



DNSR Newsletter

Evaluation of the role of radiation safety officers

Overview

At the September 22, 2016 public meeting presentation on the 2015 *Regulatory Oversight Report on the Use of Nuclear Substances in Canada*, the Commission identified specific issues in operational structure and performance of radiation protection programs, with some licensees undergoing transitions such as amalgamations. The Commission directed staff to evaluate and recommend a regulatory approach for nuclear substances and radiation devices (NSRD) radiation safety officers (RSOs). Through its robust compliance program, the CNSC ensures that licensees maintain effective programs through any transition.

In response, DNSR has developed a strategy to improve, strengthen and standardize regulatory oversight of the RSO and improve licensee radiation protection programs (RPPs) and regulatory compliance. This strategy includes a collective evaluation of RSO performance by analyzing the contributing factors that make them successful in their role, as well as the development of a new regulatory document that will provide additional guidance for licensees on the design and implementation of an effective RPP. The scope of this evaluation is limited to NSRD RSOs responsible for nuclear substance and radiation device licensees (Class II RSOs are not part of this evaluation).



The evaluation has relied on the expertise of an RSO working group made up of RSOs actively working in the medical and academic/research sectors. Representatives are from Radioprotection Inc., Simon Fraser University and the Winnipeg Regional Health Authority.

The working group's input was instrumental in developing the evaluation plan and design.

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How evaluation findings will inform regulatory guidance

The objective of the evaluation is to examine how RSOs responsible for oversight of NSRD licences contribute to the effectiveness of radiation protection programs. This evaluation is intended to help understand the factors that contribute to or detract from the effectiveness of RSOs. These factors can include:

- the licensee organizational structure
- the level of management support for the RSO
- the reporting relationship with the applicant authority
- the existing regulatory guidance provided by the CNSC
- the RSO training and qualifications
- the perceived credibility, trust and respect of the RSO within their organization

The evaluation results will be used to make an evidence-based decision regarding further regulatory intervention in this area.



Evaluation supports continuous learning and improvement of programs, policies, processes and initiatives.

Using sound, well-documented practices, research and analyses, an evaluation provides evidence of the effectiveness and efficiency of programs at the CNSC.

Evaluation project progress to date

You may have seen evaluators at your site in February and March as they toured the country conducting interviews. With the data collection phase nearing completion, over 80 interviews have been completed with a sample of RSOs, applicant authorities and radiation protection program workers across Canada.

In addition, a total of three surveys were administered to:

1. all medical and academic/research RSOs
2. a random sample of applicant authorities
3. a small sample of radiation protection program workers

The combination of these lines of evidence provides the project with breadth and depth of information in support of the evaluation analysis and reporting phase.

The CNSC provided an update on this project and lead an interactive workshop at the [Canadian Radiation Protection Association](#) conference in Québec City in early May.

The final evaluation report will present its findings in late summer/early fall 2018 to inform DNSR's regulatory documentation and intervention in this area.

Stay tuned to future editions of the DNSR newsletter for an update on this evaluation. In the meantime, contact cncs.evaluation.ccsn@canada.ca for any questions about this evaluation project.

Lessons learned in nuclear medicine

Earlier this year, the CNSC received a report of skin contamination to the wrist as a result of a loose syringe shield. The event was presented to the Commission on [March 15, 2018](#). A nuclear medicine technologist was preparing a technetium-99m product used for lung scan doses when the syringe shield slipped in the worker's hand and squirted technetium-99m onto the technologist's bare wrist. The worker washed and decontaminated the area. The estimated dose received as a result of the event was 3,600 mSv. This is above the regulatory limit of 500 mSv. The worker has not reported any health effects as a result of localized exposure.

The worker was wearing a lab coat and gloves at the time of the incident, but indicated that the gloves may not have been pulled up over the cuffs of the lab coat. The licensee has purchased long-cuffed gloves and included a verification of the syringe shield tightness to prevent recurrence of a similar type of incident.

New resources for portable gauge users

Attention portable gauge users: The CNSC has developed new resources for you.

