An Arms Control Association and Partnership for Global Security Report

The Nuclear Security Summit: Assessment of National Commitments

Updated and Revised March 20, 2012

Michelle Cann, Kelsey Davenport and Margaret Balza

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"Looking forward to the 2012 Seoul Nuclear Security Summit, we expect to see even more accomplishments of commitments made in Washington, and new pledges of action that make real progress towards securing nuclear materials, preventing nuclear terrorism and illicit trafficking, and making the world a safer place."

—Laura Holgate, *Senior Director for Weapons of Mass Destruction Terrorism and Threat Reduction, National Security Council, October 7, 2011*

Executive Summary

This report highlights the advances in global nuclear material security that have taken place around the world since the April 2010 Nuclear Security Summit (NSS). In particular, it tracks the national commitments implemented by 30 countries and the International Atomic Energy Agency (IAEA) ahead of the 2012 Seoul NSS.

- A principle achievement of the 2010 NSS was gaining agreement by all 47 participating nations that nuclear terrorism is among the top global security challenges and that strong nuclear material security measures are the most effective way to prevent it.

- More than 60 national commitments made by 2010 summit participants are detailed in the White House's highlights document and U.S. national statement that were released after the summit. Implementation of these commitments is tracked in this report.

- Approximately 80 percent of national commitments from the 2010 summit have been completed, based on an assessment of open source documents as of February 2012. Important progress has been made in many areas, including ratifying international conventions, securing and removing highly enriched uranium (HEU) and plutonium stocks, and establishing new training collaboration centers and opportunities.

- Examples of completed national commitments include
  - development of new nuclear security centers of excellence, conferences, and training activities around the world by Canada, China, France, India, Italy, Japan, Kazakhstan, Saudi Arabia, and the Republic of Korea;
  - removal of all HEU from Chile; and
  - new funding support for the IAEA Nuclear Security Fund, HEU reactor conversion and material removals, and anti-smuggling initiatives contributed by Belgium, Canada, Japan, New Zealand, Norway, Russia, the United Kingdom, and the United States.

- The summit process has proven effective at strengthening the existing nuclear material security regime and quickly achieving progress on an unprecedented global scale. It is a unique vehicle with heads-of-state participation that holds great potential for building a stronger nuclear material security regime by breaking down the political barriers and combating bureaucratic inertia.

- It is critical to recognize that the nuclear material security challenge will not be solved even after all the national commitments made at the 2010 summit are completed. National commitments represent neither an exhaustive nor encompassing list of actions necessary to close existing gaps in nuclear security and prevent nuclear terrorism. Leaders must acknowledge that nuclear material security is an ongoing, long-term issue and sustained attention is needed to ensure that its tools continually evolve to meet new, emerging threats.

- The 2012 NSS will maintain a central focus on nuclear material security, but will also include a greater focus on radiological source security and the interface of nuclear safety and security. The tragic 2011 accident at the Fukushima Daiichi nuclear power plant reminded the world that nuclear crises do not respect borders and that people and the environment need to be protected from the harmful effects of uncontrolled releases of radiation. Multilateral actions are vital to protect the global public.

- Summit organizers have indicated that the NSS process was not meant to be a permanent institution, and the final summit could be held in 2014 in the Netherlands. Leaders at the 2012 summit should acknowledge the value of this process in achieving global nuclear security progress and determine how best to adapt it to shape more global and sustainable nuclear material security governance structures into the future.

Introduction

In April 2010, representatives from 47 countries and three international organizations gathered in Washington, D.C., for the first Nuclear Security Summit (NSS). The summit focused on strengthening security for fissile materials worldwide and preventing nuclear terrorism through robust nuclear security measures. Participants endorsed the goal of securing all vulnerable nuclear materials within four years. The summit also brought greater global attention to the threat posed by fissile materials and spurred countries to take actions to strengthen the global nuclear security regime. Leaders concluded a consensus communiqué and work plan that focused on gaining compliance with the existing structures, mechanisms, and initiatives that comprise today's nuclear security framework. In addition, countries offered more than 60 specific national commitments to enhance nuclear security and prevent the illicit use of fissile materials. A second summit is being convened in Seoul during March 26-27, 2012.

Central objectives of the Seoul summit include reviewing progress made on implementing the 2010 NSS commitments and proposing new actions to further improve global nuclear security. The primary focus of the summit will continue to be on nuclear materials, but the agenda's scope in 2012 has been expanded to include a more in-depth focus on radiological source security and to address the nuclear safety and security interface. Many countries supported the inclusion of radiological source security at the 2010 summit. Radiological materials exist in nearly every country around the world, and high-intensity sources could be fashioned into a "dirty bomb" that spreads radiation. The March 2011 nuclear accident in Japan demonstrated that radiation does not respect national borders and dramatic consequences could result from an attack on a civilian nuclear reactor. Although other forums exist for addressing nuclear safety specifically, this incident highlights the need to discuss balancing safety and security measures.

Although the selective multilateralism practiced at the summits only includes a limited number of broadly representative countries, nuclear security is a global concern that affects all nations. Insufficient security for nuclear material and radiological sources poses a serious threat that will continue even if national commitments are fulfilled and the four-year goal is met. Global stockpiles of highly enriched uranium (HEU) and plutonium provide enough fissile material for tens of thousands of nuclear weapons, and the level of security over materials and facilities varies throughout the world. Even countries that do not possess fissile materials have a role to play in the security agenda, including by sharing information and working to prevent nuclear trafficking. Increasing states' ability to prevent theft or diversion of material and foster dialogue are primary aims of the NSS process.

The purpose of this report is to assess the progress made on specific national commitments before the 2012 NSS in Seoul. It aims to provide a broad audience with concrete examples of the progress made and demonstrate where needs and gaps remain. The national commitments included here were outlined in the U.S.

national statement and in a highlights document released by the White House at the end of the 2010 summit. U.S. national commitments were not included in the highlights document; the commitments from the U.S. national statement are included here for balance. Although more countries may have made additional commitments in their national statements, most of these statements were not made public. National commitments from 29 countries and the International Atomic Energy Agency (IAEA) are listed in the highlights document. Implementation of the communiqué and work plan objectives is not assessed in this report, as those documents are generally vague and nonbinding and did not set specific measurable goals that could be assessed on a country-by-country basis.

The significant progress toward fulfillment of the 2010 national commitments represents a major step in strengthening the global nuclear security regime. Approximately 80 percent of the national commitments from the 2010 summit have been completed. In short, countries are meeting their national commitments and positively impacting global nuclear security.

The information used to assess progress on the implementation of national commitments comes primarily from open source documents and is accurate as of February 2012. The level of commitment completion was assessed based on the actions taken by nations to undertake activities as described in the highlights document and U.S. national statement. Due to the sensitive nature of fissile material security, we acknowledge that countries may have taken actions toward the completion of national commitments that are not reflected in this report, as those actions may not have been made public or were announced after publication. This report also highlights some contributions made toward strengthening nuclear security outside of the national commitments, but it is not intended to be an exhaustive list of actions taken outside of the summit process since April 2010. Research results are presented first categorically and then by country.

PAUL J. RICHARDS/AFP/Getty Images

Leaders from 47 countries met in Washington, D.C., for the first Nuclear Security Summit in April 2010.

National Commitments by Category

More than 60 national commitments were made by 30 countries at the 2010 Washington NSS. At the start of 2012, approximately 80 percent of these have been implemented. As the host of the 2010 summit, the United States publicized the pledges made by 29 countries and the IAEA in a highlights document released by the White House after the summit and detailed its own additional commitments in the U.S. national statement. These national pledges were consistent with the consensus commitments contained in the summit's communiqué and work plan that were endorsed by the leaders of all 47 nations and three international organizations participating in the summit. However, tracking implementation of the consensus document pledges is difficult due to their nonbinding nature and the caveats that many contain, including phrases such as "as appropriate," when "technically and economically feasible," and "as soon as possible." In light of this, communiqué and work plan commitments are not tracked here.

This report provides an overview of the steps countries have taken to implement the voluntary, national commitments that are detailed in the White House highlights document and U.S. national statement. The actions taken by countries have been organized into nine categories.

- International Conventions
- Removing and Securing HEU and Plutonium
- Reactor Conversions and Shutdowns
- New IAEA Cooperation
- New Centers, Conferences, and Training Support
- New National Laws
- Global Initiative to Combat Nuclear Terrorism
- Preventing Nuclear Smuggling
- G-8 Global Partnership

International Conventions

The 2010 NSS communiqué and work plan recognize the importance of the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT), Convention on the Physical Protection of Nuclear Material (CPPNM), and the CPPNM 2005 amendment as legally binding, multilateral mechanisms for enhancing material security and preventing nuclear terrorism. Summit participants called for their

universal adoption.

The CPPNM has been ratified by 42 of the 47 NSS participants.[1] It is the only legally binding international instrument with physical protection requirements for nuclear materials, but is limited to material in international transport.[2] The CPPNM 2005 amendment extends protection requirements to the domestic use, storage, and transport of nuclear materials and sets new legal consequences for misuse and sabotage. The amendment is not yet in force because too few countries have ratified it. Since the 2010 NSS, 19 countries have ratified the amendment, and nearly half are summit participants.[3] Of these states, **Germany**, the **United Kingdom**, and **Argentina** were acting on their national pledges. The amendment was ratified by the United Kingdom in April 2010, by Germany in October 2010, and by Argentina in November 2011. **France** also pledged to ratify the amendment and was working to complete the process at the start of 2012. At the September 2011 IAEA General Conference, the French delegation reported that the country had set a goal of completing ratification "within the next few months."[4]

The 2005 UN treaty against nuclear terrorism, ICSANT, provides a definition of nuclear terrorism and details how offenders and illicit materials should be handled by states when seized.[5] Since the 2010 NSS, 12 countries have ratified ICSANT, and half are summit participants.[6] **Armenia**, **Georgia**, and the **United Kingdom** have acted on their national ratification pledges. Armenia ratified the convention in September 2010 and Georgia in April 2010. The United Kingdom ratified the convention ahead of the 2010 summit in September 2009. **Argentina** and **Australia** also committed to move toward ratification of ICSANT, but their work remains in progress.[7] For example, on February 28, 2012, Australia's parliament passed the "The Nuclear Terrorism Legislation Amendment Act 2011" which will allow Australia to ratify ICSANT.[8]

The national statement of the **United States** at the 2010 summit indicated that it was accelerating its efforts to ratify both the CPPNM 2005 amendment and ICSANT. In April 2011, the White House released a statement indicating that the Obama administration was submitting legislation to Congress necessary for ratifying both conventions.[9] Congress has not passed this legislation.

Removing and Securing HEU and Plutonium

Summit documents recognize that the use and management of nuclear materials and facilities are

YURI GRIPAS/AFP/Getty Images

U.S. Secretary of State Hillary Clinton and Russian Foreign Minister Sergey Lavrov fulfilled U.S. and Russian national commitments by signing a plutonium-disposition protocol during the Washington summit. The protocol requires each country to dispose of 34 tons of excess weapons-grade plutonium.

under the jurisdiction of individual states, but they encourage steps to keep them secure, including consolidation of storage sites and removal and disposition of fissile materials no longer in use. In this vein, a number of summit participants made national commitments to consolidate, secure, or remove nuclear materials in their territories.

Chile, Mexico, and Ukraine committed to a full clean-out of their HEU stocks. Kazakhstan pledged to cooperatively work on the BN-350 reactor shutdown and fuel security and eliminate HEU from a reactor set to undergo conversion from HEU to low-enriched uranium (LEU) fuel. Canada committed to funding HEU removal activities in Mexico and Vietnam and returning HEU spent fuel to the United States. Additionally, the United States and Russia pledged to sign a plutonium-disposition protocol, and the United States said it was in the final stages of obtaining legal and regulatory approval to allow it to bring plutonium into the United States from sites of concern.

Chile completed its national commitment to eliminate all 18 kilograms of HEU from the country ahead of the summit. In early 2010, the U.S. National Nuclear Security Administration (NNSA) worked with the Chilean Commission of Nuclear Energy to remove the HEU and more than 400 radiological sources from the La Reina Nuclear Center and the Lo Aguirre Nuclear Center.[10] The Chilean removal was the first HEU shipment to the United States to occur since a January 2009 authorization for the United States to accept limited amounts of non-U.S.-origin HEU spent fuel.[11]

Ukraine is on track to meet its commitment to give up half of its HEU by the end of 2010 and all of it by the 2012 summit.[12] On September 26, 2011, the United States and Ukraine signed a Memorandum of Understanding (MOU) formalizing this commitment.[13] Under the MOU, the United States will provide Ukraine with financial and technical assistance to eliminate the material and modernize its peaceful nuclear research activities. This assistance is expected to exceed $60 million in cost and include LEU reactor conversions and a new neutron source facility for medical isotope production that will be operational by 2014. In December 2010, the NNSA announced that 50 kilograms of HEU fresh fuel had been removed from three sites in Ukraine: Kiev Institute for Nuclear Research, Kharkiv Institute for Physics and Technology, and Sevastopol National University of Nuclear Industry and Energy.[14] Earlier that year, 56 kilograms of spent HEU fuel was returned to Russia from Ukraine for disposition.[15]

In November 2010, the U.S.-**Kazakhstan** Energy Partnership announced the completion of cooperative work on the BN-350 plutonium-production reactor shutdown and fuel security project.[16] Hundreds of scientists and specialists from the United States and Kazakhstan were part of the effort to secure three metric tons of weapons-grade plutonium and more than 10 metric tons of HEU.[17] Over the course of a year, 12 shipments of spent fuel were transported from Aktau to a new long-term, IAEA-safeguarded storage facility in eastern Kazakhstan.[18] Additionally, in May 2009 more than 70 kilograms of spent HEU fuel was returned to Russia, and 33 kilograms of fresh HEU fuel was down-blended into LEU in the fall of 2011.[19]

Canada committed to returning large inventories of spent HEU fuel to the United States. This fuel had been used to produce medical isotopes and is currently being stored at the Chalk River Laboratories in Ontario. At the 2010 summit, Canadian Prime Minister Stephen Harper announced that the project would take place between 2010 and 2018.[20] In addition to returning its own HEU, Canada also committed to provide funding for HEU removals in Mexico and Vietnam. A trilateral agreement among Canada, Mexico, and United States to work cooperatively on the project was announced at the 2010 summit and the removal has been completed in advance of the Seoul summit.[21] Canada is contributing approximately $5 million to help the U.S. NNSA's Global Threat Reduction Initiative (GTRI) implement the reactor conversion and HEU removal.[22] The Vietnam project is also in progress.

