



DNSR Newsletter

Interim Exemptions from the Packaging and Transport of Nuclear Substances Regulations

In Canada, the transportation of nuclear substances is regulated by the Canadian Nuclear Safety Commission (CNSC) in collaboration with Transport Canada. The main CNSC regulations that apply are the *Packaging and Transport of Nuclear Substances Regulations* (PTNS Regulations). On February 18, 2010, two interim exemptions to the PTNS Regulations were approved by the Commission Tribunal. These exemptions were recognized in order to be consistent with the *Nuclear Substances and Radiation Devices Regulations* (NSRD Regulations) and allow for the transportation of check sources and certain radiation devices without the need to comply with the PTNS Regulations.

The first exemption applies to check sources following the sale to the end user. Check sources are sealed sources containing a small, very low-risk quantity of nuclear substances as defined in section 8.1 of the NSRD Regulations. These sources are typically used for training and instructional purposes as well as to determine if radiation detection equipment is functioning correctly. Under the NSRD Regulations, a licence to possess, transfer, store, use or abandon a check source is not required, following the sale to the end user.

The second exemption concerns radiation devices containing less than 10 times the exemption quantity (EQ) of a radioactive nuclear substance, following the sale to the end user. The EQ of a radioactive nuclear substance refers to the activity at or below which a licence to possess, transfer, import, export, store, use or abandon is not required, pursuant to the NSRD Regulations (Schedule 1 to the NSRD Regulations lists the EQs for various radioactive nuclear substances). However, radiation devices containing more than 1 time the EQ of radioactive nuclear substances are required to be certified by the CNSC for use in Canada, and this requirement will continue to be in effect.

Manufacturers and distributors are not covered under these new exemptions and will still be required to comply with PTNS Regulations with respect to the packaging and transport, since they may transport large quantities of check sources or radiation devices in one shipment.

These exemptions will not pose a risk to the environment or the health and safety of persons; will not pose a risk to national security; and will not result in a failure to achieve conformity with measures of control and international obligations to which Canada has agreed, given the low quantity of nuclear substances involved. The regulatory burden will be lessened for the users of the exempted radiation devices or check sources, by simplifying the requirements pertaining to the domestic transport of the exempted devices.

The CNSC plans to permanently incorporate these exemptions into the PTNS Regulations, as part of a future regulatory amendment. (See page 6 for contact information.)

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Overview of the Operations Inspection Division

As was explained in the first issue of the *DNSR Newsletter*, the Directorate of Nuclear Substance Regulation (DNSR) regulates the production, possession, packaging, transport and use of nuclear substances, radiation devices, Class II nuclear facilities, and prescribed equipment. It is also responsible for inspections of about 2,500 licensees across Canada.

A key part of the CNSC's regulatory approach is a compliance program that monitors licensee conformance with regulatory requirements and licence conditions. The CNSC's compliance program aims to maintain a safe nuclear sector and ensure that Canada meets its international commitments on the peaceful use of nuclear energy.

The Operations Inspection Division (OID) is one of the four Divisions that form the Directorate of Nuclear Substance Regulation. OID is responsible for verifying that licensee operations comply with the requirements of the *Nuclear Safety and Control Act*, regulations and their licences. This is no small task, since there are over 2,500 licences issued across Canada to permit the use of nuclear substances and radiation devices.

The division is made up of four regional offices based in Calgary, Mississauga, Laval and Ottawa. Currently, there are 19 inspectors and several are being trained. Henry Rabski is the Director of the division and is assisted by three coordinators: Peter Larkin (Calgary), Bill May (Mississauga) and Éric Fortier (Laval).

The compliance program, initiated by OID, focuses primarily on conducting Type II field inspections and records verification of licensed activities that present higher risks. During an inspection, the level of compliance with regulatory requirements is assessed, graded, and documented on a worksheet. At the conclusion of each inspection, the licensee is given a written report identifying any deficiencies. Within 30 days, the OID inspector sends the licensee a formal report outlining each item's assessment.

This past year, OID has begun to undertake Type I inspections. A Type I inspection is more of an audit evaluation of higher-risk applications of nuclear substances. Over the course of a typical year, this division will perform over a thousand inspections across Canada. In addition to inspections, OID investigates events involving nuclear substances and responds to concerns raised by the public.



Peter Larkin (Calgary), Bill May (Mississauga), Henry Rabski (OID Director), and Éric Fortier (Laval).

Future editions of the *DNSR Newsletter* will focus on the responsibilities of the other divisions within DNSR:

- Class II Nuclear Facilities and Equipment Division
- Nuclear Substances and Radiation Devices Licensing Division
- Transport Licensing and Strategic Support Division. 

