



NUCLEAR SECURITY SUMMIT 2014

NATIONAL PROGRESS REPORT

CANADA

(MARCH 2014)

1. SUPPORT FOR INTERNATIONAL LEGAL INSTRUMENTS

CPPNM/A AND ICSANT

Canada supports a strong multilateral framework for the global fight against nuclear terrorism. The coming into force of the 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM/A) and universal implementation of the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT) would significantly augment existing global counter-terrorism efforts.

For this reason, Canada introduced legislation, known as Bill S-9, the Nuclear Terrorism Act (the Act), in the Senate on March 27, 2012. The Act received Royal Assent on June 19, 2013 and entered into force on November 1, 2013. The entry-into-force of the Act enabled Canada to ratify both the CPPNM/A Amendment and ICSANT by amending the Criminal Code to create a number of new offences related to nuclear terrorism, including:

- Making a device or possessing or trafficking nuclear or radioactive material or a device, or committing an act against a nuclear facility or its operations with the intent to cause death, serious bodily harm or substantial damage to property or the environment;
- Using or altering nuclear or radioactive material or a device, or committing an act against a nuclear facility or its operation with the intent to compel a person, a government or a domestic or international organization to do, or refrain from doing anything;
- Committing an indictable offence for the purpose of obtaining nuclear or radioactive material or a device, or to obtain access to a nuclear facility; and,
- Threatening to commit these offences.

Although the CPPNM/A has not yet entered into force, Canadian legislation, regulations and policies have been developed in accordance with the Convention's amended requirements. Furthermore, Canada informed the depository of our legislation and regulations which give effect to the Convention, including its Amendment, in accordance with article 14.1 of the CPPNM.

The instrument of ratification for ICSANT was provided to the UN Secretary-General on 21 November 2013 and Canada's Minister of State (Foreign Affairs and Consular) deposited the instrument of ratification for CPPNM/A with the IAEA on 3 December 2013.

Internationally, Canada has funded regional workshops and provided follow-up assistance for the purpose of assisting other countries with the implementation of CPPNM/A through identifying and addressing obstacles to ratification. Project funding disbursed in this regard is \$448,130 since October 2011.

UN SECURITY COUNCIL RESOLUTION 1540

Canada continues to be a strong advocate for the full and universal implementation of UN Security Council Resolution (UNSCR) 1540. The Resolution places several binding obligations on States to enhance the security of nuclear materials, in line with the objectives of the Nuclear Security Summit.



Canada reflects its domestic nuclear security efforts in its reporting relevant to UNSCR 1540, such as its recently revised national 1540 implementation matrix. Canada's first report was submitted to the 1540 Committee in December 2004, with subsequent reports submitted in March 2006 and January 2008. Canada has also submitted a Summary Action Plan to the 1540 Committee in August 2010 as encouraged in OP4 of UNSCR 1810. In addition, Canada is also working with partners, including through its 2014 Nuclear Security Summit gift basket and programming and capacity-building projects funded by its Global Partnership Program (see section #4), to encourage countries to achieve the full implementation of the Resolution, including through the provision of 1540 capacity building assistance. Canada is also in the process of updating its National Action Plan on 1540 implementation.

IAEA REGULATIONS FOR SECURITY AND CONTROL OF NUCLEAR MATERIALS AND FACILITIES

The Nuclear Safety and Control Act applies to all government entities with the only exemption being Canada's Department of National Defence (DND) and the Canadian Armed Forces (CAF). However, these entities have indicated that they intend to meet national requirements for the security and control of nuclear materials and facilities, as specified in the Canadian Nuclear Safety Commission's (CNSC) Nuclear Security Regulations and the Nuclear Non-Proliferation Import and Export Control Regulations. Both of these documents are in line with IAEA recommendations and Canada's international commitments. In practice, DND/CAF accomplishes security through an internal regulatory regime that includes detailed authorizations and oversight of departmental programs as well as individual units and facilities.

