



Reporting events to the Canadian Nuclear Safety Commission (CNSC)

CNSC duty officer available 24/7 at 1-844-879-0805 (toll free) or 613-995-0479

Regulations require that certain types of events be reported to the CNSC. All initial event reports should be reported to the CNSC duty officer, who is available at all times. Your call will be taken by a contact centre representative, who will ask for pertinent information and arrange for the CNSC duty officer to return your call promptly. The CNSC duty officer follows procedures for reported events, collecting the facts and asking questions to gain a clear understanding of the situation. Duty officers ensure that the information you provide is passed on to the appropriate staff member.

What is an event?

An event is any unintended occurrence, including operating error, equipment failure or another

mishap, or deliberate action on the part of others, the consequences or potential consequences of which may be significant from the point of view of protection or safety for the licensed activity.

Legislation such as the Nuclear Safety and Control Act (section 45), the *Packaging and Transport of Nuclear Substances Regulations, 2015* (section 35), the *General Nuclear Safety and Control Regulations* (section 29), and the *Radiation Protection Regulations* (section 16), define the circumstances under which the CNSC must be immediately informed, as well as those under which a full report needs to be submitted, along with the time frames for submitting the full report.

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Notice to users of SPEC sources in exposure device model no. 880

The CNSC asks all users of SPEC sources in QSA Global exposure device model no. 880 to pay special attention to the ball stop located on the pigtail of the source lock. There were recent reports in the United States of the ball stop moving over time and preventing the source from being properly locked in the device. If this movement occurs and the exposure device cannot be locked, notify the CNSC duty officer at 1-844-879-0805 (toll free) or 613-995-0479.

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Whom to call

Contact the CNSC duty officer for immediate notification of events such as:

- motor vehicle accidents
- lost or stolen nuclear substances and radiation devices
- damage to a radiation device, such as a crushed gauge
- disconnection of a sealed source assembly from an exposure device remote control while in use
- failure of a sealed source assembly to return to the shielded position inside an exposure device
- failure of Class II safety systems during operation
- spill of a nuclear substance greater than 100 times its exemption quantity (EQ)
- potential exposure of a person to radiation in excess of the applicable dose limit (e.g., a person who crosses a cordoned area/barrier posted with radiation warning signs)
- strike or work disruption

Contact your CNSC licensing specialist or project officer directly to make the following notifications:

- package received with an incorrect transport index (TI)
- failure of Class II safety systems noted during the pre-operational check
- failure to follow internal procedure
- failure to perform a leak test as required
- reaching or exceeding an action level
- failure to perform a thyroid uptake in accordance with the licence condition
- amendment of a licence

Information to provide to the duty officer

The most important thing is to inform the CNSC of the situation in a timely manner, even if you do not have all the required information immediately. The CNSC duty officer will provide you with guidance and questions to answer as the situation evolves.

The duty officer will be looking for the following information:

- location and description of the situation
- actions taken or proposed with respect to the situation
- status of the situation (Is it under control? Is the spill contained? Is anyone hurt? Is the device damaged?)
- your CNSC licence number, if applicable
- any nuclear substances involved
 - for nuclear substances:
 - sealed/unsealed
 - isotope(s)
 - activity
 - serial number (sealed)
 - for a radiation device or prescribed equipment:
 - make
 - model
 - serial number
 - whether there is a survey meter onsite; if so:
 - provide the dose rate with units (mSv/h or μ Sv/h) and approximate distance from the source to where the reading was taken
- whether the media and the public have been informed of the event
- if the situation occurred during transport, indicate:
 - package type: Type A, Type B, excepted, etc.
 - the TI and category label (I-WHITE, II-YELLOW, III-YELLOW), if applicable
 - if you have a copy of the shipping document
 - if there are any road closures as a result of the event
 - if normal operations or activities have been disrupted as a result of the event

The CNSC is developing a series of regulatory documents to provide guidance on event-reporting requirements. REGDOC 3.1.2 – *part II* focuses on the reporting requirements for Class II nuclear facilities and nuclear substance and radiation device licensees, including when and what to report to the CNSC duty officer, timeframes for reporting, and notifications. It is expected to be published for public consultation in early summer.

International events in 2016

Countries using the International Nuclear and Radiological Events Scale (INES) are responsible for the classification and reporting of all events, and their associated rating on the INES.