At the 2010 NSS, **U.S.** Secretary of State Hillary Rodham Clinton and **Russian** Foreign Minister Sergey Lavrov fulfilled national commitments to sign the Plutonium Disposition Protocol to the 2000 Plutonium Management and Disposition Agreement. Under this agreement, both countries commit to eliminating at least 34 metric tons of excess weapons-grade plutonium. The verification measures to ensure compliance are being negotiated, and in a letter to the IAEA, the two countries indicated that they hoped to have them completed before 2012.[23]

The **U.S.** national statement indicated that the country was in the final stages of gaining approval to bring up to 100 kilograms of plutonium into the United States from sites of concern for disposition. This approval was completed following required environmental impact appraisals and other assessments.

Additionally, other significant material removals have occurred outside of countries' publicized national summit commitments. For instance, **Poland**, an NSS participant, completed the removal of more than 450 kilograms of Russian-origin HEU spent fuel in October 2010 in collaboration with the NNSA.[24] **Belarus** committed to return all of its HEU to Russia in advance of the 2012 summit, but ultimately reneged on the pledge.[25] In October and November 2010, however, more than 84 kilograms of HEU was

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In April 2010, Russia shut down its ADE-2 reactor in Zheleznogorsk, fulfilling its national commitment to end plutonium production.

removed from a research facility in Sosny, Belarus.[26]

Overall, since President Barack Obama announced a four-year, international effort to secure vulnerable nuclear materials in his April 5, 2009, speech in Prague, the GTRI has eliminated all HEU from six countries: **Chile**, **Libya**, **Romania**, **Serbia**, **Taiwan**, and **Turkey**.[27] Since the 2010 NSS, the United States has removed 400 kilograms of HEU and plutonium and down-blended 700 kilograms of HEU from civil nuclear programs from countries around the world.[28]

Reactor Conversions and Shutdown

Summit participants encouraged the conversion of HEU-fueled reactors to LEU in the communiqué and work plan as part of efforts to minimize the use of HEU. They recognized that HEU and separated plutonium are particularly sensitive materials and agreed to take special precautions with them and shut down any reactors that are no longer required. In the spirit of this summit commitment, Kazakhstan, Mexico, Russia, the United States, and Vietnam pledged to shut down or convert reactors that use or produce weapons-usable nuclear materials.

Days after the 2010 summit, **Russia** fulfilled its national commitment to end plutonium production by shutting down the ADE-2 reactor in Zheleznogorsk.[29] During the Soviet era, this reactor was used to produce plutonium for nuclear weapons; since 1995, its main purpose has been supplying heat for the city.

In December 2010, **Vietnam** reaffirmed its national commitment to complete the conversion of its Dalat HEU research reactor in an MOU with the United States.[30] The NNSA previously worked with Vietnam in 2007 to partially convert the reactor and return 4.3 kilograms of fresh fuel to Russia. This new agreement provides the legal framework for full conversion and the return of the remaining fuel to Russia.[31]

Kazakhstan committed to convert an HEU research reactor and eliminate its remaining fuel. Cooperative efforts between the United States and Kazakhstan to convert a research reactor at the Institute of Nuclear Physics in Almaty are ongoing, but 33 kilograms of HEU fuel has already been removed and down-blended.[32] The United States, Kazakhstan, and the IAEA worked together to ship the material to the Ulba Metallurgical Plant in Ust-Kamenogorsk in August 2011 where it was down-blended into LEU and returned to the institute for future nuclear energy research.

Mexico committed to convert its research reactor, and a trilateral agreement with the United States and Canada on this project was announced at the 2010 NSS.[33] Under their agreement, the three countries will

work cooperatively with the IAEA on the project, and negotiations to define and set up the project have been initiated.[34] In August 2011, Mexico, the United States, and the IAEA signed an agreement detailing arrangements for replacing Mexico's HEU fuel for the TRIGA Mark III at the National Institute for Nuclear Research with LEU.[35] At the September 2011 IAEA General Conference, Mexico indicated that the fuel transfer could be completed by early 2012.[36] No timeline for the reactor conversion has been made public.[37]

In the **U.S.** national statement, the country committed to convert its six remaining HEU-fueled reactors to use LEU as soon as suitable fuel was developed. The statement noted the completed conversion of all 20 U.S. HEU reactors able to utilize current LEU fuels. No new U.S. reactors have been converted since the summit in April 2010.

New IAEA Cooperation

The essential role that the IAEA plays in advancing nuclear security was highlighted in the 2010 summit documents. The work plan detailed the valuable services and guidance materials that the agency offers. NSS participants were encouraged to take advantage of IAEA resources and to provide support for its nuclear security work. Belgium, Japan, New Zealand, Norway, Russia, and the United Kingdom made national commitments to provide additional funding to the IAEA's Nuclear Security Fund (NSF). Finland, France, the United Kingdom, and United States announced their intentions to invite International Physical Protection Advisory Service (IPPAS) security reviews.

At the 2010 NSS, Belgium committed to provide $300,000 and Norway committed to contribute $3.3 million over four years for use in developing countries. The United Kingdom committed to provide $6 million without specifying a time frame, and Japan, New Zealand, and Russia all pledged funds without specifying amounts or time frames.

The IAEA's annual nuclear security reports do not list the amounts that countries contribute to the NSF, but they do indicate who has made or pledged contributions that year. According to the 2010 and 2011 reports, every country that made a national commitment to provide NSF funding fulfilled it: **Belgium**, **Japan**, **New Zealand**, **Norway**, **Russia**, and the **United Kingdom**.[38] Additionally, NSF funding has also been provided during this period by Denmark, Estonia, Germany, Finland, France, Ireland, Italy, Korea, the Netherlands, Spain, Sweden, the United States, and the European Union.[39] In December 2010, Russia announced that it had signed an agreement to contribute $6.5 million between 2010 and 2015.[40] The United Kingdom signed a similarly sized funding agreement with the IAEA in March 2011 in which it committed to provide approximately $6.4 million.[41] The United States, EU, United Kingdom, and Canada are the NSF's largest contributors.[42]

Finland's IPPAS mission took place in June 2009, and a follow-up security review is planned for 2012.[43] The **United Kingdom's** IPPAS mission to the Sellafield Nuclear Reprocessing facility and Barrow port were completed in late October 2011.[44] **France's** IPPAS mission to the EDF power plant at Gravelines was completed in late November 2011.[45] According to U.S. officials, the **United States** has requested an IPPAS mission, but the IAEA's "Nuclear Security Report 2011" provides no update on its status.[46] The U.S. national statement indicated that the National Institute of Standards and Technology's Center for Neutron Research would be the facility reviewed.

New Centers, Conferences, and Training Support

Summit documents emphasized the importance of the human dimension of nuclear security, and countries responded with a series of national commitments to enhance nuclear security culture and build human capacity through hosting or establishing new training and educational centers, conferences, and other activities.

Canada and Japan pledged to fund and host nuclear security best practices workshops with the World Institute for Nuclear Security (WINS). Canada also announced that it would unveil $100 million in new bilateral security cooperation with Russia. Japan said it was launching an integrated regional support center and conducting research and development work on nuclear detection and forensic techniques. China and India announced their intentions to create new nuclear security centers of excellence. Kazakhstan said it would consider hosting an International Nuclear Security Training Center. Italy committed to establish a school of nuclear security in Trieste, and France said it would incorporate nuclear security training into the curriculum of the European Nuclear Safety Training and Tutoring Institute (ENSTTI) and the International Nuclear Energy Institute (I2EN). Saudi Arabia pledged to host a UN Security Council Resolution 1540 conference for the Gulf Cooperation Council (GCC). The Republic of Korea announced that it would host the 2012 NSS. The United States said it was providing support and funding for WINS, requesting additional nuclear security funding in fiscal year 2011, and contributing to the voluntary fund to help countries meeting their Resolution 1540 obligations. The United States also indicated that it had launched an international effort to develop a nuclear forensics library and other tools to assist governments investigating illicit nuclear materials. Additionally, the IAEA noted that it would soon release a fifth update of its "Nuclear Security Recommendations on

Physical Protection of Nuclear Material and Nuclear Facilities" guidance document.

Canada hosted a four-day WINS workshop titled "Guard Force Recruitment, Training, Deployment, and Exercises" in Ontario in June 2010 that helped inform the WINS International Best Practice Guide on Nuclear Guard Force management and operation.[47] Although Canada's new bilateral security cooperation with Russia has reportedly been implemented, the particulars about its efforts do not appear to have been publicized.[48]

Japan launched its new Integrated Comprehensive Support Center for Non-proliferation and Nuclear Security in December 2010. The Japan Atomic Energy Agency (JAEA) operates the center and hosted opening ceremonies in February 2011.[49] The center aims to help emerging nuclear power countries develop tailored institutional and technical infrastructure, provide human resources and capacity-building support, and enhance international cooperation and coordination.[50] The IAEA, the European Atomic Energy Community, Australia, China, Korea, and the United States are actively cooperating with JAEA on the center.[51]

In November 2010, the United States and Japan established a bilateral Nuclear Security Working Group to support their collaborative work related to the NSS process, Integrated Support Center, and other activities, such as nuclear forensics.[52] Japan also hosted a gathering titled "International Workshop on Nuclear Forensics Following on the Nuclear Security Summit" in October 2010 and a WINS workshop titled "Corporate Governance and Security Leadership" in June 2010.[53]

At the 2010 NSS, **China** announced its intention to cooperate on the creation of a nuclear security center of excellence. In January 2011, the United States and China signed an MOU to enable the NNSA to work with China's Atomic Energy Authority on a center of excellence.[54] The center 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.[55] The center will be located in Beijing, and construction is set to begin after a project review is completed.[56] The NNSA committed to provide some equipment to the center and help develop its training programs and best practice exchanges.[57] Additionally, the United States and China continue to engage on nuclear security matters in other ways, including

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In November 2010, Kazakhstan and the United States announced the completion of cooperative efforts to secure three tons of weapons-grade plutonium and 10 tons of HEU. The nuclear materials were transported from the BN-350 reactor to a secure storage site in eastern Kazakhstan in 12 shipments.

through the Joint Coordinating Committee of the U.S.-China Peaceful Uses of Nuclear Technology Agreement in March 2011 and the installation of a radiation detection system at China's Yangshan port in December 2011 as part of the NNSA's Megaports Initiative.[58]

India announced at the 2010 NSS that it would create a nuclear energy center that would include a nuclear security component. India's Global Centre for Nuclear Energy Partnership (GCNEP) is under construction at Kheri Jassaur, near Bahadurgarh, Haryana.[59] In September 2011, the Indian Atomic Energy Commission (AEC) announced that a regional training course on nuclear security, titled "Physical Protection of Nuclear Facilities against Sabotage: Assessing Vulnerabilities and Identifying Vital Areas," would take place in New Delhi in November to launch the GCNEP. The center is owned and operated by the Indian government, but open to international participation.[60] It is intended to improve international cooperation on advanced nuclear energy systems, nuclear security, radiological safety, and radiation technology applications to health, food, and industry. An MOU on cooperating on the GCNEP was signed during Obama's trip to India in November 2010.[61] Then, at the U.S.-India Strategic Dialogue in July 2011, a joint statement indicated that a U.S.-India Joint Working Group would hold its first meeting in late 2011 to begin implementing the GCNEP MOU.[62] India has also signed an MOU related to the center with Russia and is expected to complete one with the IAEA and possibly France and the United Kingdom.[63]

At the 2010 NSS, **Kazakhstan's** president said that his country would consider hosting an International Nuclear Security Training Center, but no new information on this has been publicized.[64]

Although not listed as national commitments in the highlights document, other countries are also pursuing the creation of nuclear security centers of excellence for training and information sharing. For example, the **Republic of Korea** announced in September 2010 that it would open an International Nuclear Security Training Center in 2013.[65] This center is intended to support the peaceful use of nuclear energy while mitigating its risks of misuse. Also in 2010, the **EU** launched its CBRN Centres of Excellence Initiative to help countries and regions maintain the institutional capacity needed to fight against chemical, biological, radiological, and nuclear threats.[66] It aims to establish Centres of Excellence in five regions of concern: south Caucasus/Ukraine/southeast Europe, North Africa, West Africa, the Middle East, and Southeast Asia.[67] A regional secretariat opened in Amman, Jordan, in December 2011, and 19 projects have been selected for implementation.[68]

Italy committed to establishing a school of nuclear security in Trieste that would help train nuclear personnel from developing countries. In April 2011, the "International School on Nuclear Security" was held at the International Centre for Theoretical Physics in Trieste. The IAEA and Italian Ministry of Foreign Affairs co-sponsored the school in collaboration with the Central European Initiative and Kuwait Foundation for the Advancement of Science.[69]

French President Nicolas Sarkozy announced in March 2010 that **France** would create I2EN to interact with the new nuclear security centers of excellence around the world and would expand training opportunities for nuclear professionals.[70] France's September 2011 statement at the IAEA General Conference indicated that I2EN was operational and the number of grants available to foreign students seeking nuclear training programs at the International Nuclear Academy would be increased.[71] France also committed to incorporating nuclear security training into ENSTTI's curriculum. In June and July 2011, ENSTTI held an "Introduction to Nuclear Safety" course in Munich that included a one-day track on nuclear security and nonproliferation.[72] It explored nuclear security principles and culture, the intersection of nuclear safety and security, nonproliferation and international safeguards, and physical protection, control, and accounting for nuclear materials.