2. STRENGTHENED NATIONAL NUCLEAR AND RADIOLOGICAL MATERIAL SECURITY SYSTEMS, INCLUDING MEASURES TO SHOWCASE THE EFFECTIVENESS OF NUCLEAR SECURITY EFFORTS

NUCLEAR SECURITY

Current Canadian regulations are based on the IAEA Nuclear Security Series documents, in particular the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Rev.4 and the vast majority of Rev.5). Canada has strengthened its domestic security requirements by producing new Regulatory Documents and updating others such as requirements for Nuclear Response Forces. One of these requirements is related to performance testing at high-security nuclear sites such as nuclear power plants. This performance testing includes Force-on-Force exercises (staged physical assaults on facilities) to realistically evaluate on-site security systems and personnel. Force-on-Force exercises involve actual. The Design Basis Threat Analysis is being updated currently and measures to produce strengthened Fitness for Duty requirements, particularly for persons entering a protected area, are in development.

The Nuclear Threat Initiative's "Nuclear Materials Security Index" ranks Canada second in the world for nuclear materials security conditions among countries with weapons-usable material. The index includes Canada among the three most improved states. Canada's ranking improved from 10th (in 2012) to 2nd place in 2014.

As such, building upon Canada's strong domestic nuclear security measures and experience, Canada is active in supporting efforts to implement key physical protection upgrades at nuclear facilities around the world. Through its Global Partnership Program, Canada has funded projects worth \$23.6 million since 2012, providing training, equipment and infrastructure to support overall capacity and nuclear security levels in countries across two regions.

RADIOLOGICAL SECURITY

In 2013, the CNSC approved and published regulatory document REGDOC 2.12.3 "Security of Nuclear Substances: Sealed Sources" to implement security requirements for category 1, 2 and 3 radioactive sealed sources and to provide security guidance for category 4 and 5 radioactive sealed sources. This document provides information on the minimum security measures that must be implemented to prevent the loss, theft, unauthorized access or potential malicious use of radioactive sources during their use, storage or transport. This document is aligned with the IAEA Code of Conduct on the Safety and Security of Radioactive Sources as well as IAEA document Nuclear Security Series (NSS) 14 – Nuclear Security Recommendations on Radioactive Material and Associated Facilities.



The CNSC has also engaged Canadian licensees and industry stakeholders through a variety of outreach activities to promote the security of radioactive sources in order to enhance understanding of security measures that should be implemented to prevent, detect and respond to security events related to high risk radioactive sources.

Canada continues to support and encourage States to fully implement the import and export control provisions of the IAEA Code of Conduct on the Safety and Security of Radioactive Sources and its supplementary Guidance on the Import and Export of radioactive Sources. Furthermore, it is necessary to keep in line with NSS 14 – Nuclear Security Recommendations on Radioactive Material and Associated Facilities, in order to implement and maintain a nuclear security regime for Category 1 and 2 radioactive sources.

Canada is one of the world's largest suppliers of highly radioactive sealed sources and supports their protection from potential loss, theft and malicious use. Since March 2012, Canada's Global Partnership Program has contributed more than \$2.2 million to enhance the physical security and local capacity to manage highly radioactive sources used in beneficial applications such as cancer treatment in countries and regions with identified needs. Building upon long-standing efforts to secure and decommission radiological sources, Canada is also working with the US and other partners to implement projects in Latin America and Africa to secure Canadian-origin radiological sources.

Canada has also recently funded the development of a new World Institute for Nuclear Security Best Practice Guide on the Security of Radioactive Sources Used in Medical Applications, released at the 2014 NSS and currently available in four languages (English, French, Spanish, Arabic). In addition, Canada regularly contributes relevant technical expertise to related international guidance development and assistance coordination efforts, including the IAEA's International Working Group on Radioactive Source Security. Radiological security is an important pillar of Canada's international nuclear and radiological assistance under its renewed Global Partnership Program (GPP).

3. CONTRIBUTION TO AND USE OF THE IAEA'S NUCLEAR SECURITY-RELATED ACTIVITIES AND SERVICES

Canada is an active contributor to the development of the IAEA's Nuclear Security Series, most recently by participating in the Nuclear Security Guidance Committee and assisting in the development of documents within the Nuclear Security Series. Leadership in this area has been demonstrated by Canadians working and, in some cases chairing the consultancy meetings in these areas.

