



Canadian Nuclear  
Safety Commission

Commission canadienne  
de sûreté nucléaire

# SPOTLIGHT ON NUCLEAR SAFETY



CANADIAN NUCLEAR SAFETY COMMISSION  
ANNUAL REPORT  
2013–14



Canada 

The Canadian Nuclear Safety Commission regulates all nuclear facilities and activities in Canada – from uranium mining to power generation, nuclear research, nuclear facilities and prescribed equipment, industrial and medical applications of nuclear materials, and waste disposal.

We strive to ensure that Canadian nuclear activities are among the safest and most secure in the world.

As leaders in our field, we are experts with a strong focus on action: We enforce our very strict regulatory requirements and vigilantly monitor licensees to verify they are following the rules.

We regulate the nuclear industry in Canada to keep Canada and Canadians safe.



# LETTER TO THE MINISTER

**The Honourable Greg Rickford**  
**Minister of Natural Resources**  
**Ottawa, Ontario**

Sir:

I have the honour of presenting to you the Annual Report of the Canadian Nuclear Safety Commission for the fiscal year ending March 31, 2014. The report has been prepared and is submitted in accordance with Section 72 of the *Nuclear Safety and Control Act*.



**Michael Binder**

President and Chief Executive Officer,  
Canadian Nuclear Safety Commission

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# MESSAGE FROM THE PRESIDENT

It is my honour and great pleasure to present the Canadian Nuclear Safety Commission (CNSC) Annual Report for 2013–14. This is my seventh annual report since becoming CNSC President in 2008. This year, we chose the title “Spotlight on Nuclear Safety” to focus attention on our ongoing work, and our continuing efforts to improve our performance results to ensure a safe nuclear sector in Canada that protects both people and the environment.



We continue to implement the action plan created in response to the *Fukushima Task Force Report*, with the aim of completing all generic action items by 2015. Several new regulatory documents, which further clarify regulatory expectations on post-Fukushima requirements, were published.

In 2012, the Parliament of Canada amended the *Nuclear Safety and Control Act* and provided the CNSC with the authority to create an administrative monetary penalties system. This past year, the regulations for this system came into force and the CNSC issued its first penalties. Licensees are being provided with guidance to better understand how the CNSC will use this new tool within its graduated enforcement system.

The Commission held several public hearings this past year and heard from many Canadians who wished to express their views. The licence hearings covered a full range of nuclear facilities, including uranium mines, nuclear power plants and nuclear research reactors. The CNSC continued to reach out to Canadians through many activities. Commission public hearings were held in Saskatoon and La Ronge, Saskatchewan; and in Clarington and Toronto, Ontario. Participant funding was offered to enhance participation in Commission hearings for major nuclear facilities. Presentations as part of CNSC 101 (an outreach program that travels to select locations), as well as open houses were held in communities across Canada. Social media has also become a mainstay in our efforts to keep the public informed about our work.

A great deal of work this year has been devoted to the Deep Geologic Repository project for low- and intermediate-level radioactive waste, proposed by Ontario Power Generation for the Kincardine, Ontario area. CNSC staff have been providing technical support and research assistance to the independent joint review panel that will prepare an environmental assessment report for the Minister of the Environment, who will make the decision if the project can proceed.

Work has also continued on other major long-term projects such as the relicensing of the Pickering, Darlington and Bruce nuclear power plants, and the decommissioning of the Gentilly-2 nuclear power plant; the project proposed by the Nuclear Waste Management Organization for a deep geologic repository for used nuclear fuel; and the pre-licensing reviews of nuclear reactor designs.

The CNSC continues to invest efforts in long-term planning and will be ready to regulate the changing nuclear industry.

Our work, both domestically and internationally, is always focused on our primary commitment to Canadians: that we will never compromise safety.

