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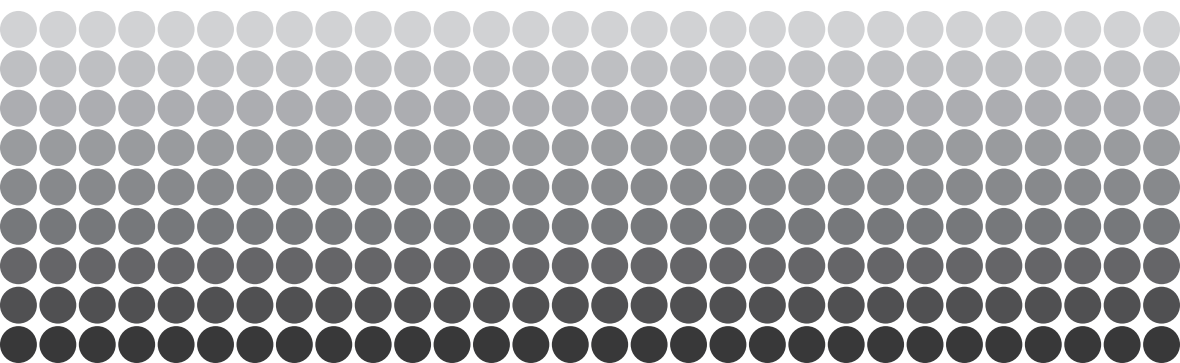
SIPRI YEARBOOK 2013

Armaments, Disarmament and International Security

Measures to combat nuclear terrorism

IAN ANTHONY



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This is an offprint of section IV of chapter 7 of

SIPRI Yearbook 2013: Armaments, Disarmament and International Security
Oxford University Press, 2013, ISBN 978–0–19–967843–3, hardback, xxii+574 pp., £100/$185

The SIPRI Yearbook is published and distributed in print and online by Oxford University Press—more information is available at <http://www.sipriyearbook.org>

OXFORD
UNIVERSITY PRESS

www.sipriyearbook.org

IV. Measures to combat nuclear terrorism

IAN ANTHONY

On 26–27 March 2012, 53 heads of state and government, as well as representatives of the United Nations, the European Union (EU), the International Atomic Energy Agency (IAEA) and Interpol, took part in a Nuclear Security Summit in Seoul, South Korea.[1] The meeting was the follow-up to the Nuclear Security Summit, convened in Washington, DC, in 2010, in which 47 states and 3 international organizations took part.

Concerns about the possible malicious use of radioactive material have existed since the beginning of the nuclear age, and international standards for nuclear security have been developed from the 1960s onwards.[2] However, the mass impact of the terrorist attacks on the United States of 11 September 2001 provided a catalyst for a significant increase in international attention to the risks of terrorism, including nuclear terrorism. This interest has been reflected in changes to what is called the 'global nuclear security architecture' in the Seoul Summit communiqué.[3]

This section first reviews the current understanding of what nuclear security and nuclear terrorism are. It then summarizes the significant issues discussed at the Seoul Summit—in particular protection of nuclear materials and related facilities, and prevention of trafficking—and the priority issues identified for the next Nuclear Security Summit, to be held in the Netherlands in 2014.

Defining nuclear security and nuclear terrorism

The International Atomic Energy Agency (IAEA) defines nuclear security as 'the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities'.[4] This definition addresses a broader set of concerns than nuclear terrorism, covering other malicious acts such as criminality, acts by psychologically disturbed individuals and acts carried out for political purposes that are not considered to be terrorism—such as opposition to the use of

[1] Nuclear Security Summit Seoul 2012, '2012 Nuclear Security Summit: key facts', <http://www.thenuclearsecuritysummit.org/userfiles/Key Facts on the 2012 Seoul Nuclear Security Summit.pdf>.

[2] Concern about the military use of a bomb containing radioactive material was already present in the 1940s. Ziegler, C. A. and Jacobson, D., *Spying without Spies: Origins of America's Secret Nuclear Surveillance System* (Praeger: Westport, CT, 1995), p. 3.

[3] Nuclear Security Summit Seoul 2012, 'Seoul Communiqué', 27 Mar. 2012, <http://www.thenuclearsecuritysummit.org/userfiles/Seoul Communique_FINAL.pdf>.

[4] IAEA, 'Concepts and terms: meaning of (nuclear) security', 29 May 2012, <http://www-ns.iaea.org/standards/concepts-terms.asp?s=11&l=90>.

nuclear technology to generate electricity. However, while recognizing the need to strengthen all aspects of nuclear security, the Seoul Summit principally focused on the risk of nuclear terrorism.