Saudi Arabia satisfied its commitment to host a Resolution 1540 conference for the GCC in December 2010.[73] The regional workshop took place in Riyadh and focused on implementing Resolution 1540 to prevent terrorist acquisition of weapons of mass destruction (WMD). Participants included representatives from China, France, Kuwait, Mexico, Oman, Qatar, Russia, the United Arab Emirates (UAE), United Kingdom, and United States and UN offices.

The **Republic of Korea** is hosting the 2012 NSS in Seoul on March 26-27, 2012. More than 50 countries and international organizations will attend. The primary focus of the agenda will continue to be nuclear material security, but participants will also address radiological sources security in greater depth and examine the interface of nuclear safety and security. Countries are again anticipated to endorse a "Seoul Communiqué" and offer new, voluntary national ("house gifts") or multilateral ("gift baskets") commitments. The communiqué is likely to include a commitment by countries to minimize the civil use of HEU.[74]

Countries' summit representatives—sherpas and sous sherpas—have engaged in a series of preparatory meetings to develop the substance of the 2012 NSS. Meetings took place in **Argentina** in November 2010, **Austria** in March 2011, the **Republic of Korea** in June 2011, **Finland** in October 2011, and **India** in

NNSA

In October 2010, Polish, U.S., and Russian agencies completed a 12-month cooperative effort that shipped more than 450 kilograms of spent HEU fuel from Poland to Russia for disposition.

January 2012.[75] Regional meetings hosted by other summit participants in support of the NSS process have also been held, including in **Poland** and **Chile**.[76] Additionally, several expert dialogues have been organized since the 2010 summit by Korean and other international policy organizations in support of evolving the nuclear material security regime through the summit process.

U.S. support for the activities of WINS began with a funding pledge of $3 million in 2009 and has continued with additional funding from the departments of State and Energy.[77] As detailed in the WINS 2010 annual report, the United States has engaged with the organization in a number of forums.[78] Additionally, as indicated in its national statement, the United States requested additional nuclear security funding in fiscal year 2011. Nearly $2 billion was sought by the administration to support international WMD security programs in the NNSA and the Department of Defense, including an additional $320 million specifically to support the four-year effort to secure vulnerable nuclear materials around the world that was endorsed at the 2010 NSS.[79] However, Congress did not support the administration's full request.[80] The fiscal year 2012 request for NNSA and Defense Department programs was lower than in fiscal year 2011, but largely supported by the Congress in the final omnibus funding act.[81] In fiscal year 2011, the United States provided $3 million for a Resolution 1540 implementation fund.[82] In fiscal year 2012, an additional $1.5 million to support this fund was appropriated.[83]

Finally, the **IAEA** released its fifth revision of "Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities" in early 2011.[84] This document provides guidance and recommendations for creating and implementing physical protection measures for nuclear materials and facilities and was last revised in 1999.[85] Additionally, the agency has launched a nuclear security information portal to serve as a centralized hub of nuclear security topics and activities and is helping to coordinate the activities of the nuclear security centers that are being created around the world. One such coordination meeting was held in June 2011.[86]

New National Laws

Given that it is the responsibility of states to ensure that the nuclear material on their territory is protected, summit documents encouraged participants to maintain and enforce effective national laws and regulations to keep materials

secure and criminalize any misuse or misconduct. In advance of the 2010 summit, Armenia, Egypt, and Malaysia passed new export controls laws and regulations to govern their nuclear activities.

Armenia passed new export control laws in November 2009. The legislation updated the country's munitions controls and regulations and was accomplished in cooperation with the IAEA and U.S. State Department's Export and Border Control program.[87] The laws incorporate international best practices on strategic export controls to meet Resolution 1540 obligations. Additionally, in July 2010, Armenia adopted a new law and implemented a decree for dual-use goods.[88]

Egypt enacted a law in March 2010 titled "Regulating Nuclear and Radiological Activities" that confirms the country's adherence to all international, regional, and bilateral treaties and agreements it has ratified.[89] The law was passed as part of preparation to achieve the country's goal of building four nuclear reactors by 2025.[90]

In April 2010, **Malaysia** passed the "Strategic Trade Act 2010," which introduces new export controls and statutory penalties for companies that fail to comply with its export controls.[91] It was Malaysia's first export control legislation specifically designed pursuant to Resolution 1540 obligations.[92] It includes controls on both the physical and electronic movement of strategic goods and technologies.

Global Initiative to Combat Nuclear Terrorism

The value of the Global Initiative to Combat Nuclear Terrorism (GICNT) in promoting nuclear security was recognized in summit documents, and participants were encouraged to work together and expand cooperation under this and other multilateral initiatives that support improved nuclear security. Since its creation in 2006, the GICNT has grown to include 82 countries and four official observers who voluntarily commit to implementing a set of nuclear security goals articulated in the GICNT Statement of Principles.[93]

Argentina, the **Philippines**, **Thailand**, and **Vietnam** all made national commitments to join the GICNT. These countries, plus Mexico and Singapore, were welcomed as new members at the GICNT's June 2010 plenary meeting.[94] Kazakhstan and the Republic of Korea committed to hosting activities for the group, and the United States pledged its continued support.

Kazakhstan fulfilled its commitment by co-hosting an exercise with Australia and the United States on countering the financing of nuclear terrorism. Kazakhstan also worked with Spain to hold the inaugural meeting of the GICNT's Implementation and Assessment Group (IAG) in September 2010.[95] Kazakhstan hosted a number of earlier GICNT activities, including its third plenary meeting in June 2007 and an "Atom Anti-Terror 2008" exercise in June 2008.

In June 2011, the **Republic of Korea** hosted the GICNT 2011 plenary meeting and the IAG meeting.[96] Korea previously hosted the GICNT events "Workshop on Detecting and Responding to Illicit Transport and Trafficking of Nuclear and Radioactive Materials" and the third Exercising Planning Group meeting in April 2009.

In its national statement, the **United States** reiterated its April 2009 pledge to continue to fund and support the GICNT and to turn it into a "durable international institution."[97] In fiscal year 2012, $6 million was requested for the State Department's WMD terrorism program, which helps support the GICNT.[98] Ideas under consideration by GICNT members for evolving it into a durable institution have been termed "enhancing implementation" and include "clearly identifying a policy making body, having a decision making mechanism that is open to all partners, better coordinating exercise planning, and…facilitating capacity building."[99] At the 2010 GICNT plenary meeting, five accomplishments aimed at enhancing implementation were highlighted, including the creation of two priority functions for the group: nuclear detection and nuclear forensics.[100] At the June 2011 plenary, a third priority function area was adopted: response and mitigation. Morocco will lead efforts to develop materials, workshops, and other collaborations in support of response and mitigation. The Netherlands and Australia are leading the working groups addressing nuclear forensics and detection. Documents on all three areas are expected to be delivered at the 2013 plenary meeting hosted by Mexico.[101]

Preventing Nuclear Smuggling

Summit documents emphasized the need for states to work together to prevent and respond to incidents of nuclear smuggling. One mechanism that supports this objective is the U.S. Megaports Initiative. It is part of the U.S. Second Line of Defense (SLD) program within the NNSA that provides equipment, training, and technical support to partner countries to help prevent nuclear and radioactive material smuggling at maritime ports. Another mechanism is the U.S. Nuclear Smuggling Outreach Initiative (NSOI). The NSOI engages with countries to create joint action plans to improve anti-smuggling capabilities and facilitate donor partnerships that fortify human and capital resources to prevent nuclear smuggling.

Italy and the UAE listed their recently signed Megaports Agreements with the United States as national commitments. New Zealand committed to contribute to the NSOI, and Norway pledged $500,000 in additional resources to support

upgrades to radiation portal monitors in Kazakhstan. Additionally, the U.S. national statement indicated that it had accelerated its time frame to develop and deploy new neutron-detection technologies from five years to 18 months.

The **UAE** signed an agreement with the United States in December 2009 to begin cooperative efforts to install radiation detection equipment and infrastructure at the ports of Abu Dhabi and Sharjah.[102] Under the framework, UAE officials will be trained to use and maintain the equipment. This agreement was signed in Abu Dhabi and builds on a Megaports Agreement signed with Dubai in 2005.

Italy signed its agreement in March 2010 under which the NNSA will work with the Customs Agency of the Italian Republic to defend against nuclear trafficking at several Italian ports, including Genoa and Gioia Tauro.[103] The agreement will enable the NNSA to provide equipment and training for the ports and includes cost-sharing arrangements.

Under the NSOI, **New Zealand** funded the provision of radiological monitoring equipment for the Boryspol International Airport in Kiev, Ukraine, in 2010.[104] This was the third NSOI-identified project to which New Zealand has contributed since 2007. Its 2007 NSOI funding enabled the supply, installation, and training of officials on radiation detection monitors and secondary inspection equipment at a Ukrainian-Russian border crossing, and its 2009 NSOI funding made similar radiation detection equipment and training possible in Kazakhstan.

In December 2010, a $500,000 contribution by **Norway** to the NNSA SLD program was announced. The funding was provided to install radiation detection equipment at Kazakhstan's Almaty Airport.[105] Norway also contributed more than $837,000 to the NNSA in 2009 to support anti-smuggling efforts in Kazakhstan.

The **United States** noted in its statement at the September 2011 IAEA General Conference that since the 2010 NSS, it had deployed 19 radiation detection systems worldwide.[106] Additionally, a U.S. Government Accountability Office report from September 2011 indicated that neutron detection technologies that do not rely on helium-3 were "sufficiently mature enough" to be considered in future portal-monitor deployment decisions.[107]

G-8 Global Partnership

The role and contributions of the Group of Eight (G-8) Global Partnership Against the Spread of Weapons and Materials of Mass Destruction were recognized in summit documents. The work plan welcomed additional programming to enhance nuclear material security by partners in this multilateral initiative. The Global Partnership was created in 2002 by the G-8 to provide $20 billion over 10 years for WMD safety, security, and nonproliferation projects in Russia and other former Soviet states. It currently has 16 partners beyond G-8 countries. Its geographic mandate was broadened in 2008, but operationally, work continues to be concentrated in Russia and other former Soviet states. At the time of the 2010 summit, the Global Partnership was set to expire in 2012. Therefore, Canada pledged to champion its extension, and the United States expressed support for a 10-year extension and an expansion of its mission and committed another $10 billion in funding for new projects.[108]

At the May 2011 G-8 summit in Deauville, France, leaders agreed to extend the Global Partnership beyond 2012.[109] No expiration date was set or new funding detailed. However, leaders expressed their objective of expanding the number of partners contributing to it and enlarging its scope to include nuclear and radiological security, biosecurity, scientist engagement, and facilitation of Resolution 1540 implementation.[110] Future funding will be decided "on a national, joint, or multilateral basis."[111] A few earlier efforts that contributed to the Global Partnership's extension include its track record of successes, the creation of an experts group to examine the future of the initiative at the June 2010 G-8 summit, and diplomatic and public outreach events, such as the March 2011 Canadian embassy event titled "Global Efforts in WMD Threat Reduction: Perspectives on the Nuclear Security Summit and G-8 Global Partnership."[112]

National Commitments by Country

Forty-seven countries and three international organizations attended the 2010 Nuclear Security Summit (NSS) in Washington, D.C. Although nuclear security affects every country, participation in the summit process was limited for practical purposes. As the 2010 summit's host, the United States focused on inviting countries that possessed civil and military fissile materials, are located along suspected nuclear trafficking routes, and were identified as regional leaders. The host of the 2012 NSS, the Republic of Korea, has opted to invite the 2010 attendees and several new participants, including Azerbaijan, Denmark, Gabon, Hungary, Lithuania, Romania, and INTERPOL.

The purpose of this section is to provide a brief nuclear security profile of each country that participated in the 2010 summit, including its membership in relevant international conventions, fissile material holdings, and relationship to the NSS process. These profiles also detail the implementation status of the national commitments made by 30 countries that are outlined in the "Highlights of the National Commitments Made at the Nuclear Security Summit" document and the U.S. national statement. The highlights document was compiled by the White House at the end of the 2010 summit. Although additional commitments may have been made in each country's national statement, this report confines itself to evaluating the commitments from the highlights document because not all the national statements were made public. National commitments made by the United States were not included in the White House's highlights document; U.S. commitments are drawn from its national statement.

Similar to the communiqué and work plan, the national commitments made at the NSS were nonbinding. By February 2012, however, approximately 80 percent of the national commitments were complete, with an additional 16 percent in progress. These numbers indicate that despite their nonbinding nature, countries are fulfilling the commitments they made in Washington.

Completion of the national commitments, however, is only a step toward securing all nuclear materials within four years, as the 2010 summit endorsed. Although these commitments demonstrate significant progress in the field of nuclear security, they also indicate areas where work remains to be done. The 2012 summit should celebrate the progress made on these commitments while encouraging participating countries to make even more ambitious strides to strengthen the global nuclear security agenda.

Notes and Sources:

Information on national commitments made in 2010 are from

- "Highlights of the National Commitments Made at the Nuclear Security Summit," April 13, 2010, http://www.whitehouse.gov/the-press-office/highlights-national-commitments-made-nss; and

- The White House, "Nuclear Security Summit National Statement of the United States," April 13, 2010, http://www.whitehouse.gov/the-press-office/nuclear-security-summit-national-statement-united-states.

The text of these documents can be found in the appendices of this report.

Information on fissile material holdings comes from either of the following sources, unless otherwise noted:

- International Panel on Fissile Materials (IPFM), "Global Fissile Materials Report 2011: Nuclear Weapon and Fissile Material Stockpiles and Production," January 10, 2012, http://www.ipfmlibrary.org/gfmr11.pdf; or

- Nuclear Threat Initiative, "Highly Enriched Uranium: Who Has What?" August 2011, http://www.nti.org/db/heu/Heu_Who_Has_What.pdf.