  
Michael Binder

# CANADIAN NUCLEAR SAFETY COMMISSION — OVERVIEW

## VISION

To be the best nuclear regulator in the world

## MISSION

The Canadian Nuclear Safety Commission regulates the use of nuclear energy and materials to protect health, safety, security and the environment, and to implement Canada's international commitments on the peaceful use of nuclear energy; and to disseminate objective scientific, technical and regulatory information to the public.



The CNSC's headquarters are in Ottawa and we have offices at each of Canada's five power reactor sites, a site office at Chalk River Laboratories and four regional offices across the country.



## A REGULATORY AND OVERSIGHT ROLE

Under the *Nuclear Safety and Control Act* (NSCA), the Canadian Nuclear Safety Commission (CNSC) regulates and establishes technical requirements for all nuclear-related activities in Canada. Those wishing to carry out activities regulated under the NSCA – including activities related to the construction, operation, decommissioning and abandonment of nuclear facilities, prescribed equipment, the production, possession and use of nuclear substances, as well as their export and import – must first obtain a licence from the CNSC. We provide clarity on regulatory expectations, and we oversee licensed activities to ensure our regulatory requirements are met.

The Commission is the CNSC's decision-making body and makes licensing decisions for all major nuclear facilities in Canada.

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Our staff participate in many national and international technical projects and meetings to contribute to the safe and secure regulation of nuclear facilities and activities here in Canada and around the world. These projects and meetings address areas ranging from the design of new nuclear reactors, aging facilities and decommissioning practices to the effects of radiation on people and the environment, and nuclear non-proliferation activities.

To ensure accountability and effective stewardship of resources, the CNSC has a Management Committee as well as two oversight committees. The CNSC's Audit Committee (with three external and two internal members) reinforces the effectiveness of internal audits. It oversees key areas and processes such as risk management, management control, accountability reporting, and values and ethics. The CNSC's Evaluation Committee, whose members come from the management cadre, is also an essential component of the organization's governance structure. It serves as an advisory body to the President on the CNSC's evaluation plan and final evaluation reports.

## A MANDATE TO ENSURE SAFETY

The CNSC uses risk-informed regulatory approaches to plan and carry out licensing and compliance activities, in order to establish appropriate regulatory control that is commensurate with the activities and the risk involved.

All major Canadian nuclear facilities are designed and operated with the "defence-in-depth" principle in mind. The CNSC requires licensees to implement multiple layers of defence in safety systems and programs, in order to keep facilities and workers safe and to minimize consequences should a severe accident happen.

The CNSC's strict oversight, which includes onsite inspections, ensures licensees are operating safely and adhering to their licence conditions.

## A FOCUS ON SAFETY AND PREPAREDNESS

The CNSC makes safety its number-one priority, and it requires licensees to do the same. This includes being prepared to respond to events and emergencies, as well as continually evaluating and improving emergency response capabilities.

Canadian regulations require all licensees to demonstrate to the CNSC that their workers are fully trained to carry out their duties competently, and that they have comprehensive emergency programs in place to mitigate any events and their potential consequences. The CNSC works with nuclear operators, federal and provincial government agencies, municipalities, first responders and international organizations, to be ready to respond to a nuclear emergency at any time.

## FOSTERING AN INTERNAL SAFETY CULTURE

The CNSC is striving to foster a healthy safety culture, as derived from its organizational mission, programs and practices, along with employee and management actions and behaviours, which establish safety as an overriding priority. For the CNSC, this means embedding safety into everything we do and having the same focus on safety that we expect from our licensees.

# KEY ACHIEVEMENTS THE YEAR IN REVIEW



The 2013–14 operating year at the Canadian Nuclear Safety Commission (CNSC) has been one of managing and implementing many changes that have taken place, not only in the past year, but since the tragic Fukushima Daiichi accident in 2011. The regulations to strengthen our compliance/penalty regime were published this past year. We have updated many of our regulatory guidance instruments to reflect the lessons learned from Fukushima. The Commission has been very active in the licensing and re-licensing of many major nuclear facilities, including most of Canada’s uranium mines and mills.





