



# Securing Nuclear Materials: The 2010 Summit and Issues for Congress

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## Summary

In an April 2009 speech in Prague, President Obama pledged that his Administration would launch “a new international effort to secure all vulnerable nuclear material around the world within four years.” To motivate world leaders to achieve this goal, the President hosted a Nuclear Security Summit in Washington, DC, on April 12-13, 2010. Leaders of 47 countries attended the summit, including many heads of state. Attendees represent a wide geographic range of states and nuclear capabilities, and include China, India, Israel, and Pakistan. The summit resulted in a joint statement saying that international cooperative action is necessary to prevent an act of nuclear terrorism. Summit attendees also pledged to improve nuclear security standards, bring international agreements into force, and share best practices.

Nuclear security measures refer to a wide range of actions to prevent theft or diversion of nuclear material or sabotage at an installation or in transit. They could include physical protection measures, material control and accounting, personnel reliability screening, and training. A broader understanding of nuclear security also includes measures to prevent and detect illicit trafficking—cargo inspections, border security, and interdiction measures.

The U.S. government has worked for more than a decade both domestically and in partnership with other countries to address this problem through multiple programs at the Departments of Defense, Energy, Homeland Security, and State. The International Atomic Energy Agency has also played a lead role in these efforts, particularly since the 9/11 terrorist attacks.

Congress will continue to decide on funding for the U.S. domestic and international programs focused on nuclear material security and nuclear terrorism prevention. Congress is also likely to assess implementation of the administration’s goal to secure nuclear materials by the end of 2013. The Obama Administration’s FY2011 congressional budget request proposes overall increases in funding for nuclear security-related accounts, with the stated purpose of ramping up programs to meet the President’s four-year goal.

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## Introduction

In an April 2009 speech in Prague, President Obama said that nuclear terrorism is the “most immediate and extreme threat to global security,” and announced “a new international effort to secure all vulnerable nuclear material around the world within four years.”<sup>1</sup> To mobilize world leaders to meet this goal, the President hosted a Nuclear Security Summit in Washington, DC, on April 12-13, 2010. Heads of State from 47 countries gathered to lay out their priorities and focus the world’s attention on the issue.

The Obama Administration’s April 2010 Nuclear Posture Review Report confirms nuclear terrorism as topping the list of nuclear dangers to the United States: “The vulnerability to theft or seizure of vast stocks of such nuclear materials around the world, and the availability of sensitive equipment and technologies in the nuclear black market, create a serious risk that terrorists may acquire what they need to build a nuclear weapon.”<sup>2</sup>

Securing nuclear materials is seen by many as crucial to preventing an act of nuclear terrorism.<sup>3</sup> The nuclear terrorism threat can be divided into four categories: an attack using a stolen nuclear weapon, an attack using fissile material in an improvised nuclear device (IND), an attack using a radiological dispersal device (RDD), and sabotage against a nuclear power plant.<sup>4</sup> Nuclear security practices would be necessary to prevent each of these scenarios.

The IND scenario would require that a terrorist group obtain weapons-usable fissile material (highly enriched uranium or plutonium). Because production of fissile material is costly and equipment relatively difficult to obtain, many believe that terrorist groups would not be able to produce weapon-usable nuclear material and would therefore need to steal or purchase the material or weapon from a state. Therefore, the United States has made it a policy priority to secure nuclear material where it is housed or remove the material from sites around the world.

Nuclear security measures refer to a wide range of actions to prevent theft or diversion of nuclear material or sabotage at an installation or in transit. They could include physical protection measures, material control and accounting, personnel reliability screening, and training. A broader understanding of nuclear security also includes measures to prevent and detect illicit trafficking—cargo inspections, border security, and interdiction measures. Another aspect, “nuclear security culture,” describes personnel attitudes towards the importance of nuclear security practices in their daily work.

The United States government has worked both domestically and in partnership with other countries to address this problem through multiple programs at the Departments of Defense, Energy, Homeland Security, and State. The International Atomic Energy Agency has also played a lead role in these efforts, particularly since the 9/11 terrorist attacks. Congressional interest in this

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<sup>1</sup> Remarks by President Obama, Prague, April 5, 2009. Full text at [http://www.whitehouse.gov/the\\_press\\_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/](http://www.whitehouse.gov/the_press_office/Remarks-By-President-Barack-Obama-In-Prague-As-Delivered/).

<sup>2</sup> <http://www.defense.gov/npr/docs/2010%20Nuclear%20Posture%20Review%20Report.pdf>.

<sup>3</sup> This report does not assess the likelihood of a terrorist nuclear attack. For an overview, see CRS Report RL32595, *Nuclear Terrorism: A Brief Review of Threats and Responses*, by Jonathan Medalia.

<sup>4</sup> Ferguson, Potter, et al., *The Four Faces of Nuclear Terrorism*. October 2005, <http://cns.miis.edu/books/4faces.htm>.

issue is centered around preventing a nuclear terrorist attack against the United States and providing funding for related programs.

## **The Summit**

President Obama has said that at the April 2010 Nuclear Security Summit, “we will advance our goal of securing all of the world’s vulnerable nuclear materials within four years.”<sup>5</sup> Secretary of State Hillary Clinton has called the summit “an unprecedented gathering that will help promote a common understanding of the threat of nuclear terrorism and build international support for effective means of countering that threat.”<sup>6</sup>

Leaders of 47 countries attended the summit, including many heads of state.<sup>7</sup> The attendees represented a wide geographic range of states. Their experience with nuclear security issues ranges from countries that possess nuclear weapons, those that have nuclear energy programs, and others that are potential transshipment points for illicit trafficking. Representatives from the IAEA, the United Nations, and the European Union also attended.

The summit resulted in a joint statement with a pledge to improve nuclear security standards and share best practices, and confirmed agreement that international action is necessary to prevent an act of nuclear terrorism. Vice President Biden described the timing of the meeting thus, “We cannot wait for an act of nuclear terrorism before coming together to share best practices and raise security standards, and we will seek firm commitments from our partners to do just that.”<sup>8</sup>

The summit concentrated on the goal of securing weapons-usable nuclear materials (highly enriched uranium and plutonium), and did not address nuclear weapons security issues specifically. Focusing on nuclear materials may have been in part to secure the participation of states most sensitive to discussing nuclear weapons issues. Radiological material security was also not emphasized, although many nuclear security practices relevant to weapons-usable nuclear materials are also relevant to other nuclear materials, including radiological sources in the civilian fuel cycle.

## **Expected Summit Outcomes**

Summit participants discussed the nuclear terrorism threat and “steps that can be taken together to secure vulnerable materials, combat nuclear smuggling and deter, detect, and disrupt attempts at

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<sup>5</sup> President Barack Obama Delivers Remarks at Suntory Hall, Tokyo, Japan, *CQ Transcripts*, November 14, 2009.

<sup>6</sup> Secretary of State Hillary Clinton Remarks at the United States Institute of Peace, October 21, 2009, <http://www.state.gov/secretary/rm/2009a/10/130806.htm>.

<sup>7</sup> Attendees include Algeria, Argentina, Armenia, Australia, Belgium, Brazil, Canada, Chile, China, the Czech Republic, Egypt, Finland, France, Georgia, Germany, India, Indonesia, Israel, Italy, Japan, Jordan, Kazakhstan, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Philippines, Poland, the Republic of Korea, the Russian Federation, Saudi Arabia, Singapore, Switzerland, South Africa, Spain, Sweden, Thailand, Turkey, United Arab Emirates, the United Kingdom, Ukraine, and Vietnam. White House Press Briefing, April 6, 2010.

<sup>8</sup> “The Path to Nuclear Security: Implementing the President’s Prague Agenda,” Remarks of Vice President Joseph Biden at the National Defense University, February 18, 2010, <http://www.whitehouse.gov/the-press-office/remarks-vice-president-biden-national-defense-university>.

nuclear terrorism.”<sup>9</sup> The summit also highlighted the role of the IAEA and the nuclear industry in promoting nuclear security best practices.