Update on the Industrial Radiography Working Group

The Industrial Radiography Working Group has met three times since the last *DNSR Newsletter*: in Calgary in October 2009, in Ottawa in January 2010, and in Edmonton in March 2010. The group's mission is to "collaborate in the implementation of solutions in order to promote a strong radiation safety culture in the industrial radiography community while respecting and understanding the interests and expectation of stakeholders."

Henry Rabski, Director of the Operations Inspection Division in the CNSC's Directorate of Nuclear Substance Regulation, co-chairs the working group with Alan Brady, who works for TISI Canada Inc. and is President of the Canadian Industrial Radiography Safety Association.

The first topics addressed by the group were communications and regulatory compliance. Action items to improve communication between the CNSC and the radiography industry were identified and various tasks were assigned. In particular, the CNSC will be organizing meetings in Edmonton and Ottawa with radiographers this spring to discuss several topics of interest to exposure device operators and companies involved in providing radiography services. See page 6 for details of these meetings. 



Focus on the Health of Canadians

The Canadian healthcare system is continually under pressure to meet the increasing demands of a growing and aging population. The health of Canadians is always an important consideration when licensing actions are taken by DNSR, whose mandate includes the regulatory monitoring of nuclear medicine facilities, nuclear substances and the transport of nuclear substances.

There are over 700 CNSC licensees involved in some way with patient care. As a result, a number of DNSR activities continue to either directly or indirectly take the health of Canadians into account. With respect to licensing, certification, compliance and enforcement of these licensees, DNSR staff members are responsible for:

- Prioritizing work to ensure that licensing changes to patient treatment facilities are dealt with without delay and with due diligence;
- Redesigning procedures and processes to meet the urgent needs of licensees, where feasible;
- Prioritizing licence applications for nuclear substance and radiation devices, by considering the urgency level of patient care;
- Holding pre-application information sessions with applicants or licensees upon request;
- Explaining CNSC expectations and providing guidance about transport requirements;
- Coordinating outreach activities to explain CNSC expectations and to address radiation protection and other safety-related issues;
- Expediting registration of nuclear substance transfers between authorized users of the National Sealed Source Registry and the Sealed Source Tracking System;
- Enforcing the ALARA (As Low As Reasonably Achievable) principle at licensed facilities, in order to reduce radiation doses to members of the public;
- Consulting with licensee staff and planning inspection schedules, so these activities do not interfere with patient treatment hours at licensed facilities and so nuclear medicine departments remain operational while inspections are conducted; and
- Holding pre-compliance enforcement meetings with licensees to ensure that regulatory requirements and CNSC expectations are met without negatively affecting the health of Canadians.

When the licensee does not fully comply with the *Nuclear Safety and Control Act*, regulations or licence conditions, or is not responding to CNSC's requests, enforcement actions can be taken. These actions can be escalated

to the highest level if a non-compliance issue results in an immediate threat to health, safety, security or the environment. If needed, an inspector or a designated officer may issue an order to require the licensee to correct a problem, without shutting down patient treatment activities.

Within DNSR, the Director General is responsible for the overall administration of licensing, certification, compliance, and enforcement activities, and ensures that DNSR staff always consider the health of Canadians. Each DNSR director is responsible for ensuring that procedures and processes are in place and that their staff follow them. 

Keeping Doses “As Low As Reasonably Achievable”

DNSR inspectors enforce a concept known as the ALARA principle, in order to minimize radiation doses to workers and members of the public and to maintain DNSR's commitment to protect the health of Canadians.

“ALARA” stands for “As Low As Reasonably Achievable” (social and economic factors being taken into account). This concept is not new: For many years, it has been incorporated as radiation dose limits in the recommendations of the International Commission of Radiological Protection (ICRP). The *Radiation Protection Regulations* extend the ALARA concept as a requirement to all licensees, and the CNSC seeks explicit demonstration of compliance.

The above regulations require licensees to implement measures to keep doses received by workers and members of the public as low as reasonably achievable. It is not enough for a licensee to simply respect the appropriate dose limits — efforts must be made to further reduce doses. A licensee's senior management is expected to be committed to maintaining doses ALARA and to take appropriate measures to reduce doses where practical.

The Canadian Nuclear Safety Commission has a guidance document titled, *G-129, Rev.1, Keeping Radiation Exposures and Doses “As Low As Reasonably Achievable (ALARA)”*, which is available at nuclearsafety.gc.ca. The purpose of this document is to help persons regulated by the CNSC to correctly use the ALARA principle when designing and implementing a radiation protection program. To request paper copies of this publication, contact the CNSC at info@cnsccsn.gc.ca. 



Orphan Sources in Canada

A radioactive source that is not under proper regulatory control is said to be an “orphan source.” These uncovered radioactive sources may never have been subject to regulation because they were exempted from regulation or may have been regulated initially before being abandoned, lost, misplaced, stolen, or removed without proper authorization. Some sources may not be formally “orphaned” but their control may not be appropriate, so they are vulnerable to being mishandled or lost.