# REGULATORY CHANGES

## *Administrative Monetary Penalties Regulations*

The CNSC's *Administrative Monetary Penalties Regulations* came into force on July 3, 2013, with their publication in the *Canada Gazette Part II*, following changes made in 2012 to the *Nuclear Safety and Control Act* (NSCA), which called for the CNSC to develop and implement administrative monetary penalties (AMPs). To complement the *Administrative Monetary Penalties Regulations*, the CNSC published REGDOC-3.5.2, *Compliance and Enforcement: Administrative Monetary Penalties*. The document provides an overview of how and where AMPs fit into the CNSC's approach to graduated enforcement, and describes how penalty amounts are calculated.

## **New Regulatory Documents Focus on Post-Fukushima Requirements and Security**

In 2013–14, the CNSC published seven regulatory documents (REGDOCs), clarifying requirements in the areas of accident management, aging management, security, and compliance and enforcement.

Three of these publications enhance CNSC requirements and guidance in the area of nuclear security: REGDOC-2.12.1, *High-Security Sites: Nuclear Response Force*; REGDOC-2.12.2, *Site Access Security Clearance*; and REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*.

In addition, two publications represent an important element of the CNSC's response to Fukushima Task Force recommendations, modernizing regulatory expectations. They included: REGDOC-2.3.2, *Accident Management: Severe Accident Management Programs for Nuclear Reactors*, and REGDOC-2.9.1, *Environmental Protection: Policies, Programs and Procedures*.

## LICENSING MAJOR NUCLEAR FACILITIES

During 2013–14, the Commission held 10 public hearings with a total of 271 intervenors, and conducted 10 abridged hearings.

- April 2013, public hearings in Saskatoon, Saskatchewan concerning the renewal of the Beaverlodge and Cigar Lake operating licences, with decisions by the Commission to renew these licences on May 27 and June 13, 2013, respectively.
- May 2013, public hearings on the licence renewal for SLOWPOKE research reactors at École Polytechnique, University of Alberta, Royal Military College and Saskatchewan Research Council. On June 26, 2013, the Commission issued its decisions to renew the operating licences for these facilities.
- May 2013, public hearing in May in Clarington, Ontario on the renewal of the Pickering Nuclear Generating Station operating licence, with a decision by the Commission, with hold points, to renew this licence on August 9, 2013.
- October 2013, public hearings in La Ronge, Saskatchewan, on the renewal of the operating licences for the McArthur River, Rabbit Lake and Key Lake uranium mines and mills. The Commission issued its decisions to renew these licences on January 7, 2014.

## Abridged Hearings

The Commission also conducted 10 abridged hearings this past year on various matters. Abridged hearings deal with low-risk administrative licensing issues. All of the abridged hearings are described in more detail in Annex A – Commission Hearings and Opportunities To Be Heard.

## Public Commission Meetings

- August 2013, the Commission conducted a public meeting with participation from the public on the *CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants for 2012*.
- In December 2013, as a community outreach effort, the Commission conducted a public meeting

in downtown Toronto, with participation from the public on the *CNSC Staff Report on the Performance of Canadian Uranium Fuel Cycle and Processing Facilities*, with a focus on the GE-Hitachi nuclear facilities in Toronto and Peterborough.

## OTHER LICENSING ACTIVITIES

In accordance with requirements defined in the *Nuclear Non-Proliferation Import and Export Control Regulations*, 492 export licences and 157 import licences were issued for nuclear substances, prescribed equipment and prescribed information. An additional 212 export licences were issued for risk-significant radioactive sources, in accordance with the *General Nuclear Safety and Control Regulations*. During 2013–14, the CNSC issued 163 new transport licences, revised 66 transport licences and issued 19 transport certificates for package design and for special-form radioactive material. The CNSC also issued 31 new certificates and revised 65 certificates for radiation devices and other prescribed equipment in 2013–14. Service standards for the processing and assessment of applications for export and import of nuclear substances, prescribed equipment and prescribed information were published by the CNSC in July of 2013. Additional information and performance standards and indicators on high-volume licensing activities can be found on the CNSC website.