According to White House summaries, the outcome of the summit was to be a communiqué “pledging efforts to attain the highest levels of nuclear security, which is essential for international security as well as the development and expansion of peaceful nuclear energy worldwide.”<sup>10</sup> Summit documents endorse the key international treaties and multilateral initiatives dealing with nuclear security (detailed below). President Obama, in an April 5, 2010, interview said he expected “a communiqué that spells out very clearly, here’s how we’re going to achieve locking down all the nuclear materials over the next four years, and different countries, depending on their circumstances and vulnerabilities, taking very specific steps in order to assure that that happens.”<sup>11</sup> The summit documents included a work plan with specific follow-up steps.<sup>12</sup> A follow-up summit to measure progress on implementation is planned for 2012 in South Korea.

Additional benefits resulted from the meeting apart from summit policy documents. In the run-up to the summit, participating governments examined their own nuclear security and export control practices, their use of weapons-usable materials in the civilian fuel cycle, and in some cases, their ability to provide nuclear security assistance to other countries. This preparatory process could have spurred some countries to make progress to present at the summit<sup>13</sup>—for example, just prior to the summit, Chile, with U.S. assistance, removed the remaining HEU at research facilities;<sup>14</sup> Malaysia passed national export control legislation;<sup>15</sup> Ukraine announced on April 12 that it would remove all HEU from its territory and convert its research reactor to LEU fuel, with U.S. assistance, by 2012;<sup>16</sup> and Canada’s Prime Minister announced the return of HEU spent fuel to the United States.<sup>17</sup> Canada and the United States announced a trilateral agreement with Mexico to convert its HEU-fueled research reactor to LEU fuel.<sup>18</sup> The United States and Russia reached agreement on plutonium disposition,<sup>19</sup> and Russia announced a shut-down of its last remaining plutonium production reactor. Many of these initiatives had been long-term objectives of the

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<sup>9</sup> “Addressing the Nuclear Threat: Fulfilling the Promise of Prague at the L’Aquila Summit,” White House Press Release, July 8, 2009, [http://www.whitehouse.gov/the\\_press\\_office/Addressing-the-Nuclear-Threat-Fulfilling-the-Promise-of-Prague-at-the-LAquila-Summit/](http://www.whitehouse.gov/the_press_office/Addressing-the-Nuclear-Threat-Fulfilling-the-Promise-of-Prague-at-the-LAquila-Summit/).

<sup>10</sup> *Ibid.*, White House Press Release, July 8, 2009. The full text of the communiqué can be found at <http://www.whitehouse.gov/the-press-office/communiqu-washington-nuclear-security-summit>.

<sup>11</sup> “Excerpts from Obama Interview,” *The New York Times*, April 5, 2010.

<sup>12</sup> <http://www.whitehouse.gov/the-press-office/work-plan-washington-nuclear-security-summit>.

<sup>13</sup> A full list can be found at “Highlights of the National Commitments Made at the Nuclear Security Summit,” White House Press Release, April 13, 2010, <http://www.whitehouse.gov/the-press-office/highlights-national-commitments-made-nss>.

<sup>14</sup> “Ahead of Nuclear Summit, NNSA Announces Removal of All Highly Enriched Uranium from Chile,” NNSA Press Release, April 8, 2010, <http://nnsa.energy.gov/news/2894.htm>.

<sup>15</sup> “Malaysia Finally Adopts Export Controls,” ISIS Report, April 9, 2010, <http://isis-online.org/isis-reports/detail/malaysia-finally-adopts-national-export-controls/>.

<sup>16</sup> Fact Sheet on Ukraine’s Non-proliferation Efforts, the White House website, April 12, 2010, [http://www.whitehouse.gov/sites/default/files/Fact%20Sheet%20on%20Ukraine%20HEU%20announcement\\_FINAL%20\(4-12-10\).pdf](http://www.whitehouse.gov/sites/default/files/Fact%20Sheet%20on%20Ukraine%20HEU%20announcement_FINAL%20(4-12-10).pdf).

<sup>17</sup> “PM announces a nuclear cooperation project with the United States to further secure inventories of spent highly enriched uranium,” press release, Office of the Prime Minister of Canada, April 12, 2010, <http://www.pm.gc.ca/eng/media.asp?category=1&id=3278>.

<sup>18</sup> “Mexico to convert reactor to low-enriched uranium,” *Associated Press*, April 13, 2010.

<sup>19</sup> <http://www.whitehouse.gov/the-press-office/highlights-national-commitments-made-nss>.

United States, and the summit seems to have moved stalled negotiations forward. Obama Administration officials said that almost every country came to the summit with something new that they pledged to accomplish on nuclear security in their country.

The composition of the meeting is also important. Three states not party to the Non-Proliferation Treaty (NPT) were in attendance—Pakistan, Israel,<sup>20</sup> and India. Holding discussions of nuclear security outside the NPT context allows these countries to participate. Egypt's participation was also a key endorsement of the nuclear security agenda due to its vocal role in the Non-Aligned Movement, where skepticism of the nuclear terrorism threat runs highest. In addition, the Russian Federation said it would be helping the United States prepare the groundwork for the conference. The United States and Russia have a history of cooperating on nuclear material security and nuclear terrorism prevention, announcing the Global Initiative to Combat Nuclear Terrorism together, and fulfilling bilateral nuclear security pledges under the Bratislava Initiatives. Since Russia holds the world's largest stockpiles of weapons-usable nuclear material, it may be beneficial to continue this partnership at a high political level to ensure follow-through with past pledges and further progress in the future.

In addition to nuclear material security goals, the summit has the potential to strengthen the overall nonproliferation regime. China, for example, has in the past been cautious in discussing these issues but announced the creation of a nuclear security "Center of Excellence" to share best practices with developing countries. Participation of the non-NPT states in discussions about the nuclear terrorism threat may lay the groundwork for future discussions on nonproliferation and export control initiatives. Some analysts in India, for example, are changing the conventional thinking about some aspects of nonproliferation (i.e., as a common good rather than a way to suppress their weapons ambitions). India announced it would create a regional nuclear energy training center with a nuclear security component.<sup>21</sup> At the highest political level, countries will be questioning how their country can help prevent a nuclear terrorism attack from occurring.

## **Foreign Reactions to the Summit**

In addition to Russia, Japan played a prominent diplomatic role in preparing for the summit. In the November 13, 2009, U.S.-Japan Joint Statement, President Obama and Prime Minister Hatoyama pledged to promote regional efforts to strengthen nuclear security. To this end, Japan hosted a nuclear security conference for Asian countries in January 2010 and a preparatory meeting for the summit in December 2009.

European countries have also expressed support. For example, Annex 3 of the US-EU Joint Statement of November 3, 2009 says:

We express our support for the convening of the April 2010 Nuclear Security Summit, recognizing that the unauthorized trade in and use of nuclear materials is an immediate and serious threat to global security. We look forward to concrete proposals to increase the

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<sup>20</sup> The Israeli government announced on April 8, 2010, that Deputy Prime Minister Dan Meridor planned to attend the summit instead of Prime Minister Netanyahu. Press reports quote an Israeli official as saying that the Prime Minister decided not to attend due to concerns that Egypt or Turkey would use the forum to call on Israel to accede to the Non-Proliferation Treaty. However, some analysts believe that Netanyahu may not be ready to respond to recent White House requests for actions related to jump-starting the Israeli-Palestinian peace process. "Netanyahu to Skip Obama Summit," Politico, April 8, 2010, <http://www.politico.com/news/stories/0410/35561.html>.

<sup>21</sup> "India N-Centre to Have 4 Schools," *The Asian Age*, April 14, 2010.

security of vulnerable nuclear materials, which could include measures to effectively investigate and prosecute instances where material has been unlawfully diverted.

