

Nuclear Security Factsheet



A briefing by BASIC

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What is Nuclear Security?

An initiative to upgrade security measures, including physical protection, material control and accounting, at nuclear material sites around the world to prevent loss or theft of such material.¹

Why is Nuclear Security Important?

World leaders have identified the illicit transfer or proliferation of fissile material as a global threat. Known terrorist groups, such as Al-Qaeda, have expressed interest in acquiring the materials and the know-how to build nuclear weapons and use them. Though there are many substantial challenges in the path of any group seeking to acquire and use a nuclear weapon, some analysts believe that with the widespread existence of fissile material around the world – 2000 tons dispersed throughout 25 countries – it is only a matter of time before they succeed.² In light of this seeming threat, nuclear security initiatives can reduce proliferation risks posed by both, state and non-state actors.

Nuclear Security Goals

- To prevent the illegal possession, use or transfer of nuclear or radioactive material, technology and expertise.³
- To secure, or remove and eliminate, stocks of fissile material.⁴
- To eliminate or reduce the risk of insider threat.⁵
- To minimize the use of highly enriched uranium (HEU) in civilian applications.
- To establish “security by design.” This term refers to strengthening the infrastructure of nuclear facilities and implementing interior segregation designs in order to make facilities better able to withstand an outside attack and to minimize personnel access to fissile material.⁶

Glossary

Weapons-usable or fissile material
Material that can cause a nuclear explosion including highly enriched uranium (HEU) and separated plutonium.

Nuclear terrorism
The usage of nuclear weapons or dirty bombs against civilian populations. It might also entail conducting attacks on nuclear power plants.

Dirty bombs
Conventional explosives packaged in radioactive materials.

Significant Incidents

- 2013 A truck carrying a 3000-curie source of radioactive material was stolen in Mexico.⁷
- 2012 An 82-year old nun and two companions broke into the HEU storage facility at the Y-12 National Security Complex in Oak Ridge, Tennessee.⁸
- 2010 Two Armenians were caught in Georgia after attempting to sell 18 grams of HEU.⁹
- 2007 Armed men evaded a 10,000-volt security fence and intrusion detectors as they broke into the Pelindaba nuclear facility in South Africa. They spent 45 minutes within the facility’s perimeter without being spotted by security guards.¹⁰

¹Nuclear Security 101." *National Nuclear Security Administration*. 23 Mar 2012 <<http://nnsa.energy.gov/mediaroom/factsheets/nucsec101>>.

²*Nuclear Materials Security Index*. 2nd edition. Nuclear Threat Initiative, 2014. Pg. 3.

³Nuclear Security 101." *National Nuclear Security Administration*. 23 Mar 2012 <<http://nnsa.energy.gov/mediaroom/factsheets/nucsec101>>.

⁴*Ibid*

⁵Security by Design Fact Sheet ." *National Nuclear Security Administration*. 23 Mar 2012. <<http://nnsa.energy.gov/mediaroom/factsheets/securitybydesign>>.

⁶*Ibid*

⁷ Tom Bielefeld, “Mexico’s Stolen Radiation Source: It Could Happen Here.” *Bulletin of the Atomic Scientists*, January 2014

<http://thebulletin.org/mexico%E2%80%99s-stolen-radiation-source-it-could-happen-here>

⁸*Nuclear Materials Security Index*. 2nd edition. Nuclear Threat Initiative, 2014.

⁹ Borger, Julian. “Nuclear bomb material found for sale on Georgia black market.” *The Guardian*. Nov. 7, 2010.

<http://www.theguardian.com/world/2010/nov/07/nuclear-material-black-market-georgia>

¹⁰ Michael Wines, “Break-In at Nuclear Site Baffles South Africa.” *New York Times*. 15 Nov. 2007

http://www.nytimes.com/2007/11/15/world/africa/15joburg.html?_r=0

- 2006 Russian citizen, Oleg Khinsagov, was caught in Georgia carrying 100 grams of HEU. Khinsagov was bound to sell the material for \$1 million.¹¹
- 2001 Russian authorities reported 2 incidents in which non-state actors breached their security systems to locate and conduct surveillance on Russian nuclear weapons sites.¹²
- 1998 The Russian Federal Security Service (FSB) thwarted a planned insider theft operation, which had “quite sufficient material to produce an atomic bomb.”¹³
- 1995 Chechen separatists placed a dynamite-caesium-137 dirty bomb in Moscow’s Ismailovsky Park. They opted to alert a national television station of its location, rather than to detonate it.¹⁴