Canada also contributes to the IAEA's Nuclear Security Fund, and currently ranks as the third-largest national contributor, having contributed over \$17 million through the GPP since 2004. Canada joins other NSS participants in calling for greater contributions by IAEA Member States and other donors to the Nuclear Security Fund.

Canada recognizes the importance of nuclear forensics in support of Canadian and international law enforcement nuclear security efforts. As such, Canada is undertaking a comprehensive national project designed to promote the development of a national Nuclear Forensics (NF) capability. Canada is also working on the development of technical practices related to nuclear forensics with a number of international partners, including Israel, the Netherlands and the US. Further, Canada is an active participant in international dialogues on nuclear forensics, including within the International Technical Working Group (ITWG), the Global Initiative to Combat Nuclear Terrorism (GICNT) and at the IAEA.

Canada further supports the work of the IAEA in nuclear forensics and has demonstrated this through participating as a Programme Committee member for the upcoming International Conference on Advances in Nuclear Forensics, reviewing submitted abstracts and providing support for the organization of the conference.

Canada is currently discussing with the IAEA regarding the timing for an International Physical Protection Advisory Service (IPPAS) mission in 2014/2015. Discussions with the IAEA are being facilitated by the CNSC. Canada is a strong proponent in the voluntary disclosure of information from IPPAS missions in order to better build up a global repository of best practices and lessons learnt. Canada also acknowledges the need for States to prioritize safety and



security. Canada has also been active in assisting the IAEA in its undertaking of IPPAS missions to other countries including the United Kingdom, Hungary, Romania, the US and Australia.

4. SUPPORT FOR NUCLEAR SECURITY-RELATED INTERNATIONAL ACTIVITIES

Canada participates in the G-8 Nuclear Safety and Security Group (G-8 NSSG) and the Global Initiative to Counter Nuclear Terrorism (GICNT), contributes to the Global Threat Reduction Initiative (GTRI), the Proliferation Security Initiative (PSI), INTERPOL and the Global Partnership Against the Spread of Weapons and Materials of Mass Destruction (GP) and works with the UN 1540 Committee.

GLOBAL INITIATIVE TO COMBAT NUCLEAR TERRORISM (GICNT)

Canada joined as an initial partner nation of the GICNT and remains an active participant in GICNT events, including the Implementation and Assessment Group and annual plenary meetings. Within the GICNT, Canada leads in the development of technical products in areas associated with nuclear forensics. In May 2012, Canada hosted a GICNT tabletop exercise, Toronto RADEX 2012, on capabilities for response, mitigation, and investigation of terrorist attacks and for information sharing. It was attended by over 100 participants representing 14 GICNT members.

PROLIFERATION SECURITY INITIATIVE (PSI)

Canada views the PSI as an important whole-of-government tool for enhancing national capabilities as well as providing the necessary international coordination required for effective WMD interdiction. Through capacity-building exercises, the exchange of information and best practices, and participation in practical exercises, Canada is working with other PSI partners to enhance collective abilities to disrupt illicit shipments of nuclear and radiological weapons and related materials by sea, land, and air, including during transit and transshipment.

Canada strongly supported the four joint declarations which were agreed to at the 2013 PSI High Level Political Meeting, which, inter alia, called for enhanced outreach to encourage new countries to endorse the PSI Statement of Interdiction Principles, efforts to strengthen national and international authorities for WMD interdiction, and continued work to build the critical capabilities and practices required for effective WMD interdiction. Canada will fund a regional PSI Seminar in the Caribbean in June 2014 to bring together CARICOM partners to encourage their participation in the PSI and to enhancing WMD interdiction-relevant capabilities and cooperation in the region. Domestically, Canada remains committed to assessing and improving its own WMD interdiction-related coordination and capabilities and will continue to share domestic lessons learnt with partners by participating in PSI events and contributing materials to the CCP Tools and Resources Library.