Japan and the EU countries have been strong supporters of nuclear security efforts, and contributors to the voluntary IAEA Nuclear Security Fund in the past decade. However, although all countries may agree that nuclear terrorism should be prevented, many developing countries, particularly those without nuclear programs, do not view nuclear terrorism as a threat to their country, see its occurrence as unlikely, or simply are occupied with other priorities. However, others argue that it is important to gain the participation of all states, as any country could potentially be used as transshipment point or may choose to develop nuclear-related facilities on their territory one day. Administration officials said that preparations for the summit and the meeting itself have bridged gaps in threat perceptions.<sup>22</sup>

## **The Non-Proliferation Treaty and Nuclear Security**

Due to the timing of the summit—less than one month before the 2010 Review Conference for the Nuclear Non-Proliferation Treaty—some countries, at least initially, were concerned that the summit was meant to overshadow the Review Conference. The NPT Review Conferences traditionally do not include in-depth discussion of nuclear material security or nuclear terrorism issues. The traditional three pillars of the NPT are nuclear disarmament, nuclear nonproliferation, and nuclear energy. Some states have proposed that in the post-9/11 security environment, nuclear security issues should be a part of NPT discussions. UK Foreign Minister Milliband proposed that nuclear security become the “fourth pillar” of the NPT.<sup>23</sup> Also, EU nonproliferation representative Annalisa Giannella has said that since the NPT requires states to prevent proliferation, “one can argue that this obligation also implies the obligation to protect nuclear or radiological material.”<sup>24</sup>

However, some developing countries have resisted anything that may be perceived as an additional commitment under the NPT until further disarmament steps are taken. The Obama Administration decided to hold a separate summit on this topic perhaps partially due to this resistance, but also to include non-NPT states in the nuclear security summit and highlight the problem of nuclear diversion to terrorists as a distinct problem. According to U.S. officials, this was not meant to undermine in any way the NPT Review Conference, but to focus narrowly on the problem of nuclear terrorism. Administration officials have been clear in saying that the Nuclear Security Summit is distinct from the NPT Review Conference.<sup>25</sup> Nevertheless, due to the timing of the summit, some NPT member states may have had the opportunity to informally discuss review conference policy or other urgent nonproliferation issues at the head-of-state level in side meetings.

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<sup>22</sup> Press Briefing by Rhodes, Samore, Holgate, Washington Convention Center, April 13, 2010.

<sup>23</sup> *Road to 2010*, <http://www.cabinetoffice.gov.uk/media/224864/roadto2010.pdf>.

<sup>24</sup> Daniel Horner, “Nuclear Security Summit Planned for March,” *Arms Control Today*, September 2009.

<sup>25</sup> “Taking Stock of the NPT: An Interview With U.S. Special Representative Susan Burk,” *Arms Control Today*, March 2010.

## What Is “Nuclear Security”?

The 2010 Nuclear Security Summit focused on efforts to secure nuclear weapons-usable materials (highly enriched uranium and plutonium), and broader efforts to prevent nuclear terrorism. However, the phrase “nuclear security” is often associated with the security of nuclear weapons.<sup>26</sup> “Nuclear security” has also been used to describe the role of nuclear weapons in national security, including maintaining the U.S. nuclear weapons arsenal. For example, Vice President Biden’s March 2010 speech at National Defense University, “Pathways to Nuclear Security,” addressed both stockpile stewardship and nuclear nonproliferation efforts. The NNSA refers to a modernized U.S. nuclear weapons complex as the “21<sup>st</sup> Century Nuclear Security Enterprise.” NNSA Administrator Thomas D’Agostino testified that the enterprise’s future “range of missions include stockpile stewardship, nonproliferation and disarmament, arms control and treaty verification, counterterrorism and emergency response, nuclear forensics, and Naval nuclear propulsion.”<sup>27</sup> Still others use the term “nuclear security” to characterize a vision of a safer world without nuclear weapons.<sup>28</sup>

Nuclear security for the purpose of the summit, and in the International Atomic Energy Agency’s usage, refers to a wide range of measures to prevent theft or diversion of nuclear material or sabotage at civilian or military facilities. The measures could protect material at an installation or in transit, such as physical protection measures, material control and accounting, personnel reliability screening, and training. A broader understanding of nuclear security also includes measures to detect illicit trafficking—cargo inspections, customs and border security. It would involve establishing or strengthening national export controls as well as improving international cooperation to identify and interdict shipments.

Another aspect, “nuclear security culture,” describes personnel attitudes toward the importance of nuclear security practices in their daily work. This is known as the “human factor” and recognizes that technology-based physical protection measures are only as effective as the people who are running them. The “insider threat” at nuclear facilities is a worker’s knowledge of facility practices that could be used to aid terrorists or smugglers in obtaining material through diversion.

### IAEA Definitions of Nuclear Security

**Nuclear Security:** The prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear or other radioactive substances or their associated facilities. It should be noted that “nuclear security” includes “physical protection,” as that term can be understood from consideration of the Physical Protection Objectives and Fundamental Principles, the CPPNM and the Amendment to the CPPNM.

**Nuclear Security Culture:** The assembly of characteristics, attitudes and behavior of individuals, organizations and institutions which serves as a means to support and enhance nuclear security.

**Source:** *Nuclear Security Culture Implementing Guide*, IAEA Nuclear Security Series No. 7, 2008, [http://www-pub.iaea.org/MTCD/publications/PDF/Pub1347\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Pub1347_web.pdf).

<sup>26</sup> Criticism by other countries (and domestically) of the U.S. nuclear security record often cites security lapses in custody of nuclear weapons themselves such as the 2007 Minot incident. See “Safety, Security and Management Issues” in CRS Report RL33640, *U.S. Strategic Nuclear Forces: Background, Developments, and Issues*, by Amy F. Woolf.

<sup>27</sup> Thomas D’Agostino, Testimony before the House Appropriations Committee, Subcommittee on Energy and Water, March 4, 2010, <http://nnsa.energy.gov/news/2855.htm>.

<sup>28</sup> [http://www.nuclearsecurityproject.org/site/c.mjJXJbMMIoE/b.3534665/k.5828/About\\_the\\_Project\\_Index.htm](http://www.nuclearsecurityproject.org/site/c.mjJXJbMMIoE/b.3534665/k.5828/About_the_Project_Index.htm).

## Challenges to Achieving the Four-Year Goal

The four-year goal set out by the President Obama of securing “all vulnerable” nuclear materials around the world raises a number of questions, especially—what is meant by vulnerable and what is an acceptable definition of “secure.” Senator Lugar has defined nuclear security as “a satisfactory level of accountability, transparency, and safety.”<sup>29</sup> The highest priority for the United States is to secure weapons-usable material (e.g., that which can be used directly in a nuclear explosive device). This material could be in military fissile material stockpiles or in the civilian fuel cycle. U.S. government efforts will likely start with accelerated activities to secure these materials (see “Nuclear Security and the FY2011 Congressional Budget Request”).

One potential obstacle to progress is the sheer volume and wide geographic distribution of the material to be secured. The International Panel on Fissile Material estimates that there are 1,600 tons of HEU and 500 tons of separated plutonium in stocks worldwide.<sup>30</sup> The scope of the problem underlines the Obama Administration’s approach that the four-year goal cannot be met by U.S. assistance programs alone, but requires all states to examine their own nuclear security practices and commit their own resources to improving nuclear security.

A challenge to measuring success in reaching the four-year goal will be to establish a baseline accounting of current nuclear material holdings and to improve transparency about current nuclear security practices. To this end, the 2006 National Security Presidential Directive 48 (NSPD-48/HSPD-17) established the Nuclear Materials Information Program (NMIP). NMIP is an interagency effort managed by DOE to “consolidate information from all sources pertaining to worldwide nuclear materials holdings and their security status into an integrated and continuously updated information management system.”<sup>31</sup> From open sources, it is not clear that this data collection is complete at this time, or to what extent this inventory includes threat assessments. The IAEA has kept inventory of nuclear material at sites under safeguards (declared nuclear material in non-nuclear weapon states party to the NPT). However, for the nuclear weapon states and non-NPT states, there is little data on inventories.

The majority of states in possession of weapons-usable material are participating in the Nuclear Security Summit, with the prominent exceptions of North Korea, Iran, and Belarus. Each of these cases poses a unique challenge. Belarus houses HEU research reactor fuel, but the United States has done security upgrades on the site, and the material is scheduled to be returned to Russia in FY2011.<sup>32</sup> Iran has a small stock of U.S.-origin used HEU research reactor fuel under international safeguards, but Iran is not willing to return the fuel to the United States at this time.<sup>33</sup> North Korea’s plutonium stocks are for weapons purposes, and not under international monitoring.

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<sup>29</sup> The Lugar Doctrine states, “The United States will use all of its military, diplomatic and economic power—without question—to ensure that life threatening weapons of mass destruction everywhere are accounted, contained and hopefully destroyed.” Some analysts assert this should apply to weapons-usable nuclear material as well as weapons. Press Release, December 6, 2001, <http://lugar.senate.gov/bio/doctrine.cfm>.

<sup>30</sup> [http://www.fissilematerials.org/ipfm/pages\\_us\\_en/disarmament/dispositionofpuandheu/dispositionofpuandheu.php](http://www.fissilematerials.org/ipfm/pages_us_en/disarmament/dispositionofpuandheu/dispositionofpuandheu.php).