Aum Shinrikyo, a group founded by Shoko Asahara in 1987, carried a chemical attack using sarin nerve agent in the Tokyo subway. The group, undetected by US intelligence agencies, managed to produce VX, phosgene, sodium cyanide and biological weapons, including anthrax and botulism, and showed interest in developing a nuclear arsenal.¹⁵

- 1994 Czech police recovered over 8 pounds of HEU from the backseat of a parked car.¹⁶
- 1993 Russian Navy captain Alexei Tikhmirov intended to sell 10 pounds of stolen HEU at \$50,000.¹⁷
- 1992 Osama bin Laden attempted to obtain HEU from South Africa.¹⁸

¹¹ Lawrence Scott Sheets and William J. Broad. “Smuggler’s Plot Highlights Fear Over Uranium.” *New York Times*. 25 Jan. 2007 http://www.nytimes.com/2007/01/25/world/europe/25nuke.html?pagewanted=all&_r=0

¹² Bogdanov, Vladimir. “A Pass to Warheads Found on a Terrorist,” *Rossiiskaya Gazeta*, 1 Nov. 2002

¹³ Allison, Graham. *Nuclear Terrorism: The Ultimate Preventable Catastrophe*. First. New York: Henry Holt and Company, LLC, 2004. Pg. 72. Print.

¹⁴ Saradzhyan, Simon. “Russia: Grasping Reality of Nuclear Terror,” *Kennedy School of Government*. March 2003. <http://belfercenter.hks.harvard.edu/files/russia-grasping-reality-nuclear-terror-eng.pdf>

¹⁵ Allison, Graham. *Nuclear Terrorism: The Ultimate Preventable Catastrophe*. First. New York: Henry Holt and Company, LLC, 2004. 40-42.

¹⁶ *Ibid* pg. 72.

¹⁷ Oleg Bukharin and William Potter, “Potatoes Were Guarded Better,” *Bulletin of American Scientists* (May-June 1995).

¹⁸ Jeffrey Kluger, “Osama’s Nuclear Quest: How Long Will It Take Before Al-Qaeda Gets Hold of the Most Dangerous of Weapons?” *Time*, 12 Nov. 2001

Yuri Smirnov stole 3 pounds of HEU from the Luch Scientific Production plant and attempted to sell it to a buyer in Moscow.¹⁹

- 1972 Three Americans threatened to crash Southern Airways Flight 49 onto a nuclear reactor unless ransom was paid.²⁰

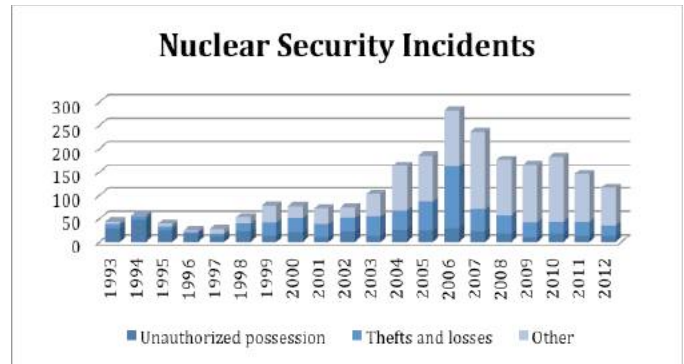


Figure 1. Nuclear Security Incidents reported by the Incident and Tracking database (ITDB). 120 participating states and some non-participating states have reported a total of 2,331 incidents to the ITDB. “Unauthorized possession” describes incidents of illegal possession, and attempts to trade in or use nuclear material or radioactive sources. Unauthorized activities include the unauthorized disposal of radioactive materials or discovery of uncontrolled sources.²¹ *Of these 2,331 incidents, there have been at least 18 documented cases of theft or loss of highly enriched uranium or plutonium.*²²

Nuclear Security Techniques/Methods

- Deploying radiation detection systems at key border crossings, airports and seaports, and providing training and sustainability support, at high-risk land, sea and air border crossings to be able to detect and seize stolen nuclear material.²³
- Disposing of excess nuclear and radiological materials.²⁴
- Converting research and commercial reactors from the use of HEU to low enriched uranium (LEU).²⁵
- Downblending HEU to LEU.²⁶
- Improving accounting systems to eliminate inventory uncertainties.

¹⁹ Allison, Graham. *Nuclear Terrorism: The Ultimate Preventable Catastrophe*. First. New York: Henry Holt and Company, LLC, 2004. 64-65.

²⁰ *Ibid*

²¹ “Incident and Trafficking Database (ITDB).” *International Atomic Energy Agency*. 20 Aug 2013. <<http://www-ns.iaea.org/security/itdb.asp>>.

²² “Key Facts on the 2012 Seoul Nuclear Security Summit.” *U.S. State Department*. 28 Mar 2012. <<http://www.state.gov/t/isn/rls/fs/187208.htm>>.