Key safety-related positions at nuclear facilities and facilities that use nuclear-related equipment must be occupied by personnel who have been certified by the CNSC as qualified, trained and capable of performing their duties. These include key operating personnel for both power and research reactors; health physicists and radiation safety officers; and exposure device operators (operators of industrial radiography equipment). As of March 31, 2014, there were 2,714 valid CNSC certificates held by persons across Canada.

To support a new CNSC regulatory requirement which will require the recertification of exposure device operators every five years, the CNSC's certified candidate database has been reviewed extensively to identify how many certified candidates are still active. As a

result of this initiative, the total number of valid CNSC certifications has dropped considerably from last year's total. The new reported data provides a better reflection of the CNSC-certified workforce. These changes are part of the CNSC's ongoing program to improve the safety of industrial radiography in Canada and are driven by our commitment for continuous improvement and enhanced regulatory effectiveness.

## COMPLIANCE VERIFICATION AND ENFORCEMENT

In 2013–14, the CNSC carried out 1,778 Type I and Type II inspections and 4,698 Desktop Reviews and Annual Compliance Report verifications, relative to over 2,700 licences held by almost 1,800 licensees.

In terms of regulatory actions, 18 orders were issued to specific licensees using nuclear substances. These orders typically required the licensee to cease using a nuclear-related device or activities until it had complied with CNSC requirements.

### Administrative Monetary Penalties

Three administrative monetary penalties (AMPs) were issued in 2013–14 for various violations of regulatory requirements. These were the first AMPs issued under the new *Administrative Monetary Penalties Regulations*, which came into force in July 2013.

## REGULATORY REFORM

### Responsible Resource Development

In December 2013, Fisheries and Oceans Canada (DFO) and the CNSC signed a Memorandum of Understanding (MOU) outlining areas for cooperation in the administration of the *Fisheries Act*. Under the MOU, the CNSC has been designated as the responsible authority for the assessment and monitoring of environmental impacts on fish, including species listed in the *Species at Risk Act* (SARA), and to make recommendations to DFO related to authorizations under the *Fisheries Act*.

## Cabinet Directive on Regulatory Management (CDRM)

As a responsible federal regulator, the CNSC implements the *Cabinet Directive on Regulatory Management* (CDRM). The CNSC has developed its policy analysis capacity to meet the requirements of the CDRM and ensure that regulatory issues are adequately analyzed early, are well defined, and that the choice of regulatory approach is the most appropriate under the circumstances. The CNSC has developed an approach to early consideration of the impacts of its regulatory initiatives on licensees. The Cost Benefit Analysis Project was launched to develop regulatory guidance that will clarify the manner in which the CNSC considers cost benefit analysis while assessing licensing and compliance options. Stakeholders will have an opportunity to provide input on this matter throughout the process.

## DARLINGTON NEW NUCLEAR PROJECT UPDATE

In December 2013, the Government of Ontario released its long-term energy plan. The plan indicated that building new nuclear capacity at Darlington would be deferred due to lower than forecasted electricity demand. However, the provincial government also indicated that it intended to work with Ontario Power Generation (OPG) to maintain the power reactor site licence issued in August 2012.

The joint review panel environmental assessment findings and the decision to issue a licence to prepare site were legally challenged by several environmental groups and in May 2014, the Federal Court ruled that three specific points in the assessment should be returned to the panel for further consideration. The matter is currently under appeal.



## PROPOSED DEEP GEOLOGIC REPOSITORY PROJECT FOR LOW- AND INTERMEDIATE-LEVEL WASTE

Ontario Power Generation is proposing a deep geologic repository (DGR) for low- and intermediate-level radioactive waste, which would be stored in a deep rock vault of clay-rich limestone over 600 metres below ground. The DGR is designed to be a long-term management facility for OPG's low- and intermediate level radioactive waste. An independent joint review panel (JRP), appointed by the Minister of the Environment and the CNSC President early in 2012, is examining the proponent's licence application for the first phase, and the environmental assessment information for all phases of the project.