<sup>31</sup> Summary available at <http://ftp.fas.org/irp/offdocs/nsdp/nsdp-48.html>.

<sup>32</sup> House Appropriations Subcommittee on Energy and Water Development Hearing, March 10, 2010.

<sup>33</sup> The research reactor was converted to LEU use, but approximately 7 kg of used HEU spent fuel is still housed on-site. “Civil HEU Stock Map,” Nuclear Threat Initiative website, <http://www.nti.org/db/heu/map.html>.

An additional challenge is convincing developed countries to improve nuclear security measures on their own stocks of HEU and plutonium or HEU research reactors. Other countries may also be sensitive about being transparent in their nuclear security practices, either for commercial or national security reasons. Another point of contention amongst developed nuclear technology holders is the issue of minimizing or eliminating the use of highly enriched uranium in the civilian fuel cycle. Significant progress has been made in recent years on efforts to remove material from a site or convert a facility to using LEU, rather than HEU, fuel. The G-8 countries have agreed to minimize the use of HEU “to the extent possible.” However, highly enriched uranium continues to be used in the civilian fuel cycle, for medical isotope production or research reactors, posing a risk of diversion. The Obama Administration has stopped short of calling for a ban on HEU for civilian use. Some analysts have suggested that U.S. leadership is required to get other countries to support this. Others argue that it is more important to secure international cooperation on this issue and that compromise language in the near-term is appropriate.<sup>34</sup> A group of nongovernmental representatives called the Fissile Materials Working Group on September 30, 2009, sent a letter to Administration officials urging that the Obama Administration propose a timetable for HEU phase-out in the civilian fuel cycle at the summit.<sup>35</sup>

## Domestic Nuclear Security Measures

The steps the United States takes itself may be important in convincing other countries to take action to improve their own nuclear security. The United States has been working to improve its own nuclear security in recent years. Multiple agencies are involved in the effort. The Department of Defense (DOD) is responsible for securing the U.S. nuclear weapons stockpile, while the Department of Energy (DOE) maintains security at the national laboratories and other facilities in the nuclear weapons complex. DOE is also working to convert the last of the civilian HEU-fueled research reactors in the United States, and has recovered unwanted or excess high-priority radioactive sources in the United States. DOE has completed the conversion of 17 U.S. university HEU-fueled research reactors. Two remaining HEU-fueled university research reactors at the Massachusetts Institute of Technology (MITR) and the University of Missouri (MURR) both require a new higher density LEU fuel, currently under development.<sup>36</sup>

DOE is also consolidating weapons usable material within the weapons complex to lessen security risks. In order to improve security over the stocks at U.S. sites with special nuclear material (SNM),<sup>37</sup> the NNSA has been working since October 2006 to consolidate SNM at five sites by 2012, and “significantly reduce square footage at those sites by 2017.”<sup>38</sup> The five sites are Los Alamos National Laboratory, the Nevada Test Site, the Savannah River Site, Y-12 Security

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<sup>34</sup> Russia, for example, operates HEU-fueled civilian reactors and has not agreed to a phase-out. For a full discussion of the international dimensions, see “International Politics of Civilian HEU Elimination,” Nuclear Threat Initiative website, <http://nti.org/db/heu/international.html>.

<sup>35</sup> [http://www.partnershipforglobalsecurity.org/documents/fissile\\_material\\_policy\\_recommendations\\_to\\_the\\_obama\\_administration.pdf](http://www.partnershipforglobalsecurity.org/documents/fissile_material_policy_recommendations_to_the_obama_administration.pdf).

<sup>36</sup> <http://nnsa.energy.gov/news/2615.htm>.

<sup>37</sup> “Special Nuclear Material” includes highly enriched uranium and plutonium, <http://www.nrc.gov/materials/sp-nucmaterials.html>.

<sup>38</sup> See, for example, “NNSA Ships Additional Special Nuclear Material from Lawrence Livermore National Laboratory as part of De-Inventory Project,” NNSA Press Release, September 30, 2009, <http://nnsa.energy.gov/2628.htm>.

Complex, and the Idaho National Laboratory. Work on this is ongoing. For example, Los Alamos National Laboratory has removed two-thirds of its SNM requiring the highest levels of protection.

The Nuclear Regulatory Commission (NRC) is responsible for security standards at civilian sites. After the 9/11 attacks, security measures at nuclear power plants were improved.<sup>39</sup> The Energy Policy Act of 2005 (P.L. 109-58) mandated that the NRC revise its “Design Based Threat,” which specifies the maximum severity of potential attacks that a nuclear plant’s security force must be able to repel. This Act also required for more extensive security checks for personnel at a broad range of nuclear facilities.

U.S. Customs and Border Protection, under the Department of Homeland Security (DHS), uses handheld and portal-based radiation monitors to detect nuclear materials entering the United States.<sup>40</sup> The DHS Science and Technology Directorate conducts research and development to improve radiation detection portals.<sup>41</sup>

## **Multilateral Efforts to Improve Nuclear Security**

One challenge for improving nuclear security around the world has been diverse threat perceptions and varying definitions of nuclear security. For some countries, like the United States, policy makers view the threat of nuclear terrorism as urgent, whereas other countries may see the threat as remote, with trans-shipment of nuclear materials through their territory being of greatest concern. The IAEA document, “The Physical Protection of Nuclear Material and Facilities” (IAEA INFCIRC/225), includes voluntary guidelines meant to strengthen a country’s system for nuclear material control. They provide suggested requirements for physical protection against unauthorized diversion or sabotage during use, storage, or transport. It was last amended in 1999, and discussions are underway at the IAEA on how to amend and strengthen these guidelines.

The Convention on the Physical Protection of Nuclear Material and its Amendment is now the most complete legally binding international instrument governing the physical security of nuclear materials, but its adherence is not universal. A 2005 Protocol strengthening the convention will not enter into force until two-thirds of the convention parties have adopted it, a process which could take years. The summit is likely to call for universality of the Convention and early entry into force of this Amendment.

### **The IAEA and Nuclear Security**

The IAEA is the most prominent international body that promotes nuclear security, and the summit is likely to endorse its activities and call for a strengthening of the IAEA’s role.<sup>42</sup> Over the years, IAEA member states have adopted voluntary guidelines for nuclear and radiological material security through INFCIRC/225, the Code of Conduct on the Safety and Security of

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<sup>39</sup> See CRS Report RL34331, *Nuclear Power Plant Security and Vulnerabilities*, by Mark Holt and Anthony Andrews.

<sup>40</sup> See CRS Report R40154, *Detection of Nuclear Weapons and Materials: Science, Technologies, Observations*, by Jonathan Medalia.

<sup>41</sup> See CRS Report RL34574, *The Global Nuclear Detection Architecture: Issues for Congress*, by Dana A. Shea.

<sup>42</sup> Note that while India, Israel, and Pakistan are not signatories of the Non-Proliferation Treaty, they are members of the IAEA.

Radioactive Sources, and Guidance on the Import and Export of Radioactive Sources (INFCIRC/663). The IAEA has routinely assisted countries with improving their nuclear security practices since the 1970s. IAEA safeguards (INFCIRC/153) agreements require that a country have an effective State System of Accountancy and Control (SSAC) for nuclear material.

Just as the focus on nuclear safety drastically increased following the Chernobyl accident, the IAEA's role in nuclear security activities increased following the September 11, 2001, terrorist attacks—which spurred the creation of a distinct Nuclear Security Program at the IAEA.<sup>43</sup> A Nuclear Security Plan was adopted by the IAEA General Conference for 2006-2009 and recently for the period 2010-2013. The second plan emphasizes sustainability of nuclear security practices and training. The IAEA Nuclear Security Program has developed a series of 11 guides on nuclear security topics, and provides in-country assessments and training. The International Physical Protection Advisory Service (IPPAS), for example, provides IAEA member states with confidential expert advice on how to strengthen their physical protection measures and comply with international guidelines. This could include legislation, regulations, licensing, and measures at the facility level. The Nuclear Security Program also works to recover lost radioactive source materials and tracks nuclear trafficking incidents.