Not all countries declare their fissile material holdings. For some countries, a best estimate of HEU and plutonium stockpiles is provided. The symbol "±" denotes that there is some uncertainty to the estimates provided and that the actual fissile material holdings may fall within a larger range. Some countries, such as Brazil, Chile, Georgia, the Philippines, Republic of Korea, Spain, Sweden, Thailand, and Turkey, are listed as having less than 1 kilogram of HEU. Despite the remaining amounts, these countries are considered cleared of HEU by the IPFM. The remaining HEU in these countries is scrap material found primarily in old fuel plates and filters, making further disposition difficult and unnecessary.

Throughout this section, when fissile material is measured in tons, this refers to metric tons.

Unless otherwise noted, all information on nuclear weapons stockpiles is from

- Federation of American Scientists, "Status of World Nuclear Forces," February 19, 2011, http://www.fas.org/programs/ssp/nukes/nuclearweapons/nukestatus.html; and

- Robert S. Norris and Hans M. Kristensen, "U.S. Tactical Nuclear Weapons in Europe, 2011," *Bulletin of the Atomic Scientists*, Vol. 67, No. 1 (January/February 2011).

Membership in relevant international conventions was determined based on whether a country has deposited its instrument of ratification. The depository for the Convention on the Physical Protection of Nuclear Materials (CPPNM) and the CPPNM 2005 amendment is the International Atomic Energy Agency (IAEA). All information on ratifications of CPPNM and the CPPNM 2005 amendment can be found at

- IAEA, "Convention on the Physical Protection of Nuclear Material," http://www.iaea.org/Publications/Documents/Conventions/cppnm_status.pdf; and

- IAEA, "Amendment to the Convention on the Physical Protection of Nuclear Material," http://www.iaea.org/Publications/Documents/Conventions/cppnm_ amend_status.pdf.

The United Nations acts the depository for the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT). All information on the ratification status of ICSANT is found at

- "15. International Convention for the Suppression of Acts of Nuclear Terrorism," United Countries Treaty Collection, http://treaties.un.org/Pages/ViewDetailsIII.aspx?&src=UNTSONLINE&mtdsg_no=XVIII~15&chapter=18&Temp=mtdsg3&lang=en#Participants.

Several countries ratified relevant international treaties outside of their national commitments since the 2010 summit. Specific mention of ratifications, acceptances, or accessions that took place since the Washington summit are included in the notes section for each country.

Unless otherwise mentioned, all information on membership in the Global Initiative to Combat Nuclear Terrorism (GICNT) and on GICNT trainings and workshops is from

- "Global Initiative to Combat Nuclear Terrorism," Center for Nonproliferation Studies, July 18, 2011.

This report also incorporates national responses to a questionnaire sent out by the Fissile Materials Working Group in the fall of 2010. The survey was sent to the embassies and foreign ministries of the 47 countries that attended the Washington summit. It asked them to disclose any actions that they had taken toward meeting the commitments they made in Washington. Where relevant, their responses have been incorporated into this report.

Algeria

National Commitments Made at NSS

None

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

None

Notes

Algeria acceded to ICSANT in March 2011.

Argentina

National Commitments Made at NSS

1. Join the GICNT
   - Status: COMPLETED. Argentina joined in June 2010.

2. Move toward ICSANT ratification
   - Status: IN PROGRESS.[113]

3. Move toward the ratification of the CPPNM 2005 amendment
   - Status: COMPLETED. Argentina ratified the amendment in November 2011.

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: Signatory

Fissile Material Holdings

HEU: Less than 8 kilograms

Notes

Argentina shipped more than 44 kilograms of irradiated and unirradiated HEU fuel to the United States between 1996 and 2010. The remaining HEU is in old filters, fuel plates, and scraps that are in the final stages of being cleaned out.[114]

Armenia

National Commitments Made at NSS

1. Ratify ICSANT
   - Status: COMPLETED. Armenia ratified ICSANT in September 2010.

2. Passed new export control law
   - Status: COMPLETED. Armenia's new export law, passed in 2009, updated munitions controls and created new licensing procedures for the import and export of military materials. Additionally, in July 2010, new legislation for licensing and control of dual use goods was implemented.[115]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings

None

Australia

National Commitments Made at NSS

1. Move toward ICSANT ratification
   - Status: IN PROGRESS. On February 28, 2012, the Australian parliament passed the "Nuclear Terrorism Amendment Act of 2011" which will allow Australia to ratify ICSANT.[116]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: Signatory

Fissile Material Holdings

HEU: 2 kilograms

Notes

Australia's HEU clean-out is in its final phases.[117] More than 100 kilograms of U.S.-origin HEU have been removed from Australia since 1998.[118] Australia also possesses the largest known uranium fields, at approximately 23 percent of the world's total, and is the third-largest producer of uranium oxide.[119] Current Australian policy only allows uranium sales for nuclear energy purposes and prohibits any sale to countries that are not members of the nuclear Nonproliferation Treaty. In December 2011, the Labor Party voted to overturn the ban and sell uranium to India.[120] The country is also leading the GICNT priority function area on nuclear detection that was adopted at the June 2010 plenary meeting.[121]

Belgium

National Commitments Made at NSS

1. Contribute $300,000 to the IAEA Nuclear Security Fund (NSF)
   - Status: COMPLETED. The IAEA 2011 nuclear security report indicates that Belgium provided funding for the NSF.[122]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: 700-750 kilograms

Notes
The BR2 research reactor in Belgium provides 20 percent of the world's supply of molybdenum-99 (Mo-99) medical isotopes, which is widely used in treating cancer, heart disease, and brain disorders.[123] The United States sold HEU to Belgium in 2006 and 2010 to fuel the reactor with the agreement that the reactor undergo conversion when a high-density low-enriched uranium (LEU) fuel is available.[124] An estimated 10 to 20 B-61 gravity bombs, part of NATO's nuclear deterrent, are believed to be stored at the Kleine Brogel Air Force Base. In April 2005, the Belgium parliament passed a resolution to work toward the withdrawal of U.S. weapons from the country.

Brazil

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: Less than 1 kilogram

Canada

National Commitments Made at NSS

1. Return a large amount of spent HEU fuel from its medical isotope production reactor to the United States
   - Status: IN PROGRESS. The fuel is scheduled to be repatriated to the United States by 2018.[125]

2. Champion the extension of the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction
   - Status: COMPLETED. The Global Partnership was extended beyond 2012 during the May 2011 G-8 summit. The G-8 leaders aim to expand the Global Partnership's membership beyond the current 24 partners and broaden the scope of its work to include areas such as radiological security, biosecurity, and implementation of UN Security Council Resolution 1540.[126] No new funding commitments were made and no expiration date was set at the summit.

3. Fund HEU removals from Mexico and Vietnam
   - Status: IN PROGRESS. Canada pledged to provide approximately $5 million in funding to the U.S. Global Threat Reduction Initiative (GTRI) to support the HEU removal from Mexico.[127] Canada, Mexico, and the United States signed a trilateral agreement on the Mexican HEU removal at the 2010 summit, which was completed in early 2012.[128] No timeline for the HEU removal from Vietnam has been publicized.

4. Host and fund a World Institute of Nuclear Security (WINS) best practices workshop
   - Status: COMPLETED. Canada hosted a WINS workshop titled "Guard Force Recruitment, Training, Motivation, and Deployment" June 14-18, 2010, in Blue Mountain, Ontario.[129]

5. Unveil $100 million in new bilateral security cooperation with Russia
   - Status: COMPLETED.[130]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: Less than 500 kilograms[131]

Notes
Canada produces 40 percent of the world's medical isotope Mo-99.[132] The isotope is produced at the National Research Universal (NRU) reactor in Chalk River, Ontario, which accounts for a significant portion of Canada's HEU stocks. The HEU for the targets used at the NRU are imported from the United States and Russia, at an annual rate of about 15 kilograms per year.[133] The NRU's operating license is currently set to expire in 2016, and Canada committed to ending the use of HEU for this purpose at that time.[134] Canada also has three Slowpoke reactors, each fueled with 1 kilogram of HEU. Canada has yet to indicate if it will convert these reactors to LEU fuel.[135]

Chile

National Commitments Made at NSS

1. Removed all HEU in March 2010
    - Status: COMPLETED. Eighteen kilograms of HEU were shipped to the United States for disposition.[136]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: Less than 1 kilogram

Notes

Chile ratified ICSANT in September 2010.

China

National Commitments Made at NSS

1. Announce cooperation on a nuclear security center of excellence
    - Status: COMPLETED. China and the United States signed a memorandum of understanding (MOU) on the creation of the center in January 2011.[137] The China Institute of Atomic Energy indicated in November 2011 that construction would begin at the selected location after a project review. The center will serve as a place for exchanging best practices and technical information and help meet the training needs for developing countries.[138]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: 16 ± 4 tons
Plutonium: 1.8 ± 0.5 tons

Notes

China has never officially disclosed an accounting of their nuclear weapons and fissile material holdings. China is believed to have stopped production of weapons-grade HEU in 1987 and plutonium around 1990. The country is estimated to possess approximately 240 nuclear warheads. China did run two HEU research reactors, now converted to LEU, which would have consumed an estimated one ton of HEU.[139] Although China loaded its Experimental Fast Reactor, which went into full operation in 2011, with 240 kilograms of HEU fuel, trends indicate that China is moving toward mixed-oxide (MOX) fuel for future reactors and has converted several reactors to MOX fuel already.[140] In its most recent IAEA declaration, China did not list any separated plutonium for civilian use. In 2010, however, China began testing a reprocessing plant that would allow it to produce eight tons of separated plutonium per year for civilian use.[141] China also ratified ICSANT in November 2010.

Czech Republic

National Commitments Made at NSS

None

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: Less than 40 kilograms

Notes

The Czech Republic's remaining fissile materials holdings are irradiated HEU fuel. The removal of the remaining fuel for shipment to Russia is scheduled for 2013.[142] The Czech Republic became a party to ICSANT in December 2010.

Egypt

National Commitments Made at NSS

1. Passed new comprehensive nuclear law in March 2010 that includes nuclear security, criminalization of sabotage, and illicit trafficking provisions as well as envisages an independent regulatory authority
    - Status: COMPLETED. Egypt enacted the law in March 2010.[143]

International Instruments

CPPNM: No action
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings

None

Finland

National Commitments Made at NSS

1. Invited an International Physical Protection Advisory Service (IPPAS) security review from the IAEA

- Status: COMPLETED. The IAEA completed an IPPAS review in June 2009.[144]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
None

Notes
Finland indicated that it is planning for a follow-up IPPAS review in 2012.[145] Finland ratified the CPPNM 2005 amendment in June 2011.

France

National Commitments Made at NSS

1. Ratify the CPPNM 2005 amendment
   - Status: IN PROGRESS. France reiterated its commitment to ratifying the CPPNM 2005 amendment at the 2011 IAEA General Conference in September. In its statement, France indicated its own goal of completing ratification within several months.[146]

2. Invite an IPPAS security review from the IAEA
   - Status: COMPLETED. The IPPAS mission to the EDF power plant at Gravelines was completed in November 2011.[147]

3. Incorporate training in nuclear security at the European Nuclear Safety Training and Tutoring Institute (ENSTTI) and the International Nuclear Energy Institute
   - Status: COMPLETED. The ENSTTI summer 2011 training program held in Germany included a course titled "Nuclear Security and Non-Proliferation Objectives."[148] France's statement to the 2011 IAEA General Conference indicated that the International Nuclear Energy Institute was operational.[149]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: 30.6 ± 6 tons
Plutonium: 62 ± 1 tons

Notes
France possesses an arsenal of fewer than 300 strategic nuclear warheads. France's military stockpile of plutonium is estimated at six tons and its HEU at 26 tons ± 6 tons, although it ceased production of weapons-grade HEU in 1996. France also possesses an extensive stockpile of HEU and plutonium for civilian use. In its most recent IAEA disclosure, France declared 56 tons of plutonium and 4.6 tons of HEU for civilian use. France is also one of the few countries to continue reprocessing spent nuclear fuel. They accept spent nuclear fuel from other countries for that purpose. As a result, roughly 24 tons of foreign-owned plutonium, principally from Japan, is stored on French territory.[150] France has two power reactors that still use HEU fuel. France said it would begin converting these reactors as soon as an LEU alternative fuel becomes available.[151]

Georgia

National Commitments Made at NSS

1. Sign instrument of approval for ICSANT
   - Status: COMPLETED. Georgia acceded in April 2010.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: Less than 1 kilogram

Germany

National Commitments Made at NSS

1. Move toward ratifying the CPPNM 2005 amendment
   - Status: COMPLETED. Germany ratified the amendment in October 2010.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: 950 kilograms
Plutonium: 7.6 tons

Notes
Of Germany's 7.6 tons of separated plutonium, 5.6 tons are stored outside of the country. Germany operates an HEU-fueled research reactor in Munich, called FRM-II. German lawmakers originally required a conversion of FRM-II from 93 percent-enriched HEU to 50 percent-enriched HEU by the end of

2010.[152] However, in 2010 the president-minister of Bavaria extended the conversion deadline to 2018. As a result of this extension, Germany's HEU stockpiles are predicted to increase in the coming years and cross the 1,000-kilogram threshold, as FRM-II requires about 35 kilograms of HEU fuel per year.[153] Germany does not have the domestic facilities to produce HEU, and they currently rely on foreign imports. Approximately 730 kilograms of spent HEU fuel is stored in Germany because there is no pathway to the United States for disposition and German law no longer allows reprocessing of German fuel in France.[154] Germany has announced it will end its nuclear power program by 2022. The United States is believed to store 10 to 20 nuclear weapons in Germany at Büchel Air Base.