The INES comprises seven classification levels. Most nuclear substance events are classified as levels 0, 1 and 2. Events classified as Level 0 are rated below INES and have no safety significance.

Level 1 events are classified as anomalies with minor safety impacts or reflect the loss of low activity sources/devices or transport packages. Level 2 events generally reflect higher doses, contamination or radiation levels, and a significant failure in safety provisions.

The majority of events reported in Canada in 2016 were classified as INES Level 0 to Level 2, a result similar to that of all countries using INES.

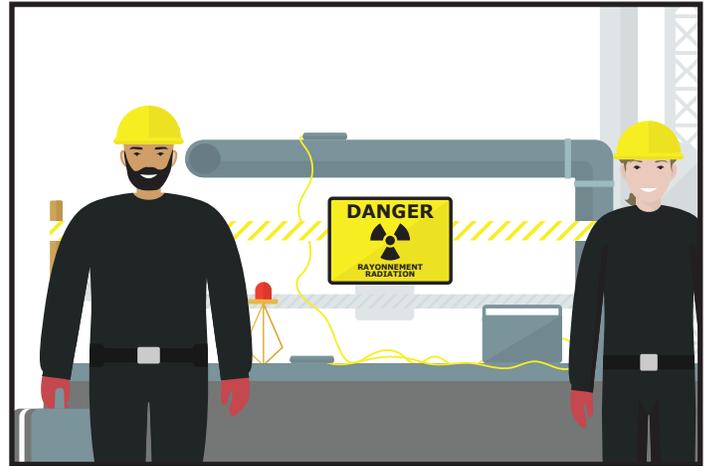
Note on annual compliance reports

Submitting an annual compliance report? Be sure to use the correct form

When completing your annual compliance report (ACR), be sure that the form you use is current and is for the correct use-type. Otherwise, the CNSC will reject your ACR, in which case you will have to resubmit it.

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

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



The International Atomic Energy Agency (IAEA) publishes data for all reports involving nuclear substance and radiation devices. Reporting events to the IAEA is voluntary. Worldwide in 2016, three Level 1 and eight Level 2 events were reported to the IAEA, primarily related to the overexposure of workers in the industrial radiography industry, and theft or loss of portable or fixed gauges.

All the events in this article were ranked as INES Level 2 (incidents).

Industrial radiography events reported worldwide in 2016

- While repairing a guide tube, a radiography exposure device operator failed to retract the source into the shielded position and accidentally placed his finger in the collimator porthole, exposing his finger. This resulted in an overexposure to the worker's finger.
- Industrial radiography work was being performed in an area with a known high radiation field when the alarm in the worker's electronic personal dosimeter began to sound. Despite alarms, the worker continued working. While no significant radiation dose was received, it was confirmed there were shortfalls in terms of adherence to safety procedures, with the potential of very high doses (100,000 mSv/hr).

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- A violation of safety procedures occurred when a worker was overexposed because of failure to ensure an adequate distance from the source. The radiographers' dosimetry report indicated a recorded dose of 55 mSv as a result of the event.
- A sealed source containing 1.3 TBq of selenium-75 was inadvertently damaged during repair work on faulty radiography equipment. Contamination was released outside the repair work control area, resulting in members of the public receiving doses slightly above the yearly allowable limit.
- A radiation protection officer failed to secure a radiography source, resulting in the sealed source being found by a 16-year-old boy, who took it home in his back pocket. As a result, an estimated 20 members of the public were exposed to a dose above the limit for members of the public.
- A radiography source was unknowingly transported in what was marked as an empty package and transported with general luggage on a passenger flight.

Nuclear substance events reported worldwide in 2016:

- An extremity dose of 511 mSv for the year was measured from a ring badge worn by a nuclear pharmacist. It was determined that the nuclear pharmacist was not following procedures and was holding radioactive material directly near his ring while performing his duties. The cause of the exposure was determined through reactive actions by the radiation safety officers where videotaping of the workers' adherence to procedures was reviewed.
- A cyclotron was operated while a bunker door was open. A worker entered the facility, assuming the door to the bunker was closed. Workers had been relying on the interlock system that was supposed to prevent operation with an open door, but there had been no checks since 2012 to ensure that the equipment was functioning as intended. The dose rate in the cyclotron bunker was estimated to be 10,000 mSv/hr. Workers stood at the bunker location for four minutes.