In 2005, states agreed the text of an amendment to the 1980 Convention on the Physical Protection of Nuclear Material (CPPNM).[5] The CPPNM applies to nuclear material, which is defined in the convention and essentially limited to fissile material (certain isotopes of plutonium, uranium-233 and uranium enriched in the isotopes uranium-235 or -233). The amended convention—which will be renamed the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities when it enters into force—does not mention terrorism, but obliges states to apply physical protection measures to materials and facilities on their own territory, supplementing the measures in the 1980 convention for materials in international transport. When implementing the amended convention, states must criminalize certain acts and ensure that the criminal offences attract the appropriate punishments if proven. The amended CPPNM also recognizes the importance of international cooperation to prevent, detect, respond to and punish malicious acts.

The 2005 International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) defined nuclear terrorism in terms of the offences of possession of radioactive material or using radioactive material or a radioactive device, or causing damage to a nuclear facility '(i) With the intent to cause death or serious bodily injury; or (ii) With the intent to cause substantial damage to property or to the environment'.[6] The convention also created offences of conspiracy and aiding and abetting such actions.

The definition of nuclear terrorism in ICSANT is not restricted to the use of fissile material, but covers a wide spectrum of potential malicious acts, including the use of a nuclear explosive or a radioactive 'dirty bomb', the sabotage of a nuclear facility or the use of radioactive material as a poison. However, it differentiates terrorism from, for example, political protests that breach nuclear security but are not intended to injure people or destroy property.

The Seoul Summit

Preparations for the Nuclear Security Summit were affected by the major nuclear incident in Japan that began on 11 March 2011, when an undersea earthquake caused a 15-metre high tidal wave. Together, these events

[5] For a summary and other details of the CPPNM see annex A in this volume.

[6] International Convention for the Suppression of Acts of Nuclear Terrorism, adopted 13 Apr. 2005 by UN General Assembly Resolution 59/290, opened for signature 14 Sep. 2005, entered into force 7 July 2007, *United Nations Treaty Series*, vol. 2445 (2007), Article 2.

destroyed critical safety equipment at the Daiichi nuclear power plant in Fukushima, as well as devastating the surrounding area—hindering emergency response. In the first three days of the incident, the cores of three reactors melted down almost completely after electrical power was lost and cooling systems stopped functioning. While the event was natural, it underlined the need to reduce any risk that a deliberate malicious act might lead to sequential failures in the safety systems at a power plant.

At the Seoul Summit, implementation of the voluntary commitments in the Work Plan agreed at the Washington Summit was reviewed on the basis of a document prepared in advance of the meeting itemizing progress.[7] The Seoul Summit also endorsed the findings of the IAEA Nuclear Safety Group on the interface between nuclear safety and nuclear security.[8] The IAEA report recommended a series of measures to promote coordination between safety and security at nuclear installations, including activities such as exercises and seminars; the development of consistent and complementary security guides and safety standards; and combined assistance programmes, as well as review and training missions.

In addition, three issues were highlighted for particular discussion: cooperative measures to combat the threat of nuclear terrorism; the protection of nuclear materials and related facilities; and the prevention of trafficking of nuclear materials.

The protection of nuclear materials and related facilities

The protection of nuclear materials has two dimensions. First, such protection prevents the unauthorized removal of nuclear material (either by theft or diversion). This has been seen historically as an instrument for reducing the risk of proliferation. Second, protection of nuclear materials aims to reduce the risk of sabotage of either nuclear material or a nuclear facility and thereby reduce the risk that a malicious act will create a radiological hazard.

A physical protection system is intended to delay access to vital areas for long enough to allow the appropriate response forces to respond and foil the malevolent action. In developing such a system there are some responsibilities that fall on the state, in particular identifying threats and informing the nuclear facility's operators of what kinds of scenario they need to be prepared for as well as making appropriate response forces available. Some responsibilities fall on the operator, such as identifying the

[7] Seoul Nuclear Security Summit Preparatory Secretariat, 'Highlights of achievements and commitments by participating states as stated in national progress reports and national statements', 26 Mar. 2012, <http://www.thenuclearsecuritysummit.org/userfiles/Highlights of the Seoul Nuclear Security Summit(120403).pdf>; and Nuclear Security Summit Washington 2010, 'Work plan', 13 Apr. 2010, <http://www.thenuclearsecuritysummit.org/eng_common/images/fla/12.Work Plan.pdf>.

[8] IAEA, *The Interface Between Safety and Security at Nuclear Power Plants*, Report of the International Nuclear Safety Group (INSAG), INSAG-24 (IAEA, Vienna, 2010).

vital areas for protection and ensuring that necessary personnel, routines and equipment are in place.