India

National Commitments Made at NSS

1. Announce the creation of a nuclear energy center with a nuclear security component
    - Status: COMPLETED. An MOU was signed with the United States in November 2010 and with Russia in June 2011 regarding the building and running of the new center. In September 2011, the Atomic Energy Commission announced that it would launch the new Global Center for Nuclear Energy Partnership in November 2011 with a regional training course in New Delhi. The course was titled "Physical Protection of Nuclear Facilities against Sabotage, Assessing Vulnerabilities and Identifying Vital Areas."[155]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: 2.0 ± 0.8 tons
Plutonium: 4.6 ± 0.65 tons

Notes

India continues to produce HEU and plutonium. India's nuclear arsenal, estimated between 60 and 80 warheads, is plutonium based. India produces plutonium at weapons and reactor grades. It is estimated that 0.52 tons ± 0.17 tons of its plutonium stockpile are of weapons grade. India is thought to be expanding its enrichment capabilities.[156] Currently, India's HEU is believed to be enriched to between 30 and 45 percent and is intended to fuel its nuclear-powered ballistic missile submarines.[157] India is believed to be working toward a fleet of five submarines with a nuclear core of 70 kilograms of HEU enriched to about 30 percent.[158] Sea trials are expected to begin in 2012.[159]

Indonesia

National Commitments Made at NSS

None

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: No action

Fissile Material Holdings

HEU: Less than 1 kilogram

Notes

Indonesia ratified the CPPNM 2005 amendment in May 2010.

Israel

National Commitments Made at NSS

None

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings

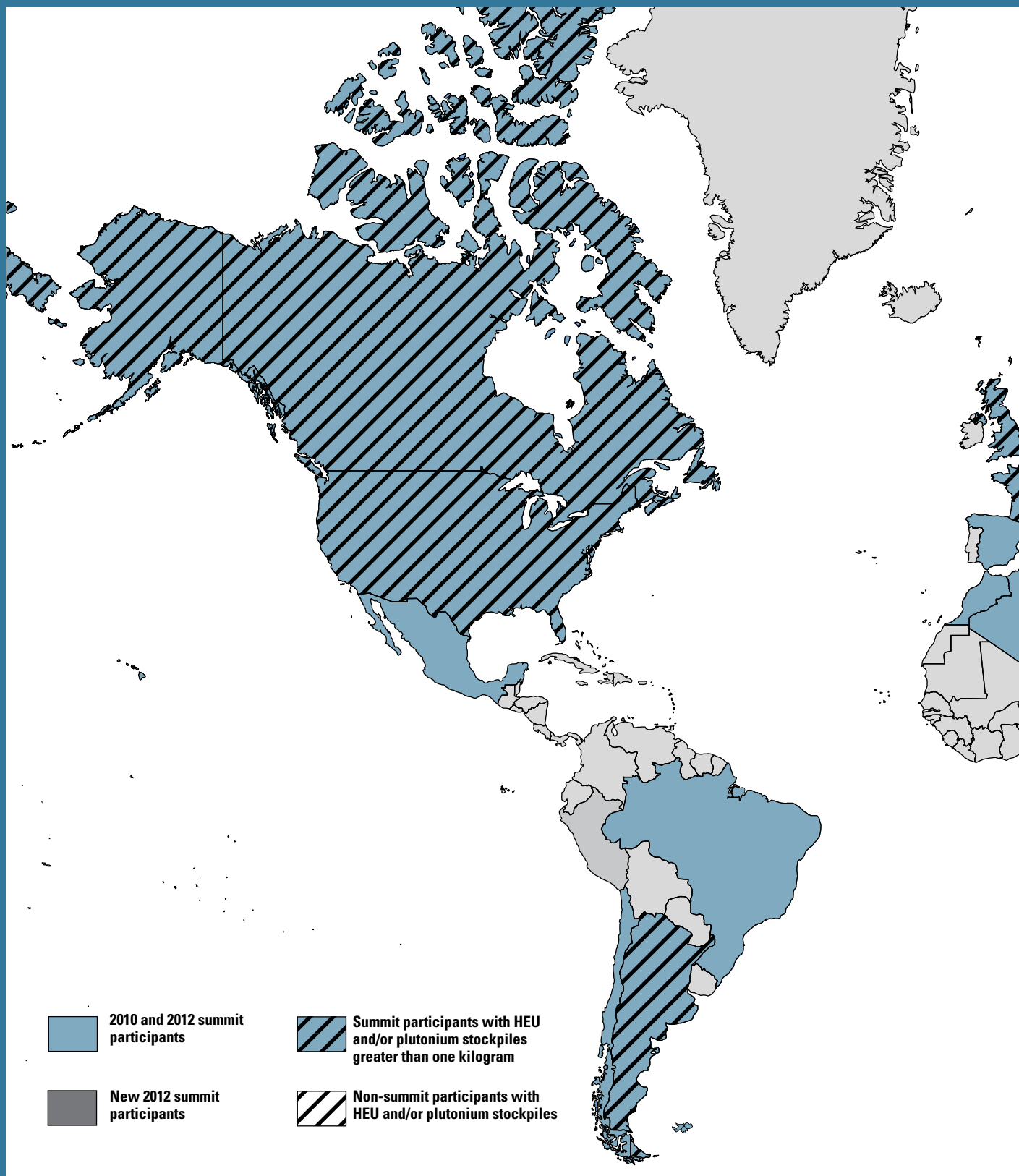
HEU: 0.3 tons
Plutonium: 0.82 ± 0.15 tons

Notes

Israel's government maintains extreme secrecy over every aspect of its nuclear program, making it difficult to estimate the size of its still unacknowledged nuclear arsenal and fissile material stockpiles or assess its nuclear security arrangements. Israel is known to operate a reactor and reprocessing plant at its Dimona facility that produces HEU and plutonium. Israel is believed to possess approximately 80 warheads. A recent audit of the Dimona facility by the Israel Defense Forces found that the security measures around the facility were insufficient. Allegedly, this resulted in further investment in the facility's monitoring systems.[160] The HEU stockpile carries even greater uncertainty. Of Israel's roughly 0.3 tons of HEU, 34 kilograms are estimated as marked for civilian use.

Nuclear Security Summit

Summit Participants and Fissile Materia



l Holdings

Italy

National Commitments Made at NSS

1. Signed a Megaports Agreement with the United States
   - Status: COMPLETED. Italy and the United States signed an agreement in March 2010 whereby the U.S. Department of Energy's National Nuclear Security Administration (NNSA) will cooperate with the Italian Customs Agency to prevent nuclear trafficking through Italian ports.[161]

2. Establish a school for nuclear security in collaboration with the IAEA
   - Status: COMPLETED. The IAEA opened the Nuclear Energy Management School at the Abdus Salam International Center for Theoretical Physics in Trieste in April 2011.[162]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: 100-200 kilograms

Notes
Italy's HEU stocks are primarily irradiated fuel from its little-used Tapiro fast-neutron reactor. An estimated 100 kilograms of the spent fuel is U.S.-origin material that is ineligible for return to the United States. In 2010, Italy reported to the IAEA that the reactor runs for only about 60 hours per year.[163] The HEU used to fuel Tapiro is a weapons-grade uranium metal alloy, a fuel type that makes reactor conversion to LEU difficult.[164] Italy also hosts an estimated 60 to 70 U.S. nuclear weapons at two locations, 50 at Aviano Air Base and another 10 to 20 at Ghedi Torre Air Base.

Japan

National Commitments Made at NSS

1. Launch an integrated regional support center
   - Status: COMPLETED. The Integrated Comprehensive Support Center for Nonproliferation and Nuclear Security was launched in December 2010 and began full-fledged operations in February 2011.[165]

2. Conduct research and development on detection and forensics
   - Status: COMPLETED. Japan hosted a meeting titled the "International Workshop on Nuclear Forensics Following on Nuclear Security Summit" in October 2010.[166] Japan also established a bilateral Nuclear Security Working Group with the United States in November 2010 to work on activities related to nuclear forensics and other NSS-related activities.[167]

3. Contribute new resources to the NSF
   - Status: COMPLETED. The 2011 IAEA report on nuclear security indicates that Japan contributed to the NSF.[168]

4. Host a WINS best practices workshop
   - Status: COMPLETED. Japan hosted a WINS workshop titled "Corporate Governance and Security Leadership" September 8-9, 2010, in Tokyo.[169]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: 1.2-1.4 tons
Plutonium: 44.9 tons

Notes
Of Japan's 44.9 tons of plutonium, 35 tons are stored outside the country—18 tons in France and 17 tons in the United Kingdom.[170] After the March 2011 earthquake that damaged Japan's Fukushima Daiichi reactor, Tokyo decided to undertake a comprehensive review of its nuclear energy program. A new policy outlining Japan's use of fissile materials is expected to be released in August 2012. As of February 2012, only 2 of the 54 reactors were functioning. This incident prompted the 2012 summit to increase its focus on the security-safety interface. Japan also has two research reactors and two critical assemblies that use HEU fuel. The GTRI is working with Kinki University, which runs one of the research reactors, and Kyoto University, which runs a critical assembly, to study the feasibility converting the research reactor and critical assembly to LEU use. The GTRI expects the conversion to take place in the next four years.[171] Japan's uranium-enrichment program is limited to producing LEU. The majority of its HEU originated in the United States and the United Kingdom. Between 1996 and 2010, Japan shipped 656 kilograms of HEU to the United States. Japan accounts for a significant share of the separated plutonium located outside of the nuclear-weapon states. In addition, Japan is currently the only non-nuclear-weapon state reprocessing fuel and fabricating fuel containing plutonium.[172]

Jordan

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: Signatory

Fissile Material Holdings
None

Notes
Jordan, in cooperation with the European Commission, established a nuclear security training center in Amman in December 2011.[173]

Kazakhstan

National Commitments Made at NSS

1. Convert an HEU research reactor and eliminate remaining HEU
    - Status: IN PROGRESS. In October 2011, officials announced that 33 kilograms of fresh HEU fuel were removed from the research reactor at the Institute of Nuclear Physics in Almaty, sent to Kazakhstan's Ulba Matallurgical Plant, and down- blended to LEU. Currently, Kazakhstan is working with the GTRI to covert the reactor to use LEU.[174] No timeline for conversion has been made public.

2. Cooperative work on BN-350 reactor shutdown and fuel security
    - Status: COMPLETED. This activity was completed in November 2010.[175]

3. Host a GICNT activity
    - Status: COMPLETED. Kazakhstan hosted a GICNT conference in September 2010, which included an exercise titled "Countering the Financing of Nuclear Terrorism" and the first meeting of the GICNT Implementation and Assessment Group.

4. Consider an international nuclear security training center
    - Status: NO PROGRESS EVIDENT. Kazakhstan's president, Nursultan Nazarbaev, has promoted Kazakhstan as a potential location for the proposed center in advance of the 2010 summit,[176] but no progress on establishing such a center is evident.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: 10.5-10.9 tons
Plutonium: At least 3 tons

Notes
Kazakhstan possesses one-half of the global HEU holdings located in non-nuclear-weapon states. With the collapse of the Soviet Union, Kazakhstan inherited the BN-350 reactor, which held more than 10 tons of HEU. Nearly all of Kazakhstan's HEU stockpile consists of fuel from that reactor, which was also used to breed plutonium for the Soviet Union's nuclear weapons program.[177] In November 2010, the United States and other international partners completed a long-term effort to shut down the reactor and provide long-term storage for its spent fuel in the Baikal-1 depository at Semipalatinsk, a facility in northeastern Kazakhstan. This included securing more than 10 tons of HEU and three tons of weapons-grade plutonium.[178] The remainder of Kazakhstan's HEU is stored in a research reactor. Fifteen to 30 percent of the world's uranium reserves are located in Kazakhstan, and it is one of the world's largest producers of uranium.[179] Kazakhstan ratified the CPPNM 2005 amendment in April 2011 and joined the Global Partnership in February 2012.

Malaysia

National Commitments Made at NSS

1. Passed new export control law
    - Status: COMPLETED. In April 2010, the Malaysian government passed a law designed to prevent the export or transshipment of materials linked to weapons of mass destruction (WMD).[180]

International Instruments
CPPNM: No action
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
None

Mexico

National Commitments Made at NSS

1. Convert an HEU research reactor and work through the IAEA to eliminate remaining HEU fuel
    - Status: IN PROGRESS. Mexico's HEU was stored in the country's sole research reactor,

the TRIGA Mark III, in Veracruz. Mexico signed agreements to cooperate with Canada, the United States, and the IAEA on HEU removal and conversion of the research reactor. In August 2011, Mexico, the United States, and the IAEA signed an agreement whereby the United States will provide Mexico with 113 kilograms of LEU in exchange for 10.8 kilograms of 70 percent-enriched HEU from the research reactor as well as fresh and irradiated fuel assemblies.[181] The return of Mexico's HEU was completed in early 2012.[182]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: Less than 1 kilogram[183]

Morocco

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
None

Notes
Morocco hosted the NSS regional outreach and GICNT conference for African countries in Rabat in November 2011.[184] The country will also lead the GICNT's third priority-function area that was adopted at the June 2011 plenary meeting: response and mitigation.[185] Morocco ratified ICSANT in March 2010.

Netherlands

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: 0.73-0.81 tons

Notes
The Netherlands produces 25 percent of the world's Mo-99 at its HFR research reactor in Petten.[186] The reactor has been converted to use LEU fuel, but still uses HEU targets. The Netherlands is planning a replacement for the HFR and is researching the use of LEU targets for the new reactor.[187] The country is leading the GICNT's priority function area on nuclear forensics that was adopted during the June 2010 plenary meeting.[188] The Netherlands accepted ICSANT in June 2010 and the CPPNM 2005 amendment in April 2011. Additionally, the Dutch requested an IPPAS review from the IAEA, which was scheduled for the second half of 2011.[189] The Netherlands hosts an estimated 10 to 20 U.S. nuclear weapons at Volkel Air Base. The 2014 Nuclear Security Summit will be hosted by the Netherlands. The chairmanship of the summit process will be officially transferred to the Dutch at the Seoul summit.