Event reporting in 2016 in Canada: Medical, industrial, commercial, and academic and research sectors

Under the Nuclear Safety and Control Act and its associated regulations, licensees are required to immediately inform the CNSC of events related to licensed activities. The International Nuclear and Radiological Event Scale (INES) is used to categorize events in the medical, industrial, commercial, and academic and research sectors. Additional information on the INES classification can be found on the [CNSC website](#).

The medical, industrial, commercial, and academic and research sectors provided 139 event reports to the CNSC in 2016.

- INES Level 0 (no safety significance): 136
- INES Level 1 (anomaly): 2
 - Both events reported loss or theft of portable gauges that have not been recovered. All lost, stolen or recovered radiation devices

and sealed sources are reported in the [Lost or Stolen Sealed Sources and Radiation Devices Report](#).

- INES level 2 (incident): 1
 - As a result of a spill, a nuclear energy worker received an extremity dose of approximately 1,100 mSv, which is above the regulatory limit of 500 mSv.

Grouped by event category:

- malfunctioning or damaged devices: 45
- spill, contamination or release: 20
- missing or found nuclear substances: 13
- packaging and transport: 44
- breach of security: 5
- unplanned exposure: 12

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CNSC staff review all response measures and corrective actions implemented by the licensees to ensure impacts to workers, members of the public and the environment are mitigated.

In addition to the events reported by licensees, a member of the public received an effective dose in excess of the annual whole-body regulatory limit

as a result of a driver transporting passengers while delivering packages containing nuclear substances. Transporting passengers while delivering packages containing nuclear substances is not authorized by the NSCA or its regulations, Transport Canada or the CNSC. As a result of this event, the driver was issued an administrative monetary penalty (AMP).

Controlling extremity exposure in nuclear medicine

Diagnostic and therapeutic nuclear medicine offer many benefits to patients with minimal risk to workers handling the radiopharmaceuticals. However, recent events demonstrate the importance of taking all required precautions to avoid unnecessary radiation exposure or contamination when handling unsealed nuclear substances. Always monitor hands immediately after handling unsealed nuclear substances.



Remember:

Contamination on the skin contributes a radiation exposure for as long as it is on the skin. Therefore, the earlier the contamination is detected and removed, the less the potential exposure.

Event 1

A worker was involved in the administration of yttrium-90 to a patient for synovial joint therapy. The worker wore gloves while assisting with the injection, but then removed the gloves to help the patient put on the required splint. The worker's hand was contaminated, but the worker did not realize it until returning to the hot lab after completing additional activities. As a result, the worker received an exposure of approximately 1,100 mSv to the hand, well in excess of the annual limit of 500 mSv to extremities for a nuclear energy worker.

Event 2

During the administration of a therapeutic dose of iodine-131 to a patient, the handle of the transfer cart used by the worker was inadvertently contaminated. Although the worker wore gloves during administration to the patient, the worker removed the gloves while handling the cart. Though involved in other activities involving unsealed nuclear substances, the worker did not do a hand check for several days. The nuclear energy worker received an estimated dose of 2,300 mSv to the hand, well in excess of the annual limit of 500 mSv to extremities for a nuclear energy worker.

Both events demonstrate the critical importance of following procedures and thoroughly monitoring hands for radioactivity immediately after handling nuclear substances. Washing hands does not replace the need for immediate monitoring. Periodic monitoring during extended use of unsealed nuclear substances is highly recommended. Workers must also monitor themselves for contamination at the end of each shift to ensure that all possible contamination has been detected.

If contamination of the skin is identified, immediately start decontamination procedures appropriate for the nuclear substance and notify the radiation safety officer.

For further information on managing skin contamination events, visit the [CNSC website](#).