During this past year and throughout the course of the public hearings in 2013, there were 25 days of public hearings, with 285 Commission Member Documents submitted and 160 intervenors appearing before the panel. CNSC staff reviewed OPG's environmental impact statement, technical documentation, interventions and has provided technical and research assistance responses to requests from the JRP. CNSC staff also appeared in front of the panel and made presentations and responded to a broad range of questions from the JRP, and will continue to participate in additional hearings to be held in September 2014.

## PRE-LICENSING REVIEW PROCESS – A TOOL FOR VENDORS TO GAUGE THEIR READINESS

In 2013–14, the CNSC continued to provide optional pre-licensing reviews for nuclear reactor vendors. A pre-licensing review is a service that takes place at the vendor's request. The goal is to provide the vendor with early feedback, in a number of technical and cross-cutting areas, about possible fundamental barriers to licensing that may exist for their design in Canada. The process also allows the vendor to provide assurance that resolution paths exist for any design issues identified in the review. This information can be used by the vendor to have discussions with utilities and their decision-makers (who are evaluating designs for possible deployment). A pre-licensing review does not involve issuing a licence or a certification under the NSCA. Moreover, it does not in any way bind or influence future decisions by the Commission, which has the authority to issue licences for reactor facilities.

In 2013, CNSC staff completed:

- a Phase 3 review of the Candu Energy Inc. Enhanced Candu 6 (EC6) design
- a Phase 2 review of the Westinghouse Electric Company AP1000 design
- a Phase 1 review of the ATMEA ATMEA1 design

Executive summaries of the three pre-licensing vendor design reviews can be found on the CNSC website.

Also in 2013, there was an increase in on the part of vendors of small modular reactor (SMR) technologies for potential deployment opportunities in Canada. This interest has arisen from regions with smaller grids which cannot site a large-scale nuclear power plant, and from regions with limited or no grids and limited means to generate power economically. CNSC staff provided these vendors with an overview of the CNSC pre-licensing vendor design and licensing review processes. Depending on the market potential, the CNSC may receive an application for a vendor design review for one or more SMRs in the coming years.

## RESEARCH AND SUPPORT PROGRAM – LEARNING FROM FUKUSHIMA

The CNSC's Research and Support Program generates knowledge and information to assist the CNSC in its regulatory activities focused on the Canadian nuclear industry. The program provides access to independent advice, expertise, experience and information through contracts, grants and contributions placed in the private sector or with other national or international agencies and organizations.

In 2013–14, the Research and Support Program spent \$2.75 million on 35 projects, 25 contributions and 8 grants — up from \$2.53 million in 2012–13. Most research projects are undertaken over the course of multiple years; during this year, 13 of the 35 projects were completed. As part of ongoing efforts to improve the dissemination of scientific and technical information related to the CNSC's regulatory mandate, these research reports are available through the CNSC website (except where confidential for security reasons). The CNSC's research also contributed to the significant efforts made by CNSC staff to further the understanding of regulatory science: CNSC staff prepared 25 technical papers and 4 peer-reviewed journal articles over the last year, such as the *Radiation and Incidence of Cancer Around Ontario Nuclear Power Plants from 1990 to 2008 (The RADICON Study) Summary Report*. Details of the CNSC's research efforts are in a recently published report, *The Science of Safety, CNSC Research Report 2012–14*, which is available on the CNSC website.