These resources do not replace worker training. They are information tools for workers who are already trained in the use of portable gauges.

Working Safely With Portable Gauges booklet

- contains guidelines for the safe handling and use of portable gauges
- features topics including:
 - ✓ keeping doses ALARA (as low as reasonably achievable)
 - ✓ keeping track of radiation doses, using personal dosimeters and counting shots
 - ✓ responsibilities of portable gauge users
 - ✓ routine maintenance
 - ✓ training requirements
 - ✓ safe storage of gauges
 - ✓ general steps in case of an incident during use, storage or transport
 - ✓ what to do before starting work, at the job site and at the end of a job

“Stay safe working with portable nuclear gauges” video

- an overview that covers many of the same topics as the booklet

Both the video and the booklet are available on the CNSC website.

Notice to users of Humboldt Type A packages for portable gauges (model HS-200169)

Humboldt Scientific Inc., a manufacturer of radiation devices, sent a letter to their distributors in Canada and the United States indicating that the Type A package model HS-200169 for portable gauges (blue wooden package) does not meet the specifications of a Type A package. The CNSC would like to remind licensees who transport or ship Type A packages that it is the responsibility of the person who prepares the Type A package for shipment to keep a record of the documents demonstrating that the package meets the requirements of the transport regulations, as per section 42 of the *Packaging and Transport of Nuclear Substances Regulations, 2015* (PTNSR 2015). Section 42 specifies that the following information concerning the package must be kept:

- (a) the technical specifications of its design;
- (b) the type, quantity and physical state of the radioactive material that it is designed to contain;
- (c) any document that demonstrates that the package meets the requirements of these Regulations and the management system; and
- (d) instructions for packing, transport, receiving, maintenance and unpacking

Consequently, users may:

1. demonstrate that the Humboldt model HS-200169 meets the requirements of the PTNSR 2015
2. design their own or use another Type A package and demonstrate that it meets the requirements of the PTNSR 2015
3. purchase the new package designed by Humboldt that replaces model HS-200169

The requirements for Type A packages are referenced in paragraph 635 of the [IAEA SSR-6 Regulations for the Safe Transport of Radioactive Material – 2012 Edition](#)

Reminder – REGDOC-2.12.3 comes into effect May 31, 2018 for category 3, 4 and 5 sealed sources

The CNSC would like to remind users of category 3, 4 and 5 sealed sources that the licence condition related to the implementation of [REGDOC-2.12.3, Security of Nuclear Substances: Sealed Sources](#) will become effective on May 31, 2018.

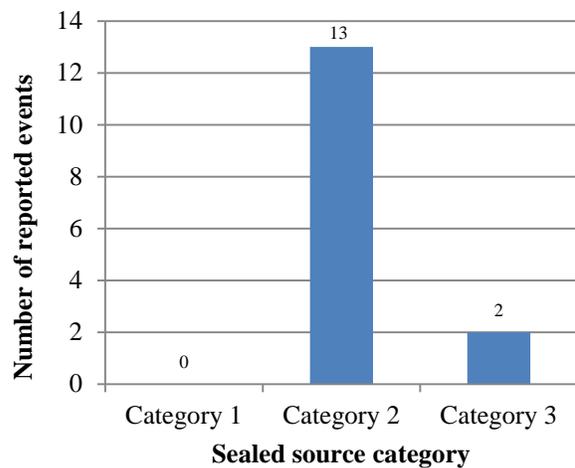
For further information, contact your CNSC licensing specialist or project officer, or refer to [REGDOC- 2.12.3, Security of Nuclear Substances: Sealed Sources](#).

Research project on tracking technologies used for category 2 and 3 sources in industrial radiography and logging industry

Lost and stolen sources represent a risk to safety and security, as sources out of regulatory control could be used by malicious actors. Since 1991, approximately 90 events involving the theft of nuclear substances were reported to the Canadian Nuclear Safety Commission. Of these sources, approximately 66% have not been recovered. As seen in figure 1, only 15 of these sources were categories 2 and 3; none were category 1. In recent years, between 2011 and 2016, there were only two reported incidents of stolen category 2 sources (2014 and 2016) and one reported incident of a stolen category 3 source (2014).