Industrial devices containing radioactive sources fall out of regulatory control through theft, loss during transport, or inadvertent or intentional abandonment. These devices may then be subject to harsh conditions that could expose the radioactive source and subsequently may enter the public domain via contaminated recycled metal products or other means. There are many locations in Canada that are equipped with radiation detection instruments where vehicles are monitored for the presence of radioactive material. These locations are primarily at waste depots, municipal transfer stations and scrap metal recycling companies.

In Canada, steel-making and foundry industries rely on radiation-free scrap from manufacturing operations and recycled products. Most steel recycling facilities are not

CNSC licensees. In order to protect their end products, they use radiation detection portal monitors to detect the presence of radioactive materials coming onto their property. However, by doing so they may inadvertently come into the possession of orphaned sources. As non-licensees, these facilities likely have had no previous contact with the CNSC and consequently are not aware of their regulatory obligations under the *Nuclear Safety and Control Act* and regulations.

Hazards to workers, the public, and the environment can be prevented or reduced by managing these materials correctly. Workers and persons who are likely to encounter orphan sources during the course of their operations, such as scrap metal dealers, Canada customs locations and waste management facilities, are encouraged to implement appropriate monitoring programs to detect these sources.

The CNSC is currently developing a poster and pamphlet containing guidelines on the use of radiation portal monitors and how to respond to alarms. Further information or assistance with the development of a monitoring program may be obtained from the CNSC’s Directorate of Nuclear Substance Regulation. (See page 6 for contact information.) 

International Spotlight on Transportation

The transport of nuclear substances or radioactive material is an essential activity worldwide, so transport safety and security are matters of international importance. At the International Atomic Energy Agency (IAEA), the review and revision of safety standards and guidance documents for the safe transport of radioactive material are high-priority items.

The IAEA aims to achieve international consensus on the development and revision of standards for the safe transport of radioactive material. To this end, the IAEA created the Transport Safety Standards Committee (TRANSSC), a standing body of senior experts from Member States, which meets twice a year, with each meeting lasting up to five days. André Régimbald, Director General of the Canadian Nuclear Safety Commission’s Directorate of Nuclear Substance Regulation, is a full member of TRANSSC.

TRANSSC advises the IAEA’s Deputy Director General, Head of the Department of Nuclear Safety and Security, on the development, review and revision of standards related to the safe transport of radioactive material. TRANSSC’s objective is to ensure a broad international input on the review and revision of standards by collecting comments

and suggestions from Member States. By bringing Member States together, TRANSSC aims to achieve not only consensus, but quality, coherence and consistency in the development of standards.

Other TRANSSC responsibilities include:

- updating the *Advisory Material for the Safe Transport of Radioactive Material*;
- publishing a safety standard on *Compliance Assurance in the Transport of Radioactive Material*;
- developing guidance on the control of contamination in the transport of radioactive material;
- revising and updating guidance on planning and preparing for emergencies in the transport of radioactive material;
- to ensure a broad international input in the preparation and review of transport safety standards; and
- to advise on transport safety standards, relevant regulatory issues and activities for supporting the use and application of the Agency’s safety standards.

TRANSSC meets twice a year at the IAEA headquarters in Vienna. The last meetings were held in June and October 2009 and its next meeting is scheduled for June 2010. 



Orders Issued

The *Nuclear Safety and Control Act* authorizes the Commission Tribunal of the CNSC, its designated officers and inspectors to issue orders to CNSC licensees. They may order a licensee to take any measure considered necessary to protect the environment, the health or safety of persons, or to maintain national security or compliance with international obligations to which Canada has agreed.

Since June 2009, DNSR staff have issued orders to the following licensees:

- Canadian Sub-Surface Energy Services Inc.
- Sun Wave Forest Products Ltd.
- Hafner Inc.
- Campo Verde Contracting Ltd.
- Acuren Group Inc.
- Nomad Inspections Services Ltd.

Canadian Sub-Surface Energy Services Inc., an oil well logging company, reported on August 13, 2009, that one of its nuclear energy workers had been accidentally exposed to a radioactive source. Upon further investigation by the CNSC, it was determined that the company was also using improper handling, packaging, and transportation techniques for its radioactive sealed sources. On August 31, 2009, an Order was issued by a CNSC Designated Officer for the company to cease operation, conduct an inventory of the nuclear substances in its possession or under its care and control, and to refrain from transporting, transferring or importing nuclear substances.

Following a presentation by Canadian Sub-Surface Energy Services Inc. at the Commission Tribunal hearing of October 21, 2009, and a subsequent follow-up inspection by CNSC staff, the Tribunal was satisfied with the initial corrective measures taken by the licensee and revoked the Order on November 30. In doing so, it requested that the company provide CNSC staff with an update on all outstanding action items. The Tribunal also asked staff to inform the Commission Secretary on the status of the action items by March 31, 2010.