The United States provides funds to the Nuclear Security Fund (NSF), an extrabudgetary voluntary fund that supports these activities. The NSF annual budget is approximately \$33 million. In 2009, a small portion of the Nuclear Security operating costs were made part of the general IAEA budget, but the majority of funds are dependent on voluntary contributions. The United States has supported increased amounts dedicated to nuclear security activities in the IAEA regular budget. Both the Bush and Obama Administrations encouraged strengthening the IAEA's nuclear security activities.

### **Informal Initiatives and Nonproliferation Assistance**

In a addition to multilateral treaties and guidelines, a number of initiatives were developed in the past decade to address a wide range of approaches with the goal of gaining broader participation. These approaches include nonproliferation assistance and training programs, joint law enforcement activities, interdiction coordination, and general sharing of best practices. These programs aim to better coordinate governmental efforts to prevent nuclear terrorism—including better coordination within a government at the interagency level and between countries. These efforts are detailed in **Appendix A**, and include the Global Initiative to Combat Nuclear Terrorism, the G-8 Global Partnership, and the Proliferation Security Initiative. The summit is likely to endorse these efforts.

The United States provides extensive aid to foreign countries to secure or remove nuclear materials. These programs, which span several agencies, are detailed in **Appendix B**. Funding for these programs is discussed in the section “Nuclear Security and the FY2011 Congressional Budget Request.” Outside analysts predict that the summit communiqué is unlikely to include announcements of new international assistance initiatives. However, it may endorse strengthening of current mechanisms such as the UN Security Council 1540 committee's role or the G-8 Global Partnership.

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<sup>43</sup> For more information see IAEA Nuclear Security website, <http://www-ns.iaea.org/security/default.htm>.

## Role of Nongovernmental Organizations and Industry

Nongovernmental organizations play a very active role in recommending ways to address the nuclear terrorism threat and in pointing out gaps in government efforts. For the most part, nongovernmental voices on this subject urge more funds and faster governmental action on nuclear material security, and have done so for the past decade or more.<sup>44</sup> Others also have published extensive analysis, particularly on the subject of eliminating HEU from the civilian fuel cycle.<sup>45</sup> A Fissile Material Working Group was formed by a coalition of nongovernmental organizations in advance of the Nuclear Security Summit to jointly recommend courses of action. This group organized a nongovernmental nuclear security summit on April 12 to discuss civil society's contribution to the nuclear security agenda.<sup>46</sup> Skeptical nongovernmental voices tend to criticize the Obama Administration's nuclear weapons policies more generally (including the START treaty and Nuclear Posture Review).<sup>47</sup> While all appear to agree that it is necessary to prevent nuclear terrorism, some would argue that more policy emphasis should be put on counter proliferation initiatives rather than international agreements.

Medical organizations in several countries have expressed interest in halting production of medical isotopes with use of HEU. In May 2008, for example, the Malaysian Medical Association unanimously passed a resolution titled "Eliminating Highly Enriched Uranium from Radiopharmaceutical Production."

Industry associations are also working to promote nuclear security. For example, the World Institute of Nuclear Security (WINS) is an industry-oriented organization that brings together nuclear plant operators to exchange best practices.<sup>48</sup> Industry representatives plan to meet following the summit on April 14 to discuss how industry can improve nuclear security.

## Considerations and Options for Congress

### Legislation in the 111<sup>th</sup> Congress

The Senate Judiciary Committee may soon consider implementing legislation for the Nuclear Terrorism Convention, CPPNM Amendment, 2005 SUA Protocols.<sup>49</sup> The Senate approved

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<sup>44</sup> *Securing the Bomb*, [http://www.nti.org/e\\_research/cnwm/overview/cnwm\\_home.asp](http://www.nti.org/e_research/cnwm/overview/cnwm_home.asp).

<sup>45</sup> See, for example, the July 2008 edition of *Nonproliferation Review* devoted to the global elimination of highly enriched uranium at <http://cns.miis.edu/npr/152toc.htm>.

<sup>46</sup> For a list of member organizations, see <http://fmwg.presstoools.org/about> The FMWG sent a letter to Obama Administration officials in September 2009 recommending Summit outcomes: <http://fmwg.presstoools.org/node/34505>.

<sup>47</sup> See, for example, remarks at the "Questioning Obama's Nuclear Agenda Conservative Counter Summit," Heritage Foundation, April 6, 2010, <http://www.heritage.org/Events/2010/04/Questioning-Obamas-Nuclear-Agenda>.

<sup>48</sup> For more information, see <http://www.wins.org/>.

<sup>49</sup> Protocol of 2005 to the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, and the Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf.

resolutions of advice and consent to ratification for these agreements in September 2008. The Obama Administration sent draft implementing legislation to the committee in late March 2010, but legislation has not yet been introduced. These international instruments will likely be endorsed by the Nuclear Security Summit communiqué.

The Nuclear Forensics and Attribution Act (P.L. 111-140), originally introduced by Representative Schiff, became law in February 2010. It expresses the sense of Congress that the President should pursue agreements to establish an international framework for nuclear forensics analysis on confiscated nuclear material and develop protocols for data exchange. It also amends the Homeland Security Act of 2002 to establish a National Technical Nuclear Forensics Center within the Domestic Nuclear Detection Office.

Senator Casey and Representative Schiff introduced the Nuclear Trafficking Prevention Act (S. 1464, H.R. 3244) in July 2009. The bill would amend the federal criminal code to prohibit the transfer of a nuclear weapon or device, or of nuclear material or sensitive nuclear technology, to any foreign terrorist organization or any other person engaged in terrorist activities. It would grant extraterritorial jurisdiction to prosecute violations and impose a fine and minimum prison term of 25 years for violations (life imprisonment for violations resulting in death). It also says the transfer of a nuclear weapon or device or of nuclear material or technology for terrorist purposes should be a crime against humanity and should be punished under customary international criminal law.

Senator Akaka introduced the Strengthening the Oversight of Nuclear Nonproliferation Act of 2009 (S. 1931). This Act would require the President's Coordinator for the Prevention of Weapons of Mass Destruction Proliferation and Terrorism to report to the appropriate congressional committees (1) annually regarding the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism's findings concerning U.S. nuclear nonproliferation efforts, and (2) regarding U.S. cooperative efforts with the International Atomic Energy Agency (IAEA) on nuclear nonproliferation. The commission made several recommendations related to preventing nuclear terrorism.

The House passed the American Medical Isotopes Production Act of 2010 (H.R. 3276) in November 2009. It was originally introduced by Representative Markey. It was reported out of the Senate Committee on Energy and Natural Resources with amendments in January 2010. The Act aims to promote the domestic (U.S.) production of molybdenum-99 for medical isotope production, and to condition and phase out the export of HEU for the production of medical isotopes. A phase-out of U.S. export of HEU for medical isotope production could strengthen U.S. calls for other countries to also eventually eliminate the use of HEU for civilian purposes.<sup>50</sup> The G-8 and UN Security Council Resolution 1887 have called for the minimization of the use of HEU for civilian purposes, in order to lessen security risks.

## **Nuclear Security and the FY2011 Congressional Budget Request**

In its annual appropriations considerations, Congress will decide on funding for the U.S. domestic and international programs focused on nuclear material security and nuclear terrorism prevention. As detailed in **Appendix B**, these programs are primarily implemented by the Departments of

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<sup>50</sup> For details, see S.Rept. 111-120.

Defense, Energy, State, and Homeland Security. The intelligence community also clearly plays a key role in analyzing nuclear terrorism threats and illicit trafficking issues.

The Obama Administration's FY2011 congressional budget request proposes overall increases in funding for nuclear security-related accounts, with the stated purpose of ramping up programs to meet the President's four-year goal. These budget increases are primarily visible in the DOE NNSA Defense Nonproliferation programs. The DOD, State Department, and DHS programs have for the most part reprogrammed money from other parts of their nonproliferation or threat-reduction funds to programs that would contribute to meeting the four-year goal.

The DOD has proposed \$74 million for a new initiative under the Cooperative Threat Reduction program to help fulfill the four-year goal. The Global Nuclear Lockdown (GNL) would include establishing regional centers of excellence for nuclear security around the world. They are meant to "assess equipment and manpower, provide material security training, and demonstrate enhanced security procedures and processes."<sup>51</sup>

In the FY2011 budget request, the State Department proposes new funding to support UN Security Council Resolution 1540, a decrease for the Non-proliferation Disarmament Fund (NDF) and increase in voluntary funds for the IAEA, which could include Nuclear Security Fund contributions.