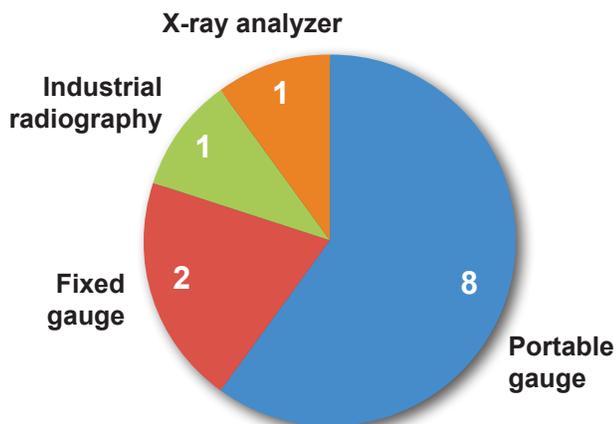
CNSC regulatory actions

To protect the health and safety of workers, the public and the environment, the CNSC issues regulatory actions to non-compliant licensees. The following enforcement actions were issued between August 1, 2016 and March 31, 2017; 13 orders and nine AMPs.

Thirteen orders were issued, primarily for inadequate radiation protection, worker training and transport of portable gauges. The breakdown of the orders issued is as follows:

- one order to a commercial-sector licensee
- 12 orders to industrial-sector licensees

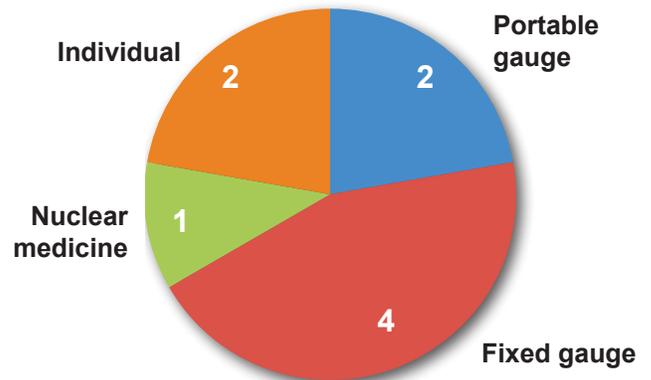
Orders issued to the industrial sector between August 1, 2016 and March 31, 2017



The breakdown of the nine administrative monetary penalties (AMPs) issued – primarily for inadequate record keeping, as well as for non-compliance with licence conditions for vessel and hopper entry – is as follows:

- one to a medical-sector licensee
- two to individuals
- six to licensees in the industrial sector:
 - of these, four to fixed gauge licensees for violation of the licence condition for vessel and hopper entry

AMPs issued between August 1, 2016 and March 31, 2017



All enforcement action details are available on the [CNSC website](#).

Orders issued August 1, 2016– March 31, 2017

Commercial sector

[Isologic Innovative Radiopharmaceuticals](#)

Industrial sector – Portable gauge

- [WSP Canada Inc.](#)
- [Arthon Industries Ltd.](#)
- [R.M. Belanger Ltd.](#)
- [Hoban Equipment Ltd.](#)
- [Dawson Construction Ltd.](#)
- [Horizon Engineering Inc.](#)
- [AM Inspection Ltd.](#)
- [Englobe Corp.](#)

Industrial sector – Fixed gauge

- [Milner Power Inc.](#)
- [Agnico-Eagle Mines Ltd.](#)

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**Industrial sector – Industrial radiography**

[Trenergy Inc.](#)

Industrial sector – X-ray analyzer

[Nfld. Recycling Ltd.](#)

**AMPs issued August 1, 2016–
March 31, 2017****Medical sector - Nuclear medicine**

[Interior Health Authority](#)

Industrial sector – Portable gauge

[R.M. Belanger Ltd.](#)

[Hoban Equipment Ltd.](#)

Industrial sector – Fixed gauge

[Milner Power Inc.](#)

[Glencore Canada Corp.](#)

[Agnico-Eagle Mines Ltd.](#)

[ArcelorMittal Canada Inc.](#)

Individuals

[Ryan Wessel](#)

[Bruno Ricignuolo](#)

May 2018: Sealed source security requirements take effect for all categories

REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*, outlines basic security measures to help prevent loss, sabotage, illegal use, illegal possession or illegal removal of sealed sources during their lifecycle. The requirements for category 1 and 2 sealed sources were implemented in 2015. The requirements for category 3, 4 and 5 sealed sources take effect on May 31, 2018. It is time to get ready.

Be sure to consult [REGDOC-2.12.3](#) for guidance on how to meet the minimum expectations for the security of sealed sources.

If you have any questions, contact your CNSC project officer or licensing specialist.