GLOBAL PARTNERSHIP AGAINST THE SPREAD OF WEAPONS AND MATERIALS OF MASS DESTRUCTION (GP)

In 2010, as part of its NSS deliverables, Canada announced \$120 million in funding through the Global Partnership Program (GPP) for ongoing nuclear security programming in Russia. At the 2012 Seoul Nuclear Security Summit, Prime Minister Harper announced the renewal of the GPP's mandate for an additional 5 years (2013-2018) with anticipated yearly funding of \$73.4 million for global programming to reduce the threat of WMD terrorism. As such, since the 2012 Summit, Canada has spent committed over \$25.8 million onto global nuclear security programming as part of its activities through the 27-member Global Partnership. In addition, Canada actively aims to expand membership to adequately represent all regions in this important mechanism for coordinating global nuclear security programming.

UNSCR 1540

Canada's GPP UNSCR 1540 programming unit is working to reduce the threat posed by terrorist acquisition of WMDs and related material by increasing countries' capacity to implement obligations under UNSCR 1540 which places binding obligations on all UN State Members to take measures to prevent the proliferation of nuclear, chemical and biological weapons and their means of delivery, and establish appropriate domestic controls over related materials to prevent their illicit trafficking. The three main pillars of UNSCR 1540 programming are: 1) providing CBRNe and other related training and equipment; 2) providing legislative and regulatory assistance with CBRN related treaties; 3) supporting enhancement of export controls and border security systems.



Examples of GPP UNSCR1540 projects include:

- Support for six regional capacity-building workshops in different locations worldwide related to the universal implementation of nuclear security-related international legal instruments;
- Provision of CBRNe threat or incident response planning and training by the Canadian National CBRNe Response Team;
- Provision of CBRNe detection and protection equipment;
- Contribution of on-site inspection equipment to the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO);
- Support of legislative assistance to ensure the non-proliferation of chemical, biological, radiological and nuclear (CBRN) weapons and related materials in Latin America and Southeast Asia; and
- Support to enhance capacities of Asian ports in detecting and interdicting Weapons of Mass Destruction (WMD) and increasing regional capacity to prevent the proliferation of WMD and related materials by state and non-state actors.

INFORMATION AND CYBER SECURITY

Canada has systems in place involving ongoing surveillance and oversight under the auspices of its nuclear regulatory body, the Canadian Nuclear Safety Commission (CNSC). These systems are aligned with IAEA documents and best practices based on existing standards.

CNSC controls the export of nuclear technology under the Nuclear Safety and Control Act, consistent with guidelines of the Nuclear Suppliers Group (NSG) export control regime. Best practices are shared at inter-utility security working group meetings and by affected stakeholders in the development of guides and standards. Industry input is brought into the development of best practices. Industry also assists in the development of Canadian Standards Association standards.

Canada is working toward the development and issuance of a national standard for cyber protection which reflects international best practices. Further, the CNSC facilitates the distribution of the Government of Canada's Cyber Incident Response Centre's Operational Summaries to nuclear licensees.

Canada has established regulations and procedures for the vetting and supervision of all nuclear industry staff.

Canada currently has regulatory requirements pertaining to programs for security awareness training and supervisory behaviour.

5. CONTRIBUTION TO MINIMIZATION OF SENSITIVE NUCLEAR MATERIALS

Canada remains strongly committed to the minimization of Highly-Enriched Uranium (HEU). In this regard, Canada has made strong progress on both the domestic and international fronts.

Canada has provided approximately \$8 million for successful US-led reactor conversion and HEU cleanout projects in Mexico (\$5 million) and Vietnam (US\$3 million) and is currently assisting in a US-led reactor conversion and cleanout project in Jamaica through AECL, with an expected completion date of early 2015. Domestically, Canada has converted some research reactors from HEU to Low-Enriched Uranium fuel.

Canada is committed to eliminating the use of HEU in the production of medical isotopes, consistent with its non-proliferation goals. In this regard, Canada has announced its intention to cease the production of Mo-99 from AECL's Chalk River National Research Universal (NRU) reactor in 2016, thereby eliminating HEU-based isotope production domestically. Canada is investing in alternative production technologies that do not use HEU and reduce radioactive waste in isotope production, leading to a more diverse and secure supply of isotopes in the long term. The government continues to work nationally and internationally to promote security of supply of medical isotopes.



Canada is also engaged in repatriation of its US-origin HEU fuel, and has made significant progress in implementing commitments made at the 2010 Nuclear Security Summit (NSS). A second shipment of spent HEU fuel was returned to the US in 2012, and further shipments are planned for fiscal year 2014-15 and beyond. The objective is to return spent HEU fuel stored at Chalk River Laboratories to the US by the end of 2018.