On September 21, 2009, a CNSC inspector issued an Order to **Sun Wave Forest Products Ltd.** to remove all of its 37 fixed radiation devices and to transfer them to a secure location or to an authorized recipient by September 30, 2009. The company is the Canadian subsidiary of the China Paper Group Corp., owner of the Prince Rupert Pulp mill situated on Watson Island about 770 km north of Vancouver, British Columbia. Sun Wave failed to comply with the Order and effective October 27, 2009, the City of Prince Rupert applied and received a CNSC licence to possess the radiation devices. The City has taken possession of the property as a result of the company's failure to pay its municipal taxes.

In a CNSC inspection on September 10, 2009, at **Hafner Inc.** of Granby, Quebec, it was discovered that the company was in unauthorized possession of two radiation devices. A subsequent inspector Order was issued requiring the company to transfer both devices to a CNSC licensee. The company responded in a timely fashion and the order was subsequently revoked.

Campo Verde Contracting Ltd. of Vanderhoof, B.C. was inspected by CNSC inspectors at work sites in October 2009. During these inspections, 13 items of non-compliance were cited related to training, radiation protection and transportation requirements. Campo Verde was ordered on October 23, 2009, to cease use, and not transfer or transport any of the radiation devices until the CNSC has verified that the company has carried out corrective actions. As of April 2010, the Order remained in place.

In an unannounced field inspection of an **Acuren Group Inc.** radiography crew on January 13, 2010, an inspector discovered a significant failure in the systems put in place by Acuren to protect the health and safety of workers and the public. Two certified exposure device operators were ordered to be removed from radiography operations until the company could show that:

- A survey meter is being used.
- Appropriate warning signs are posted.
- Emergency contact information is posted.
- A person or barrier is placed at the safe boundary.
- Appropriate shipping documents are available.
- Transportation of Dangerous Goods certification is available.
- Personal dosimeters are used by all exposure device operators.

Acuren has since complied with the Order.

On January 29, 2010, an inspector conducted an unannounced field inspection of exposure device operations being conducted by Alberta-based **Nomad Inspections Services Ltd.**, operating north of Tomslake, B.C. The inspector uncovered that:

- The operator was not using a survey meter to confirm the safe return of the radioactive source.
- Pre-operation checks were not adequately performed by the operator.
- The operator had incorrectly recorded his start dose as 0.0 μSv (0.0 mR).
- The vehicle alarm was not functioning properly.

Nomad was ordered to remove the operator from using an exposure device until it can demonstrate, to the satisfaction of the CNSC, that the worker no longer presents a risk to health and safety. The company complied with the Order. 

Exposure Device Incidents Reported

In February 2009 and March 2010, the Canadian Nuclear Safety Commission (CNSC) received incident reports about the source assembly used in MDS Nordion Gammamat TSI 5/1 exposure devices. In both incidents, users reported that the female connector on the source assembly had broken in half.

No person received an increased radiation dose due to these connector failures, because the source assemblies were in the fully shielded position when the breaks were observed. Following the incidents, licensees surveyed the devices and found radiation levels below 2 mSv/h, which is within normal range for this type of exposure device. Licensees did not attempt to remove the sources from the exposure devices, which were sent to the manufacturer (MDS Nordion) for servicing and repair.

MDS Nordion is investigating these incidents and has been instructed by the CNSC to provide a root cause analysis as soon as possible.

Minor Change to SSTS Procedures

Licensees who are authorized users of the Sealed Source Tracking System (SSTS) will now receive an email from the CNSC on the day of the planned export, in order to request confirmation that the source has been exported. ✎

Should similar incidents occur, licensees are reminded that they should inform the device manufacturer and notify the CNSC pursuant to section 38 of the *Nuclear Substances and Radiation Devices Regulations*. ✎



Two incidents involving the source assembly in MDS Nordion Gammamat TSI 5/1 exposure devices were reported to the CNSC. In each case, the female connector on the source assembly broke in half while the source assembly was in the fully shielded position.

CNSC Industrial Radiography Meetings Announced

As part of the Industrial Radiography Working Group that involves the CNSC and industry representatives, one-day meetings are planned for both Western and Eastern Canada. These meetings will update individuals involved in industrial radiography about current initiatives, in order to address issues of concern to the industry.

Western Canada — May 27, 2010, Edmonton, Alberta
Eastern Canada — June 15, 2010, Ottawa, Ontario

To register or to get more information, contact Tammy Madsen of the CNSC
Telephone: 403-292-5181
Email: Tammy.Madsen@cnsccsn.gc.ca

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The *DNSR Newsletter* is a CNSC publication. If you have any suggestions on topics or issues that you would like to see covered, please do not hesitate to contact us.

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