The CNSC remains strongly committed to supporting the International Atomic Energy Agency (IAEA) in its investigations and efforts to learn from the Fukushima Daiichi accident. During the past year, the CNSC provided a substantial contribution in support of the IAEA's *Comprehensive Report on the Fukushima Daiichi Accident*. Another achievement was the use of the Digital Cerenkov Viewing Device (developed in Canada with support from the CNSC) by the IAEA at Fukushima. Canadian specialists trained IAEA inspectors to use this device to help speed up the transfer of spent fuel from Fukushima's general spent fuel pond to dry storage.



## SPOTLIGHT STORY

# Building a Rapport With Canadians



The *Nuclear Safety and Control Act* mandates the Canadian Nuclear Safety Commission (CNSC) to undertake many tasks for the benefit of Canadians. One of them is to provide the public with objective scientific, technical and regulatory information about nuclear activities and the activities of the CNSC.

The CNSC reaches out through a wide variety of programs and activities. One example is the Participant Funding Program (PFP), established in 2011, which continues to provide financial support to interested members of the public to encourage participation at Commission hearings for major nuclear facilities. In 2013–2014, the CNSC's Participant Funding Program

awarded close to \$290,000 to Aboriginal groups and individuals in support of their participation in Commission proceedings.

Another example is the CNSC's practice of informing and consulting with Aboriginal groups about ongoing and upcoming projects. In 2013–14, outreach activities with dozens of Aboriginal groups in relation to CNSC regulated activities were carried out. Over 20 First Nation and Métis groups participated in Commission public hearings, including the proceedings for the Deep Geologic Repository project, the Pickering licence renewal, and the renewal of licences for uranium mine and mill operating facilities in northern





**Members of the public visiting the new training facility built for the refurbishment of Darlington Nuclear Generating Station operated by Ontario Power Generation (Clarington, Ontario)**

Saskatchewan. The CNSC also continued to share information with Aboriginal peoples on its regulated activities through numerous means such as outreach events, community meetings, technical workshops, site visits and open houses.

A new website (launched in February 2014), a new video series, as well as a renewed emphasis on social media, represent more examples of tools used by the CNSC to provide Canadians with the information they seek about nuclear-related activities.

## IMPROVING PUBLIC UNDERSTANDING OF WHAT WE REGULATE

The CNSC strives to produce, or make accessible, credible scientific and technical information that the public can easily understand. A plain language policy has been in place since 2006 and plays a key role in this initiative.

One key activity that helps people better understand the CNSC is “CNSC 101”, an outreach program that travels to locations across Canada, delivering sessions on the CNSC’s role as Canada’s nuclear regulator. Audiences

include non-governmental organizations, academia, government staff, CNSC licensees, Aboriginal groups and the general public. In 2013–14, CNSC 101 was offered in 16 locations to more than 500 participants.

## LICENSEES MUST BE OPEN, TRANSPARENT AND RESPONSIVE

CNSC licensees or major facilities are expected to take the lead on providing timely and relevant information to the public. Regulatory document RD/GD 99.3, *Public Information and Disclosure*, requires licensees and licence applicants to develop information programs that disclose and explain their plans and activities to the public. Moreover, the CNSC directs licensees to tailor their information programs to their target audiences (usually those who live near nuclear facilities), in particular revealing information related to the health, safety and security of people and the environment.

# SAFE URANIUM MINES AND MILLS



## A natural resource as nuclear fuel

The Canadian Nuclear Safety Commission (CNSC) ensures that the health of workers, local residents and the surrounding environment at uranium mine and mill sites are protected.



## SAFETY SUMMED UP

- Personal dose records for operating mines and mills from 2007 to 2013 show that radiation doses to workers were at safe levels and well below regulatory limits.
  - The number of reportable events has remained stable at Canada's uranium mines and mills over the past several years (21 events in 2011, 20 in 2012 and 18 in 2013).
  - In 2013–14, effluent discharges to the environment from uranium mining were within regulatory limits.
  - The public and country food in the Athabasca basin continue to be protected.
- 

Canada is the world's second-largest uranium producer, and 85 percent of Canada's uranium production is exported. Uranium mining creates about 5,000 direct jobs in Canada. Raw ore from uranium mines is processed at a milling facility to extract uranium, and the uranium concentrate is then further processed to create fuel for nuclear power reactors.