New Zealand

National Commitments Made at NSS

1. Contribute to the IAEA NSF
   - Status: COMPLETED. IAEA nuclear security reports indicate that New Zealand contributed to the NSF.[190]

2. Contribute to the U.S. Nuclear Smuggling Outreach Initiative (NSOI)
   - Status: COMPLETED. According to the NSOI, New Zealand provided equipment for radiological monitoring to Ukraine for Boryspol International Airport in Kiev in 2010.[191]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
None

Nigeria

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: No action

Fissile Material Holdings

HEU: About 1 kilogram

Notes
Nigeria imported a miniature neutron-source reactor from China that is fueled with one kilogram of HEU. China is in the process of converting the reactor to use LEU fuel.[192]

Norway

National Commitments Made at NSS

1. Contribute $3.3 million over the next four years to the IAEA NSF (flexible funds for use in developing countries)
    - Status: COMPLETED. The IAEA noted a contribution from Norway to the NSF in its annual report.[193]

2. Contribute $500,000 in additional support to Kazakhstan's efforts to upgrade portal monitors to prevent nuclear smuggling as part of the GICNT
    - Status: COMPLETED. Funding was provided to the NNSA in December 2010 for radiation detection equipment installation at the Almaty airport in Kazakhstan.[194]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: Signatory

Fissile Material Holdings
HEU: 1-9 kilograms

Notes
In the 1990s, Norway imported 9 kilograms of HEU, most of which has been blended down to LEU. The exact amount of remaining HEU is unclear, but Norway has said it will dispose of its remaining HEU fuel domestically.[195]

Pakistan

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: No action

Fissile Material Holdings
HEU: 2.75 ± 1 tons
Plutonium: 0.135 ± 0.045 tons

Notes
Pakistan is thought to possess an arsenal of 90 to 110 nuclear weapons. This estimate represents a significant increase in the number of warheads over the past several years.[196] The entirety of Pakistan's plutonium and the vast majority of its HEU is designated for military use.[197] The country does have a small civilian HEU stockpile, estimated at only 17 kilograms. The civilian stockpile is used for the PARR-2 research reactor. The remaining HEU is believed to be enriched to 90 percent.[198] Analysts have expressed concern over the status of nuclear security in Pakistan due to the threats it faces as a result of unrest within the country and the presence of extremist organizations.[199] Pakistan has taken a number of significant steps to improve its nuclear security over the past decade, including working with the United States to equip its ports with scanners to detect radiological material.[200]

Philippines

National Commitments Made at NSS

1. Join the GICNT
    - Status: COMPLETED. The Philippines joined the GICNT in June 2010.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: Less than 1 kilogram

Notes
The Philippines hosted the January 2012 WINS conference titled "Enhancing the Security of High-Activity Radioactive Sources."[201]

Poland

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: Less than 5 kilograms[202]

Notes
The exact size of Poland's HEU stockpile remains

unclear due to a number of HEU removals over the past several years. Most notably, in October 2010, the NNSA announced that it had removed more than 450 kilograms of HEU during the prior year.[203] These removals cleared out the Ewa research reactor.[204] The remaining HEU in the country is thought be contained in the Maria reactor, which uses HEU fuel to produce Mo-99. This reactor is scheduled to be converted to LEU use in 2012.[205] Poland ratified ICSANT in April 2010.

Republic of Korea

National Commitments Made at NSS

1. Host the 2012 Nuclear Security Summit.
   - Status: COMPLETED. The summit is scheduled to be held in Seoul on March 26-27, 2012.

2. Host a GICNT activity
   - Status: COMPLETED. Seoul hosted the GICNT plenary session in June 2011.[206]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings

HEU: Less than 1 kilogram

Notes

The Republic of Korea possesses an extensive LEU-fueled nuclear power program. Twenty-one reactors supply about 40 percent of the country's power, and an additional 11 reactors are in various stages of being planned and built.[207] As the country does not have enrichment or reprocessing capabilities, Korea relies on the United States to supply it with reactor fuel. Korea has a significant nuclear technology industry and is seeking to become a major exporter of nuclear reactors. The Korean government is planning to build a nuclear security center of excellence that will provide training on the prevention of nuclear terrorism. The center should be operational in 2013.[208]

Russia

National Commitments Made at NSS

1. Sign plutonium-disposition protocol
   - Status: COMPLETED. In July 2011, the Plutonium Management and Disposition Agreement entered into force. The agreement requires the United States and Russia to each dispose of 34 metric tons of weapons-grade plutonium, which is enough weapons-grade material for 17,000 nuclear weapons.[209] Disposition is scheduled to begin in 2018.

2. End plutonium production
   - Status: COMPLETED. Russia closed its last plutonium-production facility in April 2010.[210]

3. Contributing to the IAEA NSF
   - Status: COMPLETED. Russia signed an agreement with the IAEA in December 2010 to provide $6.5 million to the NSF.[211]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: 737 ± 120 tons
Plutonium: 176 ± 8 tons

Notes

Russia's 11,000 warheads and extensive stockpiles of fissile materials make it integral to the larger nuclear security agenda. Russia also runs an extensive civilian nuclear power program, with 31 nuclear power reactors at 10 power stations, and plans to build five new reactors. Russia has more research reactors than any other country. More than 50 research reactors, pulsed reactors, and critical assemblies use HEU, making Russia's civilian HEU stockpile (more than 20 tons) the largest in the world.[212] Russia has committed 104 tons of HEU to down-blending programs that should reduce their stockpile to 665 tons by 2013.[213] Of Russia's plutonium stockpiles, 48.4 tons was declared for civilian use in its most recent IAEA documentation.[214]

The United States and international organizations such as the Global Partnership fund and run an array of nuclear security-related programs in Russia. The functions of these projects include conducting security upgrades at nuclear facilities, consolidating Russian HEU, and converting Russian reactors to use LEU. These efforts have made varying degrees of progress in recent years. According to the U.S. Government Accountability Office (GAO), the Material Protection, Control and Accounting program has had the greatest success, conducting security upgrades at more than 100 sites. HEU minimization, consolidation, and reactor conversion projects, however, have been less successful.[215] In August 2011, the United States and Russia completed the installation of radiation detectors at every border crossing in Russia.[216]

Saudi Arabia

National Commitments Made at NSS

1. Host a Resolution 1540 conference for the Gulf Cooperation Council
    - Status: COMPLETED. Saudi Arabia hosted in the conference in Riyadh in December 2010.[217]

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
None

Notes
Saudi Arabia became a party to the CPPNM 2005 amendment in January 2011.

Singapore

National Commitments Made at NSS
None

International Instruments
CPPNM: No action
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
None

South Africa

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: State-party

Fissile Material Holdings
HEU: 610-760 kilograms

Notes
South Africa produces 10 percent of the world's supply of Mo-99 and has developed a means of producing the medical isotope using LEU targets rather than HEU.[218] In December 2010, the United States received the first large-scale shipment of Mo-99 produced using the new LEU technology.[219] In 2011, South Africa announced that, by the end of the year, they would begin producing the isotope in their NTP research reactor using only LEU fuel and LEU targets.[220] The country's stockpile of HEU is largely a result of domestic production for the nuclear weapons program that South Africa abandoned during the late 1980s. A portion, however, is U.S.-origin material, and in August 2011, 6.3 kilograms was returned to the United States for disposition.[221]

Spain

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: Less than 1 kilogram

Sweden

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: Less than 1 kilogram

Switzerland

National Commitments Made at NSS
None

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: 5-10 kilograms
Plutonium: Less than 0.05 tons[222]

Notes
Switzerland has an HEU reactor that is scheduled to be shut down. Switzerland's remaining plutonium is scheduled for disposition in France where it will be blended into MOX fuel and used for civilian power reactors.[223]

Thailand

National Commitments Made at NSS

1. Join the GICNT
   - Status: COMPLETED. Thailand joined the GICNT in June 2010.

International Instruments

CPPNM: No action
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings

HEU: Less than1 kilogram

Turkey

National Commitments Made at NSS

None

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings

HEU: Less than1 kilogram

Notes

Turkey's HEU was cleaned out in January 2010.[224] Turkey is believed to host approximately 60 to 70 U.S. nuclear weapons at Incirlik Air Base. Approximately 50 of the bombs are designed for U.S. aircraft use only, although there is no U.S. fixed fighter wing stationed at Incirlik. The remaining 10 to 20 bombs can be delivered by Turkish F-16s.

Ukraine

National Commitments Made at NSS

1. Remove all HEU by the next summit and half of it by the end of 2010
   - Status: IN PROGRESS. Two-thirds of Ukraine's HEU was removed from the country in 2010, fulfilling the latter half of Ukraine's commitment. The remaining HEU is scheduled for removal by the 2012 summit.[225]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

HEU: Approximately 50-150 kilograms

Notes

Ukraine is on track to complete its commitment to clean out its HEU stocks by the 2012 NSS. Prior to 2010, Ukraine's HEU was stored at three locations: a research reactor in Kiev, an experimental facility in Kharkiv, and a critical assembly in Sevastopol. With U.S. assistance, removals in May and December 2010 cleared 106 kilograms of HEU out of Ukraine. Ukraine signed an MOU with the United States in September 2011 committing to the removal of its remaining HEU holdings by April 2012.[226]

United Arab Emirates

National Commitments Made at NSS

1. Signed a Megaports Agreement with the United States
   - Status: COMPLETED. The United Arab Emirates (UAE) signed a Megaports Agreement with the United States in December 2009. Under this agreement, the NNSA worked with the UAE to install radiation detection units at several ports and train personnel on their use.[227]

International Instruments

CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings

None

United Kingdom

National Commitments Made at NSS

1. Contribute $6 million to the IAEA NSF
   - Status: COMPLETED. The United Kingdom signed an agreement with the IAEA in March 2011.[228]

2. Invite an IPPAS security review from the IAEA
   - Status: COMPLETED. The IAEA conducted an IPPAS review at the United Kingdom's Sellafield Reprocessing facility and Barrow port in October 2011.[229]

3. Ratified ICSANT
   - Status: COMPLETED. The United Kingdom ratified the treaty in September 2009.

4. Ratified CPPNM 2005 amendment
   - Status: COMPLETED. The United Kingdom ratified the amendment in April 2010.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: State-party
ICSANT: State-party

Fissile Material Holdings
HEU: 21.2 tons
Plutonium: 95.3 tons

Notes
The United Kingdom possesses a stockpile of fewer than 225 nuclear warheads. In July 2011, the government announced that it planned to reduce the number of operationally deployed warheads to 120 by early 2015. A year earlier, in 2010, the government released "Securing Great Britain in an Age of Uncertainty: The Strategic Defence and Security Review" which stated that the United Kingdom would work to reduce the total stockpile of warheads to 180 by the mid-2020s. The United Kingdom's warheads are deployed on submarine-launched ballistic missiles.[230] In addition, the United Kingdom possesses extensive civilian stockpiles of fissile materials. The United Kingdom reprocesses spent fuel from power reactors.[231] Of its HEU stockpile, 1.4 tons is designated for civilian use. Of the 95.3 tons of British-owned plutonium, 86.8 are for civilian use, making the United Kingdom's stockpile of civilian plutonium the largest in the world.[232] In addition to its own stocks, the British store 28 tons of foreign-owned plutonium, 17 tons of which are from Japan.[233]

United States

National Commitments Made at NSS
The commitments made by the United States were not listed in the highlights document. These commitments came from the national statement issued by the United States.

1. Request an IPPAS mission
   - Status: COMPLETED. In 2011 the United States requested an IPPAS review of an HEU facility.[234]

2. Accelerate efforts to ratify ICSANT and the CPPNM 2005 amendment
   - Status: IN PROGRESS. In April 2011, President Barack Obama submitted legislation to Congress that would bring U.S. law in line with the treaties. The legislation has yet to move out of the judiciary committee in the House of Representatives or the Senate.[235]

3. Convert its six remaining HEU-fueled reactors
   - Status: IN PROGRESS. The United States is currently developing new fuel that will allow it to convert the final six reactors. The United States originally indicated that they intended to complete conversion by 2014, but it is unlikely that the Energy Department will meet that goal.[236]

4. Sign plutonium-disposition protocol
   - Status: COMPLETED. In July 2011, the Plutonium Management and Disposition Agreement entered into force. The agreement requires the United States and Russia to each dispose of 34 metric tons of weapons-grade plutonium, which is enough weapons-grade material for 17,000 nuclear weapons. Disposition will begin in 2018.[237]

5. Seek approval to bring up to 100 kilograms of plutonium from sites of concern into the United States pending disposition
   - Status: COMPLETED.

6. Develop and deploy new neutron-detection technologies
   - Status: COMPLETED. A September 2011 GAO report stated that neutron detection technologies that do not rely on helium-3 were sufficiently developed as to allow for their deployment.[238]

7. Launch an international effort to develop a nuclear forensics library, exercises, common lexicons, and other foundational elements for cooperation in nuclear forensics
   - Status: IN PROGRESS. In November 2010, the United States and Japan established a bilateral Nuclear Security Working Group that will include nuclear forensic work.[239]

8. Provide financial support for WINS and the GICNT
   - Status: COMPLETED. In 2009 the United States pledged $3 million to support WINS.[240] In 2010 the WINS annual report noted a contribution of approximately $1.4 million from the Energy Department.[241] The GICNT is partially funded out of the Department of State's WMD terrorism program. The administration requested $6 million for that program in fiscal year 2012, which Congress appropriated in full.[242]

9. Requested the largest ever amount for nuclear security programs in its fiscal year 2011 budget
   - Status: COMPLETED. The fiscal year budget request contained nearly $2 billion for programs in the departments of Defense and

Energy aimed at international WMD security. Congress, however, provided funding below the administration request for 2011. The fiscal year 2012 budget request for the same programs, while lower than the 2011 request, received higher funding on average from Congress than the 2011 appropriations.[243]

10. Propose a voluntary fund to help countries meet their obligations under Resolution 1540
    - Status: COMPLETED. The United States proposed the fund, and the White House requested $3 million for it in fiscal year 2011 and $1.5 million in fiscal year 2012.[244]

11. Led efforts at the IAEA to establish for the first time a dedicated line item for nuclear security in 2009
    - Status: COMPLETED.