In 2011 the IAEA published new recommendations on physical protection as part of its Nuclear Security Series.[9] The recommendations introduced an important change in the categorization of material to be protected. In the past, nuclear material with high radiation levels has been regarded as 'self-protecting' because proximity would seriously injure or kill the handler. The 2011 document recommends applying equal levels of protection to highly radioactive material if the national threat assessment suggests that an adversary is willing to perform a malicious act even if the consequences are fatal.[10] Extremists may be willing to die in order to commit an act of mass impact terrorism, but applying the recommendations could have serious financial and technical implications for countries with large volumes of material currently considered self-protecting. The participants at the Seoul Summit agreed to 'strive to use' the recommendations in their national systems for physical protection but stopped short of making a firm commitment to do so.[11]

The final communiqué of the Seoul Summit urges states in a position to do so to accelerate the process of signing and ratifying the 2005 amendment to the CPPNM, with a view to bringing the amendment into force by 2014. The communiqué encourages states to make use of IAEA activities, such as the International Nuclear Security Advisory Service (INSServ) and the International Physical Protection Advisory Service (IPPAS), to support national efforts to establish and enhance nuclear security.[12] The communiqué also draws attention to the need to use the most modern technical tools in tracking shipments of nuclear materials during transport in order to warn of loss and aid rapid recovery. Five countries—France, Japan, South Korea, the United Kingdom and the United States—promised to take forward a programme of practical activities to promote tighter security in the transport of nuclear and radioactive materials after the Summit.[13]

Preventing trafficking

To help prevent trafficking in nuclear material, the summit focused on what was called 'action-oriented coordination among national capacities' in ways that are consistent with national laws and regulations.[14]

[9] IAEA, *Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities*, INFCIRC/225/Revision 5, IAEA Nuclear Security Series no. 13 (IAEA: Vienna, 2011).

[10] IAEA, INFCIRC/225/Revision 5 (note 9), pp. 19, 21.

[11] Nuclear Security Summit Seoul 2012 (note 3), p. 2.

[12] Nuclear Security Summit Seoul 2012 (note 3), pp. 2, 3.

[13] France, Japan, South Korea, the United Kingdom and the United States, 'Joint Statement on Transport Security', Nuclear Security Summit Seoul 2012, 27 Mar. 2012, <http://www.thenuclearsecuritysummit.org/eng_media/speeches/speeches_list.jsp>.

[14] Nuclear Security Summit Seoul 2012 (note 3), p. 4.

Enhancing the technical capabilities for radiation detection and portal monitoring, either at the perimeter of a facility or a border-crossing point, has been a priority project in US external assistance since the early 1990s. Through its core programme and the Megaports Initiative, by 2018 the National Nuclear Security Administration in the US Department of Energy will have equipped around 650 sites in roughly 30 countries and more than 100 seaports with radiation detection equipment.[15] The EU has implemented broadly similar projects in 14 countries and is currently expanding its projects to new partner countries in the Middle East and South East Asia.[16]

The participants at the Seoul Summit encouraged wider participation in the IAEA Illicit Trafficking Database programme and to provide necessary information relating to nuclear and other radioactive materials outside of regulatory control.[17] Information on individuals involved in nuclear trafficking is shared, for example, via the Radiological and Nuclear Terrorism Prevention Unit at Interpol.

Identified priority issues for the 2014 Nuclear Security Summit

At the end of the meeting in Seoul, the decision was taken to organize a third Nuclear Security Summit, in 2014, to be hosted by the Netherlands. This summit will address the following issues, among others.

The role of industry in promoting nuclear security

Effective nuclear security is inevitably a partnership between state authorities and industry. State authorities play a key role in prevention by identifying threats, and responding to and recovering from an incident. However, operators must put physical protection and other measures in place at facilities, and they are almost certainly the first to detect an incident and determine its initial scale and the appropriate response.

The Seoul Summit included a side-event at which industry was encouraged to provide its views and positions on legal and technical issues as well as approaches to industry self-governance. Participants were encouraged to present practical measures being implemented and to identify practices and methods that could help improve security at an affordable cost.[18]

[15] US National Nuclear Security Administration (NNSA), 'NNSA's Second Line of Defense program', Fact sheet, 1 Feb. 2011, <https://nnsa.energy.gov/mediaroom/factsheets/nnsassecondlineofdefenseprogram>.

[16] Abousahl, S. et al., 'Integration of nuclear safeguards and security at the JRC', Paper delivered to the IAEA Safeguards Symposium, Vienna, 1–5 Nov. 2010, no. IAEA-CN-184/225, <http://www.iaea.org/OurWork/SV/Safeguards/Symposium/2010/Documents/Papers.htm>.

[17] Nuclear Security Summit Seoul 2012 (note 3), p. 5.