The CNSC conducts inspections every year at Canada's uranium mines and mills. These inspections confirm that radiation levels are kept well below regulatory limits by the licensee, that workers and the public are protected from other potential hazards, and that all activities are environmentally safe. The handling and transport of uranium in Canada are also regulated by the CNSC. CNSC inspectors work closely with provincial inspectors from the Saskatchewan ministries of labour and the environment to monitor licensees' occupational

health and safety programs, including those for radiation protection. Licensees are required to notify the CNSC of events or situations outside normal operations, and the CNSC follows up to ensure the licensee has a plan in place to prevent such events from recurring.

In 2013–14, the CNSC renewed the licences for all of Cameco's uranium mines and mills (Key Lake, Rabbit Lake and McArthur River), in northern Saskatchewan. In addition, Cameco's Cigar Lake mine, also in northern Saskatchewan, was issued its first operating licence.

The CNSC continued to review applications from companies that have expressed interest in establishing new uranium projects: AREVA Resources Canada for its Kiggavik mine project (Nunavut); and Cameco Corporation for the Millennium mine project (Saskatchewan).



# SAFE NUCLEAR PROCESSING AND RESEARCH



*An important part of Canada's nuclear sector*

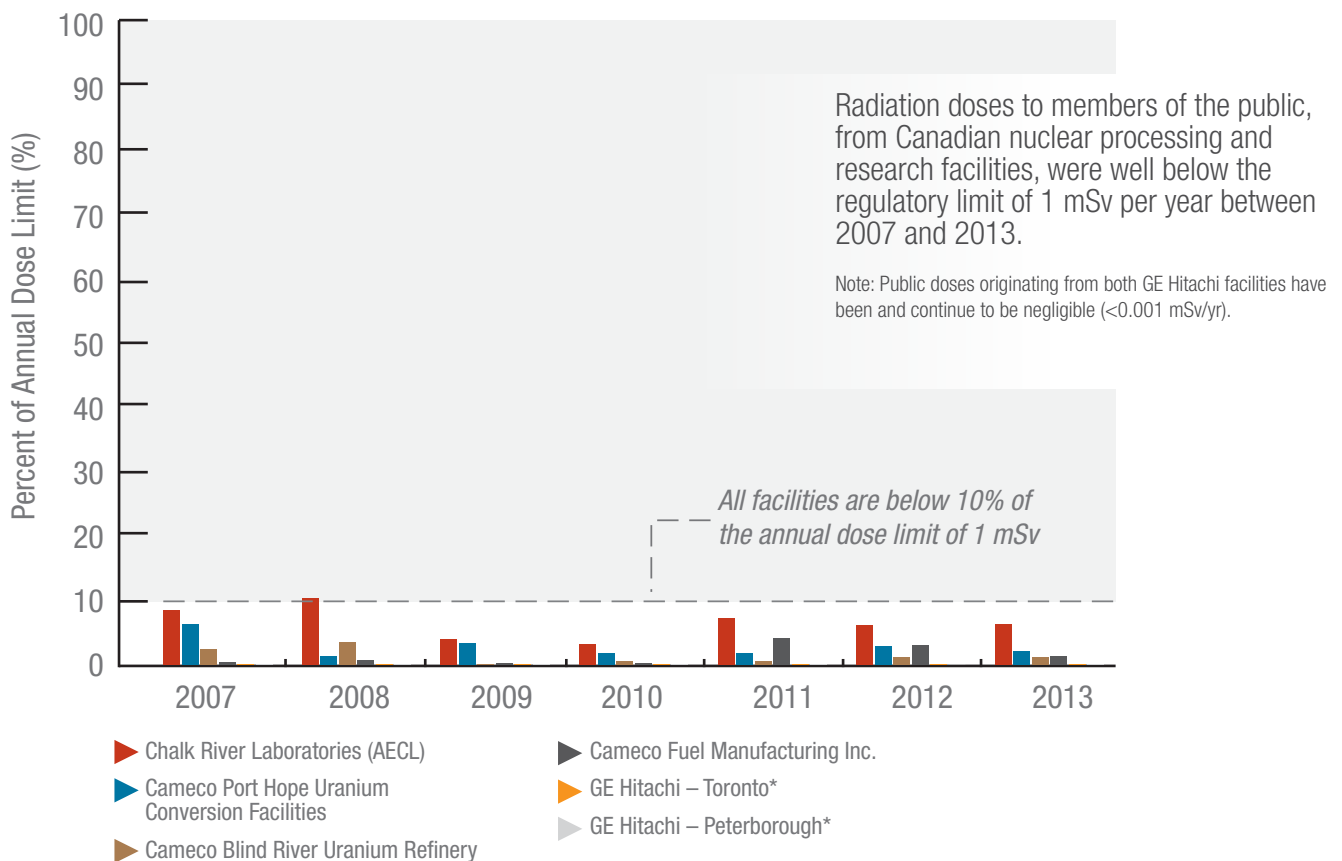
Uranium processing plants and research facilities that use nuclear energy are carefully regulated and licensed by the Canadian Nuclear Safety Commission (CNSC) to protect Canadians and the environment.