12. Support extension of the Global Partnership
    - Status: COMPLETED. During the May 2011 G-8 summit, the Global Partnership was extended indefinitely beyond its original expiration date in 2012. The United States also said it would give $10 billion to support the Global Partnership extension.

International Instruments
CPPNM: State-party
CPPNM 2005 amendment: No action
ICSANT: Signatory

Fissile Material Holdings
HEU: 610 tons
Plutonium: 91.9 tons

Notes
The total inventory of U.S. nuclear warheads is approximately 8,500. This number includes several thousand warheads awaiting dismantlement. The United States possesses the second-largest stockpiles of HEU and plutonium. Of the 614 tons of HEU in the United States, more than two-thirds are marked for military purposes, with 260 tons designated for weapons uses and 230 tons for naval reactors.[245] Of the remaining stockpile, 20 tons of HEU are for civilian use, and 104 tons are marked to be down-blended into LEU. The United States has already completed the blending down of more than 130 tons of HEU.[246] Of the plutonium stockpile, the United States designated 53 tons of plutonium as excess and reserved 38.3 tons for future weapons needs.[247] The United States also exports HEU. According to federal law, export of HEU fuel is only allowed for civilian purposes and if the reactors receiving the HEU are scheduled for conversion to LEU, LEU fuel is being developed, or conversion is impossible.[248] Research reactors in Europe and Canada that produce Mo-99 using HEU are exempt from the conversion requirement. In September 2011, the GAO released a report recommending that federal agencies play a greater role in tracking U.S.-origin materials overseas and ensuring that the material remains subject to IAEA safeguards overseas.[249] The United States has allocated 53.9 tons of plutonium for civilian use in its 2010 declaration to the IAEA.[250] The United States also plays a significant role in funding the removal and the securing of nuclear materials in foreign countries. The GTRI, a U.S. government program, has worked to shut down or convert 72 HEU research reactors and remove more than 2.8 tons of HEU around the world.[251] The GTRI also has worked with 22 countries to remove all HEU material and is working with 16 additional countries to remove the last of their HEU stockpiles. By the end of 2016, the GTRI plans to have converted or shut down 129 HEU reactors and removed 4.8 tons of HEU and plutonium.[252]

Vietnam

National Commitments Made at NSS

1. Convert a HEU research reactor
    - Status: IN PROGRESS. In December 2010, Vietnam and the United States signed an MOU to complete conversion of the Dalat research reactor. The timeline for conversion has not been made public.[253] The Dalat reactor, which is used for medical isotope production and research, was partially converted to LEU use in 2007.

2. Join the GICNT
    - Status: COMPLETED. Vietnam joined the GICNT in June 2010.

International Instruments
CPPNM: No action
CPPNM 2005 amendment: No action
ICSANT: No action

Fissile Material Holdings
HEU: 1-10 kilograms

2012 Seoul Nuclear Security Summit

March 26-27, 2012

Agenda

The 2012 summit will call attention to cooperative efforts to combat nuclear terrorism, protect nuclear materials and facilities, and prevent illicit nuclear trafficking. It will review the progress and emphasize practical implementation of 2010 summit commitments and objectives. The agenda will focus on many of the same topics that were covered during the 2010 summit, but it will also include a more in-depth treatment of radiological source security and explore the interface of nuclear safety and security.

- **Monday, March 26:** Welcome reception and working dinner
- **Tuesday, March 27:** Two plenary sessions and a working lunch followed by a concluding press conference

Participants

More than 50 world leaders are expected to attend the 2012 summit. Six new countries (Azerbaijan, Denmark, Gabon, Hungary, Lithuania, and Romania) and one new international organization (INTERPOL) will join the original 47 countries and three international organizations in Seoul this March. A conditional invitation was sent to the Democratic People's Republic of Korea, but it was not accepted because of its denuclearization requirement.[254] The Republic of Korea planned to invite Belarus to the summit if the country fulfilled its December 2010 declaration to eliminate all of its HEU holdings by 2012.[255] Belarus recanted on this commitment in August 2011, however, after the United States imposed sanctions on Belarusian companies for political repression.[256] Iran was not invited to either summit due to its unresolved nonproliferation issues that are being addressed in other forums.

Outcomes

A "Seoul Communiqué" is expected to combine the communiqué and work plan into a single document. States are expected to offer additional, voluntary national commitments ("house gifts") and possibly also present multinational or regional commitments ("gift baskets").

Side Summits

As in 2010, side summits for the nuclear industry and expert community are also being held. The "2012 Seoul Nuclear Security Symposium" for experts is being organized by the Korea Institute of Nuclear Nonproliferation and Control and the Institute of Foreign Affairs and National Security. The "2012 Seoul Nuclear Industry Summit" is being organized by Korea Hydro and Nuclear Power Co. Both events will include approximately 200 participants from around the world and take place on March 23.[257] The industry summit will include a visit to Korean nuclear power facilities the following day.

Conclusion

Two years after the 2010 Nuclear Security Summit (NSS), approximately 80 percent of the national commitments made there have been completed, and other notable steps to advance nuclear security have been taken by states in support of the summit's communiqué and work plan objectives. Completed national commitments include

- development of new nuclear security centers of excellence, conferences, and training activities around the world by Canada, China, France, India, Italy, Japan, Kazakhstan, the Republic of Korea, and Saudi Arabia;
- removal of all highly enriched uranium (HEU) from Chile; and
- new funding support for the International Atomic Energy Agency's (IAEA) Nuclear Security Fund (NSF), HEU reactor conversion and material removals, and anti-smuggling initiatives contributed by Belgium, Canada, Japan, New Zealand, Norway, Russia, the United Kingdom, and United States.

Countries that have made important progress implementing their national commitments include

- Ukraine, removing more than half of its HEU stocks and signing a memorandum of understanding (MOU) in September 2011 with the United States on completing its HEU clean-out by the 2012 summit;
- Mexico, eliminating its HEU and signing an agreement with the United States and IAEA in August 2011 associated with its reactor conversion commitment;
- Kazakhstan, completing the removal and down-blending of 33 kilograms of HEU fuel associated with its reactor conversion and HEU elimination commitment; and
- Vietnam, reaffirming its commitment to convert a HEU research reactor in an MOU with the United States in December 2010.

Since the 2010 NSS, the United States has removed 400 kilograms of HEU and plutonium and down-blended 700 kilograms of HEU from the civil nuclear programs of countries around the world. Other aggregate accomplishments, including actions taken outside of the national commitments, since the first summit include

- 19 countries ratifying the 2005 amendment to the Convention on the Physical Protection of Nuclear Material,[258]
- 12 countries ratifying the International Convention on the Suppression of Acts of Nuclear Terrorism,[259]
- 6 countries joining the Global Initiative to Combat Nuclear Terrorism,[260]
- 18 countries and the European Union contributing to the IAEA NSF,[261] and
- 12 new national or regional security centers of excellence created.[262]

Building on this impressive progress, the 2012 summit offers states an opportunity to go beyond the boundaries of the current regime to develop a more globally inclusive and responsive nuclear security system. The 2010 summit focused mainly on gaining compliance with the existing regime, which has slowly evolved in an ad hoc manner and is largely voluntary and nationally focused. New national commitments in 2012 are one area where countries can act individually or in concert with neighbors and allies to take quick, concrete steps to create new nuclear security partnerships, initiatives, and funding streams. Combined with the collective political commitments that all countries are expected to endorse in the "Seoul Communiqué," ambitious national and regional commitments can help lay the groundwork for another

NNSA

Prior to the 2010 Nuclear Security Summit, Chile removed all 18 kilograms of its HEU stockpile. The Chilean Commission of Nuclear Energy worked with the National Nuclear Security Administration to facilitate shipment of the HEU to the United States.

summit in 2014 and the nuclear security agenda for years to come.

Communicating the value of the summit process requires being able to provide an accurate picture of its achievements. This report is one attempt to aggregate and present the unique and important efforts that have taken place over the last two years. Although every attempt was made to be comprehensive, the limitations of relying primarily on open sources coupled with the sensitive nature of nuclear issues and long lead times associated with implementing activities means that some actions may have occurred that are not reported here, particularly if countries are waiting until the Seoul summit to tout their achievements. Reviewing commitment implementation progress is among the objectives of the 2012 summit and is important for understanding how global nuclear security has advanced as a result of the NSS process. After early objections to a standardized commitment-tracking process by some NSS participants, countries agreed to report on their actions at the 2012 summit without specific parameters attached. Although this method offers flexibility, utilizing a common tracking and reporting format would provide a more even, transparent look at commitment implementation. States would be well served by agreeing to a common system ahead of 2014, when the world will want to know how and if their 2010 NSS consensus commitment to "secure all vulnerable nuclear materials" has been met.

At the 2012 summit, participants will face many challenges to continuing to build stronger global nuclear security structures. Without compromising the event's primary focus on nuclear material security, participants will need to successfully integrate radiological security and the nuclear safety and security interface into discussions. They will need to demonstrate the utility of the summit process and maintain cohesion among participants in order to continue working multilaterally to advance nuclear security amid competing global priorities and tight budgets. They also have the added difficulties of conducting these efforts during presidential election years (e.g., United States, Russia, and Republic of Korea) and with the actions of North Korea and Iran occupying much of the media's attention and nuclear-related bandwidth of governments.

The successes from the 2010 summit commitments have helped form a foundation of progress to give states the space to come together in Seoul to begin a push to evolve the regime beyond its current limits to better address new threats. Yet, political will must underpin this momentum for the summit's potential to be realized. With the involvement of heads of state, the summits provide a unique vehicle that holds great potential for breaking down the political barriers and combating bureaucratic inertia. This is necessary to build a stronger global nuclear governance system and material security regime to prevent nuclear terrorism and bolster the security of radioactive materials. The 2012 summit should capitalize on this advantage and begin outlining the future direction of the nuclear security agenda.

APPENDIX I

Glossary of Terms

Convention on the Physical Protection of Nuclear Material (CPPNM): The only international legally binding undertaking in the area of physical protection of nuclear material. Signed in Vienna and New York on March 3, 1980, it establishes measures related to the prevention, detection, and punishment of offenses relating to nuclear material. A diplomatic conference in July 2005 was convened to amend the convention and strengthen its provisions. The amended convention makes it legally binding for states-parties to protect nuclear facilities and material in peaceful domestic use and storage as well as transport. It provides for expanded cooperation between and among states regarding rapid measures to locate and recover stolen or smuggled nuclear material, mitigate any radiological consequences of sabotage, and prevent and combat related offenses. The amendments will take effect once they have been ratified by two-thirds of the states-parties of the convention.

Cooperative Threat Reduction (CTR / Nunn-Lugar): Since 1991, the CTR program has worked to secure and eliminate weapons of mass destruction and their related materials, especially in the states of the former Soviet Union. Initially seen as an immediate response to the chaos as the Soviet Union was collapsing, it later came to be seen as part of a broader effort to keep nuclear weapons and materials out of the hands of terrorists. The program is run by the Defense Threat Reduction Agency in the Department of Defense.

Enrichment: Uranium enrichment increases the percentage of fissile uranium-235 in a batch of nuclear fuel. Low levels of enrichment are suitable for use in civilian nuclear power reactors, while highly enriched uranium (HEU) can be used to build a nuclear weapon.

Fissile material: Material that contains elements whose nuclei are able to be split by neutrons of various speeds. Uranium-233, uranium-235, and plutonium-239 are all fissile materials. Fissile materials undergo fission more easily than other fissionable materials and are more desirable for most reactor types and essential for nuclear explosives.

Global Initiative to Combat Nuclear Terrorism (GICNT): A voluntary association of states, established in 2006, committed to sharing information and expertise in order to prevent nuclear terrorism. Eighty-two states currently participate in the initiative.

Global Partnership Against the Spread of Weapons and Materials of Mass Destruction: An initiative launched in 2002 at the Group of Eight summit in Kananaskis to prevent terrorists or those who harbor them from acquiring or developing nuclear, chemical, radiological, and biological weapons; missiles; and related materials, equipment, and technology.

Global Threat Reduction Initiative (GTRI): A collaborative program aimed at reducing and protecting vulnerable nuclear and radiological materials located at civilian sites worldwide. Launched in 2004, the GTRI helps the U.S. Department of Energy achieve its nuclear security goal to prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and other acts of terrorism by repatriating or otherwise securing nuclear fuel and converting reactors to use new, more proliferation-resistant technology. Three key subprograms of the GTRI—convert, remove, and protect—provide a comprehensive approach to denying terrorists access to nuclear and radiological materials. The program is run by the National Nuclear Security Administration.

Highly Enriched Uranium (HEU): Uranium that has been processed to increase the proportion of the U-235 isotope to more than 20 percent.

HEU is required for the construction of a gun-type nuclear device, the simplest type of nuclear weapon. The greater the proportion of U-235, i.e., the higher the enrichment level, the less material that is needed to cause a nuclear detonation. Weapons-grade uranium generally refers to uranium enriched to at least 90 percent, but material of far lower enrichment levels can be used to create a nuclear explosive device.

IAEA Nuclear Security Fund: A voluntary funding mechanism, to which International Atomic Energy Agency (IAEA) member states are called on to contribute. The fund was established to support, among others things, the implementation of nuclear security activities to prevent, detect, and respond to nuclear terrorism. The fund's lifetime has been extended twice; the current Nuclear Security Plan is scheduled to run through 2013.