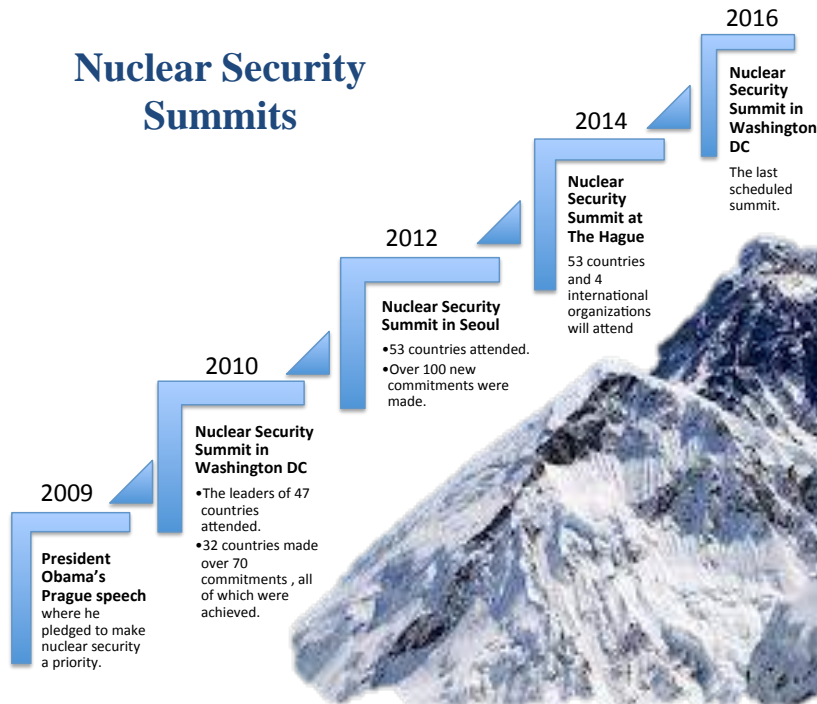
²³ “About NNSA.” *National Nuclear Security Administration*. 2 Mar 2010 <<http://nnsa.energy.gov/mediaroom/factsheets/aboutnnsa>>.

²⁴ *Ibid*

²⁵ *Nuclear Materials Security Index*. 2nd edition. Nuclear Threat Initiative, 2014. pg. 12.

²⁶ *Ibid*

Nuclear Security Summits



Main Accomplishments

- Since 1992, 26 countries and Taiwan have eliminated all or most of their fissile materials.²⁷
- Two Nuclear Security Summits have been convened (Washington DC, 2010 and Seoul, 2012). Two more are scheduled (The Hague, 2014 and Washington DC, 2016).
- The UN Security Council passed resolutions 1540 and 1887 in 2004 and 2009, respectively calling on all states to boost nuclear security standards.²⁸
- The National Nuclear Security Agency, NNSA, established the Global Threat Reduction Initiative (GTRI) in 2004. GTRI has removed 5,050 kilograms of HEU from 27 countries, enough for more than 200 nuclear weapons.²⁹ It also supported the first successful large-scale production of medical isotope molybdenum-99 (Mo-99) using LEU targets.³⁰

Remaining Challenges

- Lack of a governing institution with the mandate and resources to provide common international standards, and verification or punitive mechanisms to hold states accountable.³¹
- Not enough states, including the United States, have become parties to the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM), so it is not in effect.³² The amendment expands the convention's scope to include material in use, in storage, and in domestic as well as international transit.³³
- All international efforts in the nuclear security context—IAEA safeguards, the nuclear security summits and the guidelines of the CPPNM and its 2005 Amendment—deal with fissile materials used in civilian programs. This represents only 15% of all fissile material with the remaining 85% pertaining to military programs.³⁴

²⁷Nuclear Materials Security Index. 2nd edition. Nuclear Threat Initiative, 2014. Pg. 12.

²⁸ Bunn, Mathew, et. al. "Advancing Nuclear Security: Evaluating Progress and Setting New Goals." *Harvard Kennedy School: Belfer Center*. (2014), pg. 54 <<http://belfercenter.ksg.harvard.edu/files/advancingnuclearsecurity.pdf>>.

²⁹Ibid

³⁰"GTRI's Convert Program: Minimizing the Use of Highly Enriched Uranium." *National Nuclear Security Administration*. 12 Apr 2013 <<http://nnsa.energy.gov/mediaroom/factsheets/gtri-convert>>.

³¹Nuclear Materials Security Index. 2nd edition. Nuclear Threat Initiative, 2014. Pg. 7.

³²Ibid

³³Ibid Pg. 8.

³⁴Ibid pg. 10.