Further, following the Prime Minister's March 2012 announcement to expand the repatriation initiative to include the return of additional HEU materials stored at Chalk River Laboratories, a second initiative was launched to repatriate AECL's inventory of HEU-bearing liquids that were generated as a by-product from the production of medical isotopes. AECL and the US Department of Energy (USDOE) have agreed on the terms for the repatriation of this material, and initiated plans and preparations for this work.

AECL also has a small number of booster rods from the operation of three prototype CANDU reactors in Ontario and Quebec. Pursuant to the 2012 NSS announcement, Canadian officials continue to work with their US counterparts to include HEU booster rods in the HEU Gap Program – a program established to address orphaned items that are not eligible for the US DOE Fuel Return Program.

Other HEU repatriation activities since the last NSS that have also contributed to the reduction of HEU materials in Canada include the repatriation of the HEU SLOWPOKE reactor core from Dalhousie University in 2012, and the repatriation of several thousand HEU MAPLE targets from Chalk River Laboratories in 2013.

6. ESTABLISHMENT OF CENTRE OF EXCELLENCES (COEs) AND SUPPORT

Canada is examining the potential to develop a Centre of Excellence (COE) to connect expertise from government, industry, regulators and academic institutions. Several countries have now established, or are planning to establish, nuclear security centres of excellence. Through its Global Partnership Program, Canada is exploring the possibility of implementing future projects, through these international COEs

7. ENHANCED EFFORTS TO COMBAT ILLICIT TRAFFICKING IN NUCLEAR AND RADIOLOGICAL MATERIALS

To combat illicit trafficking, Canada participates in international information sharing on illicit trafficking in nuclear material through contributions to the IAEA Incident and Trafficking Database (ITDB) and through bilateral cooperation.

Canada continues to implement a risk-based security compliance inspection program of licensing of radioactive sources, and has implemented comprehensive import and export control programs for both Category 1 and 2 radioactive sources.

8. STRENGTHENED COOPERATION BETWEEN GOVERNMENT AND NUCLEAR INDUSTRY

Canada will continue to place high importance in strong cooperation between industry and government as such cooperation is a key part of ensuring both domestic relevance and transparency in the creation of domestic compliance systems.

As such, Canada has invested approximately \$60M for research and development of non-reactor based technologies such as cyclotron and linear accelerator technologies for the production of the key medical isotope technetium-99m. This includes funding for Natural Resources Canada's Non-reactor-based isotope Supply Contribution Program in 2010 - 2012 and the current Isotope Technology Acceleration Program to further accelerate the development of these technologies to encourage commercial uptake from industry.

The CNSC bases its security measures for the storage and transportation of radioactive sources on the IAEA Code of Conduct for the Safety and Security of Radioactive Sources. The CNSC continues to implement a risk-based security compliance inspection program for licensees of radioactive sources. CNSC staff meet with the Inter-Utility Security Working Group Committee who represent AECL and Nuclear Power Plant operators on a regular basis to discuss a variety of nuclear security related items including security exercises, training and intelligence sharing.



Raising security awareness in the nuclear sector is a priority for the Government of Canada. The national regulator actively participates in outreach programs to industry, seeks their input into the development of Regulatory Documents and national standards (Canadian Standards Association documents) and best practices. Both government and industry representatives are actively involved in the development of international recommendations, guidance and best practice guides, both through the IAEA and the World Institute of Nuclear Security (WINS).

Canada continues to participate in five multilateral export control regimes created to prevent the spread of WMD equipment and technology: the Nuclear Suppliers Group (NSG) and Zangger Committee (ZC), the Australia Group (AG), the Missile Technology Control Regime (MTCR) and the Wassenaar Arrangement (WA). Under these arrangements, Canada has undertaken to control measures to prevent the export of goods and technology that can be used in WMD programs or WMD delivery systems. The Government of Canada provides information to exporters regarding implementation of requirements under the Export and Import Permits Act and the Nuclear Safety and Control Act, which codify in Canadian law Canada's political commitments made through participation in the five foregoing regimes.