International Atomic Energy Agency (IAEA): International organization based in Vienna charged with monitoring and safeguarding nuclear material and facilities under the nuclear Nonproliferation Treaty and with helping states pursue peaceful nuclear programs through technical cooperation. It was set up as the world's Atoms for Peace organization in 1957 within the UN structure. The IAEA Secretariat is a team of 2,200 multidisciplinary professional and support staff from more than 90 countries. The agency is led by Director-General Yukiya Amano and six deputy directors-general who head the major departments.

International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT): International agreement opened for signature in 2005 that criminalizes the planning, threatening, or implementation of acts of nuclear terrorism and requires states-parties to pass national legislation to that effect.

International Physical Protection Advisory Service (IPPAS): This service was created by the IAEA in order to assist states in strengthening nuclear security within their borders. During an IPPAS review, IAEA experts will examine facilities within a country where nuclear or radioactive materials are kept. They will compare the facilities' systems of physical protection with international guidelines and best practices, and make suggestions for follow-on activities or security upgrades.

Megaports Initiative: A U.S. government program that works with foreign partners to enhance security at ports around the world. The initiative helps equip major ports with radiation detection equipment, as well as provide training for foreign personnel. Foreign cooperation with the initiative is typically formalized by signing a bilateral "Megaports agreement." The program is run by the National Nuclear Security Administration.

2010 Nuclear Security Summit (NSS): A meeting of 47 national delegations and the European Union, the International Atomic Energy Agency (IAEA), and the United Nations held in Washington, DC, April 12–13, 2010, to enhance international cooperation in preventing nuclear terrorism. The participants agreed on a communiqué and a work plan. In their national statements, many states described specific steps they will take to advance nuclear security. The summit was first proposed by President Barack Obama in an April 2009 speech in Prague where he outlined his vision of a world free of nuclear weapons and nuclear threats.

Nuclear Smuggling Outreach Initiative (NSOI): A U.S. government program which collaborates with foreign governments to prevent, detect, and respond to incidents of nuclear smuggling. The program is housed in the State Department's Bureau of International Security and Nonproliferation.

Research reactor: Small nuclear reactors used for scientific research and the production of radioactive materials used in medicine and industry. Many utilize highly enriched uranium as a fuel, unlike larger civilian power reactors, which operate on low enriched uranium.

Resolution 1540: A UN Security Council resolution passed in 2004 mandating that states establish domestic controls to prevent nonstate actors from acquiring nuclear, chemical, and biological weapons or related materials.

World Institute for Nuclear Security (WINS): A nongovernmental body that aims to provide a forum for nuclear security professionals to discuss and exchange best security practices. As of August 2010, WINS has over 400 corporate and individual members from over 50 countries.

APPENDIX II

Highlights of the National Commitments made at the Nuclear Security Summit

Armenia: Ratified International Convention on Suppression of Acts of Nuclear Terrorism, passed new export control law

Argentina: Joined the Global Initiative to Combat Nuclear Terrorism; moving toward the ratification of the International Convention on Suppression of Acts of Nuclear Terrorism and 2005 Amendment of the Convention on Physical Protection of Nuclear Materials

Australia: Moving toward the ratification of the International Convention on Suppression of Acts of Nuclear Terrorism

Belgium: Contributing $300,000 to International Atomic Energy Agency's Nuclear Security Fund

Canada: Returning a large amount of spent highly enriched uranium fuel from their medical isotope production reactor to the United States; championing the extension of the G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction; funding highly enriched uranium removals from Mexico and Vietnam; hosting and funding a World Institute of Nuclear Security best practices workshop in Ottawa; unveiling $100 million in new bilateral security cooperation with Russia

Chile: Removed all highly enriched uranium (18kgs) in March 2010

China: Announce cooperation on nuclear security Center of Excellence

Egypt: Passed new comprehensive nuclear law in March 2010 that includes nuclear security, criminalization of sabotage and illicit trafficking provisions as well as envisaging an independent regulatory authority

France: Ratifying the 2005 Amendment to the Convention on Physical Protection of Nuclear materials; inviting an International Physical Protection Advisory Service security review from the International Atomic Energy Agency; incorporating training in nuclear security at the European Nuclear Safety Training and Tutoring Institute and the International Nuclear Energy Institute (announced during March 2010 Paris nuclear energy conference)

Finland: Invited an International Physical Protection Advisory Service security review from the International Atomic Energy Agency

Germany: Moving toward ratifying 2005 Amendment of the Convention on Physical Protection of Nuclear Materials

Georgia: Signed instrument of approval for International Convention for the Suppression of Acts of Nuclear Terrorism on April 7, 2010

India: Announcing the creation of a Nuclear Energy Center with a nuclear security component

Italy: Signed a Megaports agreement (to install detection equipment at ports) with U.S.; establishing a school of nuclear security in Trieste, in collaboration with the Abdus Salam International Center for Theoretical Physics and the International Atomic Energy Agency (IAEA), to train nuclear personnel from developing countries

Japan: Launching an integrated regional support center; research and development on detection and forensics; contributing new resources to International Atomic Energy Agency's Nuclear Security Fund; hosting and funding a World Institute of Nuclear Security best practices conference

Kazakhstan: Converting a highly enriched uranium research reactor and eliminating remaining highly enriched uranium; cooperative work on BN-350 rector shutdown and fuel security; hosting a Global Initiative Activity in June; considering a International Nuclear Security Training Center.

Malaysia: Passed new export control law

Mexico: Converting a highly enriched uranium research reactor and eliminating remaining highly enriched uranium working through IAEA

New Zealand: Contributing to International Atomic Energy Agency's Nuclear Security Fund; contributing to the U.S. Nuclear Smuggling Outreach Initiative

Norway: Contributing $3.3 million over the next four years to the IAEA nuclear security fund (flexible funds for use for activities in developing countries); contributing $500,000 in additional support to Kazakhstan's efforts to upgrade portal monitors to prevent nuclear smuggling as part of the Global Initiative to Combat Nuclear Terrorism

Philippines: Joining the Global Initiative to Combat Nuclear Terrorism

Republic of Korea: Hosting 2012 Nuclear Security Summit; hosting a Global Initiative activity

Russia: Signing Plutonium Disposition protocol; ending plutonium production; contributing to International Atomic Energy Agency's Nuclear Security Fund

Saudi Arabia: Hosting a UNSCR 1540 conference for Gulf Cooperation Council

Thailand: Joining the Global Initiative to Combat Nuclear Terrorism

Ukraine: Removing all highly enriched uranium by next Summit—half of it by year's end

United Arab Emirates: Signed a Megaports Agreement with the U.S.

United Kingdom: Contributing $6 million to International Atomic Energy Agency's Nuclear Security Fund; inviting an International Physical Protection Advisory Service security review from the International Atomic Energy Agency; ratification of the International Convention on Suppression of Acts of Nuclear Terrorism and 2005 Amendment of the Convention on Physical Protection of Nuclear Materials

Vietnam: Converting a highly enriched uranium research reactor; joining the Global Initiative to Combat Nuclear Terrorism

IAEA: Completing final review of the next revision of INFCIRC 225, the IAEA nuclear physical security guidance document

APPENDIX III

Nuclear Security Summit National Statement of the United States

In April 2009, President Obama addressed the citizens of Prague and the world, stating clearly and with conviction America's commitment to seek the peace and security of a world free of nuclear weapons. Recognizing this goal is not immediately achievable, the President laid the groundwork to ensure that through the steady accumulation of progress we move continually along the path toward this critical objective.

In that speech, the President identified the risk of nuclear terrorism as the most immediate and extreme threat to global security, called for an international four-year effort to secure vulnerable nuclear material, and announced his intent to host a Nuclear Security Summit. Over the past year, with the leadership of President Obama, we have made progress on this unprecedented call to action. At the United Nations Security Council last fall, we unanimously passed Resolution 1887 endorsing the goal of securing all nuclear materials and preventing the spread and use of nuclear weapons.

This Nuclear Security Summit takes place on April 12-13, 2010. Leaders from 47 nations as well as the United Nations, the International Atomic Energy Agency and the European Union will gather in Washington, DC – the largest gathering of heads of state and government in Washington's history.

Our objective is clear: ensure that terrorists never gain access to plutonium or highly-enriched uranium – the essential ingredients of a nuclear weapon. The challenge we face is how to lock down the over 2000 tons of plutonium and highly enriched uranium exist in dozens of countries with a variety of peaceful as well as military uses. The consequences of a nuclear detonation, or even an attempted detonation, perpetrated by a terrorist or criminal group anywhere in the world would be devastating. Not only could there be an enormous loss of life but there would also be overwhelming economic, political and psychological consequences that would reverberate worldwide.

Just as the United States is not the only country that would suffer from nuclear terrorism, we cannot prevent it on our own. The goal of the Nuclear Security Summit is to highlight this global threat and agree to steps we can take together to secure nuclear material and prevent illicit nuclear trafficking. The Nuclear Security Summit provides an occasion for the United States to highlight some of its recent and future efforts to show leadership in improving the security of nuclear materials both at home and abroad.

- **Domestic Nuclear Security:** Our first priority is to ensure that nuclear materials and facilities in the United States are secure. Through sustainable security programs, including a continual evaluation of the threat, inspections, and emergency response, preparedness and coordination programs, the United States keeps its materials secure. Following September 11, 2001, security at domestic facilities was enhanced and is evaluated on a continuous basis. Most recently, on March 22, 2010, the Highly Enriched Uranium Materials Facility in Oak Ridge, Tennessee—an ultra-secure uranium warehouse that replaces multiple aging facilities with a single, state-of-the-art storage facility— came on-line as one measure of our increased security posture.

As part of our ongoing efforts to evaluate the security of its nuclear facilities, we will request an advisory mission from the International Atomic Energy Agency's International Physical Protection Advisory Service to review physical protection at the National Institute of Standards and Technology's Center for Neutron Research, licensed by the Nuclear Regulatory Commission. The Center's reactor supports a broad

program of research using neutron techniques, and develops and applies new neutron measurement technologies. NIST has committed to convert its reactor from highly enriched uranium to a new low enriched uranium fuel once that has been tested and approved for use. This advisory mission will provide an independent, confidential comparison of the physical protection regulations and their implementation with international guidelines and best practices.

- **Ratifying Conventions:** The United States has accelerated efforts to complete ratification procedures for the two key international treaties governing nuclear security, the International Convention for the Suppression of Acts of Nuclear Terrorism and the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material. Legislation that brings U.S. laws into line with these treaties has been submitted to the Congress. Once laws are in place implementing the conventions, the United States will deposit its instruments of ratification.
- **Minimizing Highly Enriched Uranium:** In 2009, the United States completed conversion of all 20 of our highly-enriched-uranium-fueled reactors that could be converted to use low enriched uranium fuel. There are six remaining highly-enriched-uranium-fueled reactors in the United States that will be converted to use low enriched uranium fuel once acceptable fuel has been developed.
- **Plutonium Disposition:** The United States and Russia have just signed the Protocol to the Plutonium Management and Disposition Agreement, which commits both countries to eliminate 68 metric tons of plutonium (34 each) from their weapons programs—enough material for approximately 17,000 nuclear weapons combined. Furthermore, the United States is in the final stages of approval to bring up to 100 kilograms of plutonium from sites of concern into the United States pending disposition, thereby eliminating vulnerable, weapons-usable plutonium in certain cases where no other solution is available.
- **Nuclear Detection:** Due to shortages in materials for current neutron detectors, the United States is working to develop and deploy new neutron detection technologies through an aggressive program of research, development, test, and evaluation. The time frame for this effort has been shortened from 5 years to 18 months.
- **Nuclear Forensics:** With the emerging discipline of nuclear archeology, the United States has launched an international effort to develop nuclear forensics library, exercises, common lexicons, and other foundational elements that will provide the framework for cooperation between governments investigating the illicit use of nuclear materials.
- **Sharing Best Practices:** Nuclear security can be advanced through sharing best practices among those with responsibility for securing and accounting for nuclear materials in the private and public sectors. We are working with Russia and other members to turn the Global Initiative to Combat Nuclear Terrorism into a durable international institution. The United States strongly supports the World Institute for Nuclear Security as an effective forum for sharing best security practices, based on its broad membership in 44 countries, representing private industry, police, government agencies, state regulators and national laboratories. We will continue to provide financial support and expertise and encourage other countries to do so as well.
- **International Cooperation:** Working within existing legal and multilateral nuclear security frameworks, U.S. nuclear security cooperative activities help states worldwide meet their nuclear security obligations, uphold the highest international nuclear security recommendations and standards, and maximize the peaceful benefits of nuclear materials while reducing the risks of their misuse. In its Fiscal Year 2011 budget request, the U.S. has requested the largest amount ever – $1.6 billion, a 31% increase over the previous year – for these programs across multiple agencies working with countries around the world.
- **United Nations Security Council Resolution 1540:** In 2009 the UN Security Council created a committee to assist states in implementing their obligations under this universal, binding resolution. The United States has proposed, and intends to contribute to, a voluntary fund to help countries meet the obligations this resolution places on them, and to match them up with wide range of national, international, and nongovernmental sources of assistance.
- **Nuclear Security Programme of the International Atomic Energy Agency:** In 2009, the United States led efforts to gain agreement of the 150-plus nations of the International Atomic Energy Agency to establish for the first time a dedicated budget line for nuclear security, which had until then been funded exclusively through voluntary contributions from member states. The U.S. voluntary contribution to this effort has risen 59% since 2007.
- **G8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction:** In 2002, under the leadership of Canada, the G8 committed $20 billion over ten years to stop the spread of weapons of mass destruction. Eight years later, the 23 G8 Partners have allocated more than $18 billion to this effort. We have made progress with Russia to eliminate stocks of chemical weapons and to dismantle decommissioned nuclear submarines. We are ready to join with our Canadian colleagues and call for another ten-year extension with an expanded scope/mission and to commit up to another $10 billion towards new projects, including expanding our efforts to improving nuclear security to countries not previously eligible for G8 assistance.

NOTES

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