Category 2 sealed sources, if not safely managed or securely protected, could cause permanent injury to a person handling or coming in contact with them for a short period of time (minutes to hours). Unshielded proximity to the source for several days could prove fatal. Category 3 sources, if not safely managed or securely protected, could cause permanent injury to a person who handles or otherwise comes in contact with them for a few hours. Proximity to this amount of unshielded radioactive nuclear substances for a period of days to weeks is unlikely to – though could possibly – prove fatal.

Figure 1: Number of reported events of lost and stolen category 1, 2 and 3 sources, 1991-2016



The United States, France, Vietnam and South Korea are representative of the growing number of countries developing tracking technologies to be used during the transportation of high-risk radioactive sources (such as those used in industrial radiography and logging) as part of their nuclear regulatory regime. These new technologies are used to track either the radioactive device itself or the package in which the device is transported. To protect the safety and security of the Canadian public, the CNSC requires vehicles carrying Category I, II and III nuclear material and category 1 radioactive sources to be tracked by the licensee during transport. For transport of category

2 sources, licensee must verify that the carrier use a GPS or package tracking system. To follow IAEA and industry good practices, the CNSC has initiated a research project that aims to better understand the use of new tracking technologies for devices with radioactive sources and their applicability to the Canadian environment.

As part of this research project, a survey went out to Canadian licensees and international counterparts including the IAEA and other regulators. The survey will gather information on the use of tracking systems and associated technologies for category 2 and 3 radioactive sources in transport, specifically those used in industrial radiography and well logging. The intent of the survey is to identify what technologies are currently being used and



why, as well as the costs, benefits and challenges that arise from implementing tracking technologies. Moreover, the survey seeks general stakeholder opinions – including those of both current users and non-users – on tracking technologies.

The CNSC plans to finish the research paper in the fall of 2018, after which it will be shared with relevant stakeholders. For more information about this project or if you wish to participate in the survey, please contact Courtney Hynes at courtney.hynes@canada.ca or Raphael Duguay at raphael.duguay@canada.ca.

Radionuclide Information Booklet

Did you know that the CNSC’s *Radionuclide Information Booklet* is available [online](#)? This document is aimed at radiation protection specialists at facilities licensed by the Canadian Nuclear Safety Commission (CNSC). It provides practical information on various nuclear substances, including their radiation characteristics, detection methods, preventive measures and annual limits on intake.

CNSC expectations regarding the security of category 1-3 sealed sources while in transport

Requirement

As of May 31, 2018, all CNSC licensees possessing sealed sources must comply with the security requirements outlined in [REGDOC-2.12.3: Security of Nuclear Substances: Sealed Sources](#). Section 4.2 of this regulatory document provides information specifically on the licensee’s responsibilities regarding transport security.

Discussion

With the transport of the sealed sources, the “licensee” specified in REGDOC-2.12.3 is considered the consignor. As per Canada’s *Transportation of Dangerous Goods Regulations* (TDGR), a consignor is a person in Canada who:

...is named in a shipping document as the consignor; imports or who will import dangerous goods into Canada; or ... if [the above two definitions] do not apply, has possession of

dangerous goods immediately before they are in transport.

The consignee is the recipient of the shipment. It should be noted that, as indicated previously, in certain cases, a Canadian licensee is both consignor and consignee when the radioactive source is being imported from outside Canada. Furthermore, the TDGR define a carrier as the person who, whether or not for hire, has possession of the dangerous goods while they are in transport.

Guidance

Licensees may meet these requirements by requesting written confirmation from the carrier or the company contracted to oversee the shipment that that carrier or company is capable of providing the security measures outlined in REGDOC-2.12.3. This can be done in the form of a confirmation letter from the carrier; included as a term within a contract; or done in the form of written verification that the company overseeing the shipment is a CNSC licensee with this regulatory document stipulation in its licence. There will be no need to revisit the confirmation after a certain time frame as long as the same carrier is maintained.