Much of the increase for the NNSA Defense Nonproliferation budget, an increase of 26% over FY2010, reflects a \$300 million increase for the Fissile Material Disposition to build a facility to dispose of excess U.S. weapons plutonium at the Savannah River site and a shift of the pit disassembly plants construction funding to the Fissile Material Disposition program from another account.<sup>52</sup> Other funds would go toward plutonium disposition in Russia. A significant increase is also proposed for the GTRI program—the FY2011 request for this program is \$558.8 million, up from \$333.5 million appropriated for FY2010.

The House Appropriations Subcommittee on Energy and Water Development hearing on March 10, 2010, reviewed the NNSA's funding request for FY2011. While supporting the goal of securing vulnerable nuclear material in four years, the vice chairman and ranking member questioned the ability of NNSA to execute the proposed funding increase for nuclear material security programs in one year. The Senate Appropriations Subcommittee on Energy and Water Development discussed similar concerns. In response, chief operating officer for the Office of Defense Nuclear Nonproliferation, Steven Black, said that nearly all international agreements are in place to allow the work to go forward overseas with either HEU research reactor conversions or nuclear material security upgrades. He also said that the offices involved have had a 15% increase in staffing and that DOE has streamlined local contracting procedures.

While appropriators expressed initial concerns, in contrast, some outside analysts argue that the funding increases proposed are not enough to meet the four-year goal. Harvard University scholar Matthew Bunn, for example, says that "at least these amounts—and probably more—will be needed to have any hope of achieving the four-year goal."<sup>53</sup> At a Capitol Hill briefing in February

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<sup>51</sup> FY2011 Budget Estimate, Cooperative Threat Reduction Program, [http://comptroller.defense.gov/defbudget/fy2011/budget\\_justification/pdfs/01\\_Operation\\_and\\_Maintenance/O\\_M\\_VOL\\_1\\_PARTS/CTR\\_FY11.pdf](http://comptroller.defense.gov/defbudget/fy2011/budget_justification/pdfs/01_Operation_and_Maintenance/O_M_VOL_1_PARTS/CTR_FY11.pdf).

<sup>52</sup> Over \$1 billion would be allocated to the Fissile Materials Disposition Program. See CRS Report R41150, *Energy and Water Development: FY2011 Appropriations*, coordinated by Carl E. Behrens.

<sup>53</sup> "Securing nuclear stockpiles in four years—budget and policy requirements," Presentation by Matthew Bunn, (continued...)

2010, Dr. Bunn emphasized that U.S. funding for security upgrades may accomplish the task more rapidly, but since the cost would be prohibitive, a dual-track policy approach should be in place to convince countries to pay for nuclear material security upgrades and sustainability themselves. At the same time, Kenneth Luongo pointed out in the same briefing that the amount of funds dedicated to nuclear security is only a small percentage of the federal budget, although the President has said nuclear terrorism is the number one threat.<sup>54</sup> The Fissile Materials Working Group strongly endorsed what they assess is a \$320 million dollar increase in funds dedicated to nuclear security in the FY2011 budget request.<sup>55</sup> Others say that more should be spent on securing sensitive nuclear materials in the United States before expanding programs overseas.<sup>56</sup>

It should be noted that looking simply at whether budget amounts are increased or decreased may not provide a full picture of the U.S. commitment to nuclear security. As more nuclear materials are secured or removed in countries open to cooperation, programs will spend more effort on securing agreement from countries resistant to such measures. The summit may help open some of these doors, but many countries still may see sensitive materials as a technological asset or may have a more lax attitude toward the threat of material diversion. In addition, in some cases, countries will be more comfortable working with a donor country other than the United States, or with a nongovernmental organization due to sensitivities in the bilateral relationship. Others may choose to address nuclear security programs quietly with the United States or others. This will require U.S. persuasion and diplomacy, which is more difficult to budget. In addition, as cooperative threat reduction work generally shifts from capital intensive projects such as building a material storage site to sustainability and training related work, the funding necessary will likely eventually decrease while the work could still provide significant benefits.

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(...continued)

Washington, DC, February 24, 2010.

<sup>54</sup> "Funding the Objective of Securing All Vulnerable Material in Four Years," Presentation by Kenneth Luongo, Washington, DC, February 24, 2010, [http://www.partnershipforglobalsecurity.org/PDFFrameset.asp?PDF=luongo\\_funding\\_the\\_four\\_year\\_goal.pdf](http://www.partnershipforglobalsecurity.org/PDFFrameset.asp?PDF=luongo_funding_the_four_year_goal.pdf).

<sup>55</sup> Fissile Material Working Group Letter to Congress, February 3, 2010, <http://fmwg.presstools.org/sites/default/files/FMWG%20-%20FY11%20Budget%20Letter.pdf>.

<sup>56</sup> <http://thehill.com/opinion/op-ed/88667-us-must-get-its-nuclear-house-in-order-before-april-security-summit>.

## Appendix A. Multilateral Nuclear Security-Related Instruments and Initiatives

### UN Security Council Resolutions

In September 2009, President Obama chaired a UN Security Council Summit that focused on nuclear nonproliferation. The Security Council adopted Resolution 1887, which called on countries to improve their nuclear security and step up efforts to prevent nuclear trafficking.<sup>57</sup> This resolution was unanimously adopted and endorsed President Obama's goal of securing all vulnerable nuclear material within four years.

Previous efforts at the UN Security Council have also strengthened the international community's efforts to convince all countries that the threat of nuclear terrorism should be addressed in every country, whether it holds stocks of nuclear (or other WMD) material or not. Resolution 1540 was adopted in April 2004 and requires all states to "criminalize proliferation, enact strict export controls and secure all sensitive materials within their borders." UNSCR 1540 called on states to enforce effective domestic controls over WMD and WMD-related materials in production, use, storage, and transport; to maintain effective border controls; and to develop national export and trans-shipment controls over such items, all of which should help interdiction efforts. The resolution did not, however, provide any enforcement authority, nor did it specifically mention interdiction. UN Security Council Resolutions 1673 (2006) and 1810 (2008) extended the duration of the 1540 Committee. The committee is currently focused on identifying assistance projects for states in need and matching donors to improve these WMD controls. The Obama Administration has proposed an extra-budgetary contribution to the UN for a Trust Fund to implement 1540-related projects, such as training, in its FY2011 congressional budget request.

UNSCR 1540 carries the status of a mandatory legal obligation for all UN member states, as it was adopted under Chapter VII of the UN Charter. In addition, as mentioned above, the Convention's provisions calling for information sharing and cooperation establish a basis to rally international support for efforts such as the Global Initiative to Combat Nuclear Terrorism, the

#### UN Security Council Resolution 1887, September 2009

"24. *Calls upon* Member States to share best practices with a view to improved safety standards and nuclear security practices and raise standards of nuclear security to reduce the risk of nuclear terrorism, with the aim of securing all vulnerable nuclear material from such risks within four years;

25. *Calls upon* all States to manage responsibly and minimize to the greatest extent that is technically and economically feasible the use of highly enriched uranium for civilian purposes, including by working to convert research reactors and radioisotope production processes to the use of low enriched uranium fuels and targets;

26. *Calls upon* all States to improve their national capabilities to detect, deter, and disrupt illicit trafficking in nuclear materials throughout their territories, and calls upon those States in a position to do so to work to enhance international partnerships and capacity building in this regard;

27. *Urges* all States to take all appropriate national measures in accordance with their national authorities and legislation, and consistent with international law, to prevent proliferation financing and shipments, to strengthen export controls, to secure sensitive materials, and to control access to intangible transfers of technology."

<sup>57</sup> "Historic Summit of Security Council Pledges Support for Progress on Stalled Efforts to End Nuclear Proliferation," SC/9746, September 24, 2009, <http://www.un.org/News/Press/docs/2009/sc9746.doc>.

U.S.-led Global Threat Reduction Initiative, Proliferation Security Initiative (where intelligence sharing is key) and additional international nuclear security and counterproliferation efforts.

Another relevant resolution, UN Security Council Resolution 1373, adopted in September 2001, calls on states to prevent and suppress the financing of terrorism, and to deny terrorists safe haven.

## **Treaties**

A number of international treaties govern the security of nuclear material, but none are universal, and together they make up a patchwork approach to the problem to date.