[18] On the 2012 Seoul Nuclear Industry Summit, 23–24 Mar. 2012, see <http://www.seoulnis.org/>.

At both the Seoul and Washington summits, it was difficult to facilitate a dialogue between political leaders and senior representatives of industry because in each case the summit and the industry side event took place in conjunction. One priority for the 2014 summit will be to find a method to facilitate a dialogue between the government and non-government representatives.

Information security

One issue that was introduced to the discussion at the Seoul Summit was the need to protect sensitive information from unauthorized access. Sensitive information in this context refers to information that reveals vulnerabilities that could be exploited by malicious actors. This might include information about how a nuclear plant is designed and operated, information about the type, quantity, location and containment of nuclear materials at a given facility, or information that could help to organize theft or sabotage—such as access control information or personnel records.

An increasing amount of sensitive information is stored electronically. One important aspect of the discussion of information security was therefore how to enhance cybersecurity. Thirty-one of the countries participating in the Seoul Summit agreed on a statement on information security and decided to keep working on this new topic with a view to bringing specific ideas and proposals to the meeting in 2014.[19]

Sustainability of nuclear security cooperation

Many observers believe that the 2014 Nuclear Security Summit could be the last for the time being. In the Netherlands, participants will discuss how to sustain and measure progress in strengthening nuclear security without biennial summits.

While the IAEA already works extensively on nuclear security issues, one issue that will be discussed in 2014 is the level of priority given to the issue within the overall range of activities being undertaken by the agency. The IAEA senior management has emphasized that, although nuclear security is now regarded as a core activity, implementing agreed nuclear security activities remains 'extensively reliant on uncertain extrabudgetary contributions'.[20] However, the proposal to fund nuclear security activities from the core budget of the IAEA has been, and remains, controversial among the membership.

In October 2012 the Russian Government announced that the legislation governing some cooperative threat reduction (CTR) projects with the USA

[19] 'Multinational statement on nuclear information security', Nuclear Security Summit Seoul 2012, Mar. 2012, <http://www.thenuclearsecuritysummit.org/userfiles/Nuclear Information Security.pdf>.

[20] IAEA, *The Agency Programme and Budget 2012–2013*, GC(55)/5 (IAEA: Vienna, Aug. 2011), p. 3.

would not be renewed on expiry in 2013.[21] The 1992 Russia–US CTR Umbrella Agreement had a 7-year lifespan.[22] Subsequent protocols to the original agreement extended its lifetime; the most recent (from 2006) is due to expire in June 2013.[23] The agreement provides the umbrella under which projects managed by the US Department of Defense are implemented in Russia and other countries of the former Soviet Union. The objectives of these projects include consolidating and securing the materials and technologies associated with nuclear weapons, and promoting defence and military cooperation to prevent the proliferation of nuclear weapons.

When announcing the decision, the Russian Ministry of Foreign Affairs underlined that Russia wants to change the basis for bilateral cooperation, not end it. The decision not to renew the CTR Umbrella Agreement when it expires could preclude certain projects, but there are other frameworks for bilateral cooperation on strengthening nuclear security, and Russia and the USA also cooperate in international forums in which both are members.[24]

The main contribution of the nuclear security summits has been to focus high-level political attention on the need to implement programmes and projects that have been in development for many years. While the high-level meetings increased the probability that agreed targets would be met prior to the gathering of heads of state and government, future summits may bring diminishing returns as the focus of discussions moves from agreement on broad objectives to more technical issues and specific projects.

[21] Russian Ministry of Foreign Affairs, 'Comment of the Information and Press Department of the MFA of Russia on the question on term of "Nunn–Lugar Cooperative Threat Reduction"', 10 Oct. 2012, <http://www.mid.ru/brp_4.nsf/0/1AA31F580B2ECD5E44257ADF0033E79D>; and Guarino, D. P., 'Obama team insists security effort with Russia not dead', Global Security Newswire, 12 Oct. 2012, <http://www.nti.org/gsn/article/obama-team-insists-security-effort-russia-not-dead/>.

[22] Agreement between the Russian Federation and the United States of America concerning the Safe and Secure Transportation, Storage, and Destruction of Weapons and the Prevention of Weapons Proliferation (CTR Umbrella Agreement), signed 17 June 1992 at Washington, DC.

[23] Kile, S. N., 'Nuclear arms control and non-proliferation', *SIPRI Yearbook 2007*, pp. 504–505.

[24] Guarino, D. P., 'White House official: Russian concerns with CTR Agreement are "valid"', Global Security Newswire, 6 Nov. 2012, <http://www.nti.org/gsn/article/white-house-aid-russian-concerns-ctr-agreement-are-valid/>.