A high dose rate brachytherapy unit (A) and a package (B) for the sealed sources it uses



Update on CNSC’s regulatory framework

Over the past five years, the CNSC has made significant progress towards its goal of modernizing the regulatory framework by 2020. The following information is provided in order to inform nuclear substances and radiation devices licensees, as well as Class II facilities, of the latest activities related to this modernization initiative. The regulatory documents referenced below either contain requirements or provide useful guidance and information for DNSR licensees.

Recently published:

- REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy* (published in February 2018) – **requirements and guidance**

This regulatory document sets out requirements and guidance for safeguards programs for applicants and licensees who:

- possess nuclear material, and/or
- operate a uranium and/or thorium mine, and/or

- carry out specified types of nuclear fuel-cycle related research and development work, and/or
- carry out specified types of nuclear-related manufacturing activities

The requirements and guidance in REGDOC-2.13.1 are essential to Canadian compliance with the safeguards agreements entered into with the International Atomic Energy Agency (IAEA) and are consistent with modern national and international practices.

- REGDOC-2.5.5, *Design of Industrial Radiography Installations* (published in March 2018) – **guidance only**

Licensees performing industrial radiography work are ultimately accountable for meeting regulatory requirements, regardless of where the radiography is being performed. This regulatory document is a tool to provide guidance for the design of industrial radiography installations. This information will assist individuals in the design and construction of installations that are safe to use, and that help to ensure that doses to certified exposure device operators and all persons in the vicinity of the work being performed are within regulatory limits and kept as low as reasonably achievable (ALARA).

- REGDOC-1.5.1: *Application Guide: Certification of Radiation Devices or Class II Prescribed Equipment* (spring 2018) – **guidance only**

This guide is intended to help applicants to prepare and submit applications to the CNSC for certification of radiation devices and Class II prescribed equipment. It assists applicants and licensees in complying with the *Nuclear Safety and Control Act* (NSCA) and regulations, and ensures that:

- the radiation device or Class II prescribed equipment is safe to use

- adequate measures are in place to protect the environment, the health and safety of persons, and national security
- the design meets Canada's international obligations

Soon to be published:

- REGDOC-2.1.2, *Safety Culture* (spring 2018) – **guidance only**

This regulatory document sets out requirements and guidance for Class I licensees and uranium mines and mills. REGDOC-2.1.2 also contains information to help Class II and nuclear substance licensees learn more about their organization's safety culture. This document provides more specific requirements and guidance related to safety culture, elaborating on the management system requirements contained in CSA standard N286.

Final draft in development:

- REGDOC-2.7.3, *Radiation Protection Guidelines for Safe Handling of Decedents* (summer 2018) – **guidance only**

This regulatory document provides guidance to death-care professionals and the public on handling decedents who have undergone therapeutic procedures involving nuclear substances to ensure that radiation exposure is kept below limits that have been set to protect the public. Background information is provided on procedure types, the risks they present and methods for reducing the potential for exposure.

- REGDOC-1.4.1, *Licence Application Guide: Class II Nuclear Facilities and Prescribed Equipment* (fall 2018) – **guidance only**

This regulatory document provides information to applicants in preparing and submitting applications for a licence to carry out activities related to Class II nuclear facilities and prescribed equipment. This

guide will help applicants prepare the information that the CNSC uses to determine if they are qualified, have made adequate provision for the protection of the environment and health and safety of persons, and otherwise meet the requirements of the provisions of the NSCA and its regulations.

Soon to consult:

- REGDOC-2.1.1 *Management System* (spring 2018) – **guidance only**

This regulatory document consolidates CNSC expectations for the “management system” safety and control area (SCA), as well as applicable references in the legislation. REGDOC-2.1.1 contains supplemental information on CNSC expectations on meeting requirements in CSA N286. The regulatory document will also be used as a vehicle to provide supplemental information on various and emerging issues in the management system area.