### **Convention on the Physical Protection of Nuclear Material and Amendment**

The Convention on the Physical Protection of Nuclear Material, adopted in 1987, sets international standards for securing nuclear material in trade and commerce. The Convention established security requirements for the protection of nuclear materials in international transit against terrorism. Parties to the treaty also agree to report shipments to the IAEA. In 2005, the States Parties extended the scope of the Convention to include nuclear material in domestic use, storage, and transport, as well as the protection of nuclear material and facilities from sabotage.

The Amendment could potentially augment U.S. efforts to cooperate with other countries to prevent nuclear terrorism. Although the treaty itself does not have any enforcement mechanisms for compliance with its provisions, it raises standards for physical protection, defines criminal offenses, and provides a legal basis for cooperation that would bolster several existing international efforts. Criticism of the Amendment has primarily been limited to arguments that it does not go far enough to advance the nonproliferation agenda. Some analysts criticize the Amendment for not covering military stocks of nuclear materials, not including verification measures, and issuing “overly vague” guidelines for physical protection. They argue that the Amendment says only that nuclear facilities and materials should be protected, not specifically how they should be protected.<sup>58</sup>

The new rules will only come into effect once the Amendment has been ratified by two-thirds of the States Parties of the Convention, which could take several years. As of January 2010, only 34 states (out of 142 Convention parties) had ratified the amendment. On September 4, 2007, President Bush submitted the amendment to the Senate for its advice and consent on ratification. The Secretary of State’s Letter of Submittal says that once the Amendment enters into force, it will “significantly strengthen” the worldwide physical protection of nuclear material and facilities used for peaceful purposes. In the Letter of Transmittal, President Bush called it “important in the campaign against international nuclear terrorism and nuclear proliferation.”

The Senate Committee on Foreign Relations recommended that the Senate give its advice and consent on September 11, 2008. The Senate must approve implementing legislation before the

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<sup>58</sup> “International Nuclear Security Standards,” Nuclear Threat Reduction Campaign, Veterans for America, available at <http://www.veteransforamerica.org/wp-content/uploads/2008/01/25-physical-sec-y-standards.pdf>. Securing the Bomb 2007, *Nuclear Threat Initiative* website, [http://www.nti.org/e\\_research/securingthebomb07.pdf](http://www.nti.org/e_research/securingthebomb07.pdf). George Bunn, “Enforcing International Standards: Protecting Nuclear Materials From Terrorists Post-9/11,” *Arms Control Today*, January/February 2007, available at [http://www.armscontrol.org/act/2007\\_01-02/Bunn.asp](http://www.armscontrol.org/act/2007_01-02/Bunn.asp).

United States deposits its instrument of ratification to the Amendment. The Obama Administration submitted draft implementing legislation for consideration to the Judiciary Committee in late March 2010.

### ***Nuclear Terrorism Convention***

The UN General Assembly adopted the International Convention for the Suppression of Acts of Nuclear Terrorism (also known as the Nuclear Terrorism Convention or NTC) in 2005 after eight years of debating a draft treaty proposed by Russia in 1997.<sup>5</sup> Disputes over the definition of terrorism, omitted in the final version, and over the issue of nuclear weapons use by states, complicated the discussions for many years. After September 11, 2001, states revisited the draft treaty and the necessary compromises were made. The Convention entered into force in July 2007 and had 63 States Parties and 115 signatories as of January 2010. The United States has strongly supported the Convention, and President Bush was the second to sign it (after Russian President Putin) on September 14, 2005. The Senate Committee on Foreign Relations reported the treaty to the full Senate and recommended advice and consent on September 11, 2008. The Senate must approve implementing legislation before the United States deposits its instrument of ratification to the Convention. The Obama Administration submitted draft legislation was submitted to the Judiciary Committee in late March 2010.

The Convention defines offenses related to the unlawful possession and use of radioactive or nuclear material or devices, and the use or damage to nuclear facilities. The Convention commits each party to adopt measures in its national law to criminalize these offenses and make them punishable. It covers acts by individuals, not states, and does not govern the actions of armed forces during an armed conflict. The Convention also does not address “the issue of legality of the use or threat of use of nuclear weapons by States.” It also commits States Parties to exchange information and cooperate to “detect, prevent, suppress and investigate” those suspected of committing nuclear terrorism, including extraditions.

The NTC could potentially augment U.S. efforts to cooperate with other countries to combat nuclear terrorism. Although the treaty itself does not have any enforcement mechanisms for compliance with its provisions, it could provide a legal basis for cooperation and bolster several existing international efforts. The UNSCR 1540 could provide a vehicle to spur compliance with the NTC.

## **Informal International Initiatives**

### ***Global Initiative to Combat Nuclear Terrorism***

In July 2006, Russia and the United States announced the creation of the Global Initiative to Combat Nuclear Terrorism before the G-8 Summit in St. Petersburg. This initiative is non-binding, but requires agreement on a statement of principles. Thirteen nations—Australia, Canada, China, France, Germany, Italy, Japan, Kazakhstan, Morocco, Turkey, the United Kingdom, the United States, and Russia—endorsed a Statement of Principles at the Initiative’s first meeting in October 2006. The International Atomic Energy Agency (IAEA) and the European Union (EU) have observer status. As of January 2010, 76 states have agreed to the statement of principles and are Global Initiative partner nations.

U.S. officials have described the Initiative as a “flexible framework” to prevent, detect, and respond to the threat of nuclear terrorism. It is meant to enhance information sharing and build capacity worldwide. The Statement of Principles pledges to improve each nation’s ability to secure radioactive and nuclear material, prevent illicit trafficking by improving detection of such material, respond to a terrorist attack, prevent safe haven to potential nuclear terrorists and financial resources, and ensure liability for acts of nuclear terrorism. Participating states share a common goal to improve national capabilities to combat nuclear terrorism by sharing best practices through multinational exercises and expert level meetings. Without dues or a secretariat, actions under the Initiative will take legal guidance from the International Convention on the Suppression of Acts of Nuclear Terrorism, the Convention on the Physical Protection of Nuclear Materials and UN Security Council Resolutions 1540 and 1373. President Obama in an April 2009 speech said that the Global Initiative should be turned into a “durable international institution,” but how this would be implemented is not yet clear.

### *G-8 Global Partnership*

The Global Partnership Against the Spread of Weapons and Materials of Mass Destruction was announced by the Group of Eight (G-8) Nations at their 2002 summit. The G-8 members agreed to raise \$20 billion over 10 years for nonproliferation-related assistance beginning in Russia, of which the United States committed to providing \$10 billion. Since 2002, 12 countries and the European Union have joined the G-8 as donors. The Global Partnership countries have recently agreed to extend the Global Partnership to recipients worldwide on a case-by-case basis. Nuclear security and fissile material disposition programs have played a prominent role in Global Partnership programs. Some countries, including the United States, would like the Global Partnership renewed for another 10 years, and would like to see nuclear material security as a key component of future assistance. Thus, the Global Partnership could be a key means for international coordination of funding nuclear security assistance programs in the next four years.

### *Proliferation Security Initiative*

The Proliferation Security Initiative (PSI) was formed to increase international cooperation in interdicting shipments of weapons of mass destruction (WMD), their delivery systems, and related materials. The Initiative was announced by President Bush on May 31, 2003. PSI does not create a new legal framework but aims to use existing national authorities and international law to achieve its goals. Initially, 11 nations signed on to the “Statement of Interdiction Principles” that guides PSI cooperation. As of August 2009, 95 countries have committed formally to the PSI principles, although the extent of participation may vary by country. PSI has no secretariat, but an Operational Experts Group (OEG), made up of 20 PSI participants, coordinates activities.

Although WMD interdiction efforts took place with international cooperation before PSI was formed, supporters argue that PSI training exercises and boarding agreements give a structure and expectation of cooperation that will improve interdiction efforts. Many observers believe that PSI’s “strengthened political commitment of like-minded states” to cooperate on interdiction is a successful approach to counter-proliferation policy. President Obama in an April 2009 speech said that PSI, like the Global Initiative, should be turned into a “durable international institution,” but how this would be implemented is not yet clear.<sup>59</sup>

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<sup>59</sup> Remarks by President Obama, Prague, April 5, 2009.

