writ large. Even though China continues to modernize and expand its nuclear arsenal and, to a certain extent, provide cover for North Korea’s nuclear weapons program, its leadership role in nuclear security efforts should be encouraged in the hopes that it would continue to do as it says and as it does even beyond the nuclear security landscape. As President Xi surmised at the final Nuclear Security Summit, “What we plant in spring will blossom in summer, come to fruition in autumn and sustain us throughout the winter.”<sup>63</sup>

## About the Author

Dr. Sara Kutchesfahani is the Director of the N Square DC Hub, and Research Associate at CISSM. N Square is a path-breaking initiative built on the idea that new forms of cross-sector collaboration will accelerate the achievement of internationally agreed goals to reduce nuclear dangers. Together with her N Square responsibilities, she also works at CISSM in both a teaching and research capacity.

Most recently, she was a Senior Policy Analyst at the Center for Arms Control and Non-Proliferation, where she led the Fissile Materials Working Group (FMWG), focused on efforts to reduce the risk of nuclear proliferation and terrorism. She was previously the Executive Director for the Center for International Trade and Security and the Director for the Master of

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<sup>61</sup> *Ibid.*

<sup>62</sup> Xi’s statement at Nuclear Security Summit in The Hague, May 30, 2014.

<sup>63</sup> Xi Jinping, “Full text of President Xi Jinping’s Speech at the Fourth Nuclear Security Summit,” April 2, 2016, *China Daily*: [http://www.chinadaily.com.cn/world/2016xivisitzech/2016-04/02/content\\_24246632.htm](http://www.chinadaily.com.cn/world/2016xivisitzech/2016-04/02/content_24246632.htm)

International Policy (MIP) Program at the University of Georgia, where she worked on nuclear security-related projects and nuclear non-proliferation policy issues, and taught graduate courses on nuclear non-proliferation history and the global nuclear order.

She has held research positions at Los Alamos National Laboratory, the RAND Corporation, the European Union Institute for Security Studies in Paris, and the International Institute for Strategic Studies in London. She holds a PhD in Political Science from University College, London, and is the author of *Global Nuclear Order* (Routledge: 2019) and *Politics and the Bomb: The Role of Experts in the Creation of Cooperative Nuclear Non-Proliferation Agreements* (Routledge: 2014).