- REGDOC-3.1.3, *Reporting Requirements for Class II Nuclear Facilities and Users of Prescribed Equipment, Nuclear Substances and Radiation Devices* (spring 2018) – **requirements and guidance**

This regulatory document consolidates and clarifies requirements found in the NSCA and regulations made under it. It provides guidance for reports and notifications that licensees must submit to the Commission. It also provides details on the events, situations and dangerous occurrences that licensees of Class II nuclear facilities and users of prescribed equipment, nuclear substances and radiation devices must submit to the CNSC. The document presents the types of reports and the applicable time frame for reporting.

For more information on regulatory documents, please consult [the regulatory documents index on our website](#).

In keeping with the CNSC’s commitment to stakeholder engagement, comments and suggestions on any regulatory document may be submitted to the CNSC at any time through our consultation account (cnscconsultation.ccsn@canada.ca). As part of ongoing efforts to enhance and clarify the CNSC’s regulatory framework, the CNSC will use these comments to inform future reviews of its regulatory tools. Comments received outside the formal consultation period will not be publicly dispositioned.

Submitting an ACR? Be sure to use the correct form

The CNSC will reject your ACR for the following reasons:

1. submission of an obsolete form that has been superseded
2. submission of a form for an incorrect use type

If this occurs, you will be required to re-submit your ACR.

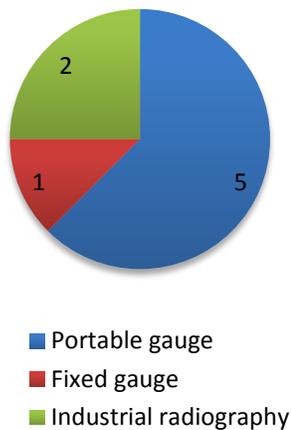
Note that you may include supplemental information however it must be accompanied by the correct and complete ACR form and the form must include references to the supplemental information provided.

Not sure which form to use? Check your licence. Licence condition 2912, 2914 or 2916 will appear on your licence. The condition will specify the date your ACR is due and where to find the correct form.

You can also find all ACR forms at www.nuclearsafety.gc.ca/acr

CNSC Regulatory Actions

To protect the health and safety of workers, the public and the environment, the CNSC issues regulatory actions to non-compliant licensees. Eight orders and two administrative monetary penalties (AMPs) were issued to DNSR licensees between September 1, 2017 and February 28, 2018. All were issued to users in the industrial sector.



- Five orders were issued to portable gauge licensees.
 - In three cases, workers failed to maintain security of the gauge at worksites.
 - The other two orders were issued following inspections that identified deficiencies in management oversight of the radiation protection program.
- One AMP was issued to a portable gauge licensee as a result of multiple instances of non-compliance identified during an inspection and a recent history of failing to maintain direct supervision of portable gauges at work sites.
- Two orders were issued to licensees who perform industrial radiography.
 - One was issued after an inspection that identified deficiencies in management oversight of the radiation protection program.
 - The other was issued because a certified exposure device operator (CEDO) was not properly supervising a trainee; an AMP was issued to the CEDO concerned.
- One order was issued to a fixed gauge licensee when an inspection identified multiple non-compliances related to vessel entry procedures.

Orders issued September 1, 2017 – February 28, 2018

Industrial sector – portable gauge

[42256 Yukon Inc.](#)

[Groupe Conseil SCT Inc.](#)

[GHD Consultants Ltd.](#)

[Seymour Pacific Developments Ltd.](#)

[Acciona Infrastructure Canada Inc.](#)

Industrial sector – industrial radiography

[Bakos NDT Ltd.](#)

[The Graff Company ULC](#)

Industrial sector – fixed gauge

[International Paper Canada Pulp Holdings ULC](#)

AMPs issued September 1, 2017 – February 28, 2018

Industrial sector – portable gauge

[Groupe ABS Inc.](#)

Industrial sector – industrial radiography

[Brian Bakos](#)