## **Appendix B. U.S. Nuclear Security Assistance to Foreign Countries**

U.S. policy strategies have focused on material removal or conversion, consolidation, or improved protection at a site. Related assistance programs are spread through several federal agencies. Funding for these programs is discussed in the section “Nuclear Security and the FY2011 Congressional Budget Request.”

### **Department of Defense**

The first nuclear material security assistance programs were authorized through DOD’s Cooperative Threat Reduction (CTR) program in 1991 when Congress passed the Soviet Nuclear Threat Reduction Act (the Nunn-Lugar Amendment). CTR, through the Defense Threat Reduction Agency (DTRA), helps foreign governments dismantle and destroy infrastructure associated with nuclear weapons and other weapons of mass destruction, and enhances the security and safety of fissile material storage and transportation, particularly in Russia. The CTR mission also expanded to include scientist redirection programs. CTR legislation also authorized similar activities by the DOE and the State Department. The CTR program has been undergoing a transformation and is now referred to as Nunn-Lugar Global Cooperation in DOD program documents. This reflects the shift in focus from just the Russia and the former Soviet states to a more global mission, as authorized in the FY2008 Defense Authorization bill. It also reflects a shift in threat perception as the WMD terrorism threat has gained prominence. Through these programs, DOD will play a role in strengthening nuclear security with international partners. In the Obama Administration’s FY2011 budget request, the DOD has proposed \$74 million for a new initiative under the CTR program to help fulfill the four-year goal. The Global Nuclear Lockdown (GNL) would include establishing regional centers of excellence for nuclear security around the world. They are meant to “assess equipment and manpower, provide material security training, and demonstrate enhanced security procedures and processes.”<sup>60</sup>

### **Department of Energy, NNSA**

The DOE’s National Nuclear Security Administration (NNSA) is charged with nuclear nonproliferation work overseas, including nuclear materials security upgrades, removal of sensitive material or conversion of research reactors from highly enriched uranium (HEU) to low enriched uranium (LEU) fuel. The main vehicles for this assistance are the Global Threat Reduction Initiative (GTRI) and the International Materials, Protection, Control & Accounting (MPC&A) programs. The Fissile Material Disposition program works to reduce HEU and plutonium excess to military needs in the United States and Russia. Various other NNSA programs also contribute to the mission of preventing nuclear terrorism. This report highlights only a few programs related to the security or removal of weapons-usable nuclear material.

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<sup>60</sup> FY2011 Budget Estimate, Cooperative Threat Reduction Program, [http://comptroller.defense.gov/defbudget/fy2011/budget\\_justification/pdfs/01\\_Operation\\_and\\_Maintenance/O\\_M\\_VOL\\_1\\_PARTS/CTR\\_FY11.pdf](http://comptroller.defense.gov/defbudget/fy2011/budget_justification/pdfs/01_Operation_and_Maintenance/O_M_VOL_1_PARTS/CTR_FY11.pdf).

## **Security Upgrades on HEU Facilities Overseas**

The United States is working on a bilateral basis with a number of countries to improve their nuclear material security practices at research reactors. NNSA's Global Research Reactor Security (GRRS) program conducts this work. It has provided security upgrades at 18 out of 22 HEU-fueled civilian research reactors in the GRRS program worldwide. There are an estimated 165 research reactors globally that continue to use HEU fuel. NNSA plans to complete physical security upgrades at the remaining reactors by 2010. It is working with the IAEA to ensure sustainability of the security upgrades. A September 2009 GAO report examined security upgrades under this program and found that most foreign research reactors that have received upgrades meet international standards. However, GAO visited 5 of the 22 sites and found security weaknesses. In addition, because GRRS is a voluntary program, not all foreign governments move quickly to implement or sustain the security upgrades. The summit will likely highlight the importance of sustainability of security upgrades at nuclear sites.

## **Research Reactor Conversion**

The Global Threat Reduction Initiative program within the National Nuclear Security Administration is charged with HEU return and conversion at home and abroad and aims to convert 129 HEU-fueled research reactors by 2018. According to an NNSA press release, NNSA has now converted or verified the shutdown of 67 HEU-fueled research reactors of the 129 targeted by the GTRI program. This would mean that 62 are left to convert. The remaining research reactors are either used for defense programs or cannot be converted with current technology.

## **Nuclear Material Disposition**

The NNSA's Office of Fissile Material Disposition (NA-26) manages HEU disposition programs. According to the NNSA, it has monitored the down blending into nuclear fuel of more than 375 metric tons of Russian HEU, out of the agreed 500 MT by 2013. This provides 10% of U.S. electricity.<sup>61</sup> NNSA has also converted 11.4 MT of Russian excess non-weapons program HEU into LEU.

Two hundred seventeen MT of excess U.S. HEU is to be downblended by various means. So far, NNSA has downblended or delivered for downblending into nuclear reactor fuel more than 124 MT of surplus U.S. HEU. An additional 17.4 MT of HEU is being downblended for the Reliable Fuel Supply Initiative. Much of an approximately 56 MT of the 217 MT total excess HEU is not yet available for disposition due to weapons dismantlement schedules. Another portion, approximately 18 MT, are discard materials and will likely be stored at waste facilities.<sup>62</sup>

## **Second Line of Defense (SLD) program**

The SLD program, through international agreements, helps foreign countries establish detection capabilities for nuclear materials. Detection equipment is placed at ports of entry, border

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<sup>61</sup> <http://nnsa.energy.gov/news/2592.htm>.

<sup>62</sup> Steve Sanders and Dean Tousley, "The U.S. Highly Enriched Uranium Disposition Program," paper presented to the Institute of Nuclear Materials Management Annual Meeting, July 2009, Tucson, AZ.

crossings, and other designated locations to detect illicit transport of nuclear materials at international borders. DOE has expanded the SLD effort through the Megaports Initiative, which deploys radiation detection equipment to increase detection of nuclear materials at ports of departure rather than at ports of entry.

## **Department of State**

The State Department has a primarily facilitating and coordinating role in nuclear security and nuclear terrorism prevention efforts. The International Security and Nonproliferation (ISN) bureau manages the assistance programs that aim to help foreign governments and international organizations prevent weapons of mass destruction proliferation or terrorism. ISN does this through a variety of initiatives aimed at “denying access to WMD and related materials, expertise, and technologies” by boosting material and facility security, improving export and border controls and strengthening inter-governmental coordination. This assistance is funded primarily through the Non-proliferation, Anti-terrorism, Demining Programs account (NADR).<sup>63</sup> ISN’s Export Control and Related Border Security (EXBS), Nonproliferation Disarmament Fund (NDF), and Global Threat Reduction programs are the most prominent nuclear security-related assistance programs. The NADR account also includes voluntary contributions to the International Atomic Energy Agency (IAEA).

The State Department’s International Security and Nonproliferation (ISN) Bureau coordinates diplomatic meetings and policy development for the Global Initiative to Combat Nuclear Terrorism, the Proliferation Security Initiative (PSI), and the G-8 Global Partnership. The Export Control and Related Border Security Assistance (EXBS) program helps the former Soviet states and other nations improve their ability to interdict nuclear smuggling and their ability to stop the illicit trafficking of all materials for weapons of mass destruction, along with dual-use goods and technologies. The EXBS program currently has projects under way in more than 30 nations.

Since gaining agreement to secure sensitive material or improve export controls are often politically sensitive and directly related to the overall bilateral relationship with a country, the State Department also plays a key role in setting up agreements with foreign countries that may be implemented by other agencies. The State Department also has notwithstanding authority through its Nonproliferation and Disarmament Fund to work in countries where nuclear material or technologies need to be removed from a site on an emergency basis.

## **Department of Homeland Security**

Two overarching DHS initiatives, the Container Security Initiative and the Secure Freight Initiative, work to increase the likelihood that nuclear material or a nuclear weapon would be identified and interdicted during shipping. The Domestic Nuclear Detection Office also has responsibilities to coordinate federal agencies activities on setting up a global nuclear detection system.<sup>64</sup>

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<sup>63</sup> Assessed contributions to the International Atomic Energy Agency and the Organization for the Prohibition of Chemical Weapons are from the International Organizations account.

<sup>64</sup> For greater detail, see CRS Report R40154, *Detection of Nuclear Weapons and Materials: Science, Technologies, Observations*, by Jonathan Medalia and CRS Report RL34574, *The Global Nuclear Detection Architecture: Issues for Congress*, by Dana A. Shea.

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