# SAFETY SUMMED UP

- In 2013–14, there were no events with consequences to public health or the environment.
- Radiation doses to the public continued to be well below regulatory limits.

**FIGURE 1**





The CNSC oversees nuclear processing and research facilities, to protect people who live and work near them, and to protect the surrounding environment. From uranium processing facilities to research reactors and accelerators, nuclear-related processing and research play an important role in Canadians' lives. For example, research reactors and accelerators are used in scientific research and training, for testing materials, and to produce radioisotopes for medical procedures.

## GE HITACHI NUCLEAR ENERGY CANADA INC.

In December 2013, the Commission held a public meeting in Toronto to discuss the performance of the Toronto facility operated by GE Hitachi Nuclear Energy Canada Inc. While the facility continues to be operated safely, with no impact on the environment (as determined by a soil monitoring analysis conducted by both the CNSC and the Ontario Ministry of Environment), the Commission has indicated that the licensee needs to continue to strengthen its public information and disclosure program.

## BLIND RIVER REFINERY

Cameco's Blind River Refinery (BRR) has completed the corrective actions resulting from the June 2012 incident when three workers were exposed to uranium concentrate powder. BRR has strengthened its emergency response plan and procedures, to ensure appropriate measures are taken in the event of a similar incident. Technical modifications were made to ensure suspected pressurized drums can be opened safely by workers. BRR has also installed three whole-body monitors at the exit of the facility, and everyone is required to use them before leaving the premises.

## INTERNATIONAL COOPERATION TO INFORM URANIUM PROCESSING INDUSTRY

CNSC staff participated in a U.S. Nuclear Regulatory Commission (NRC) working group, to update an information notice on uranium concentrate powder, to alert licensees to recent events involving pressurized drums of uranium concentrate to ensure that adequate measures are taken to prevent drum pressurization.

Workers at Cameco's uranium conversion facility (Port Hope, Ontario)







Workers at AECL's Chalk River Laboratories' National Research Universal reactor facility

## SHIELD SOURCE INC.

In March 2013, Shield Source Incorporated (SSI) of Peterborough, Ontario, announced it would not apply to renew its nuclear processing licence. In March 2014, SSI completed its clean-up of the facility following the discontinuation of operations. The CNSC provided regulatory oversight throughout this process to ensure the public and the environment were protected. SSI was granted a licence to abandon. Decontamination of the SSI site was completed for unconditional release of the facility. It was returned to its original state for industrial use.

## CHALK RIVER LABORATORIES – ATOMIC ENERGY OF CANADA LIMITED

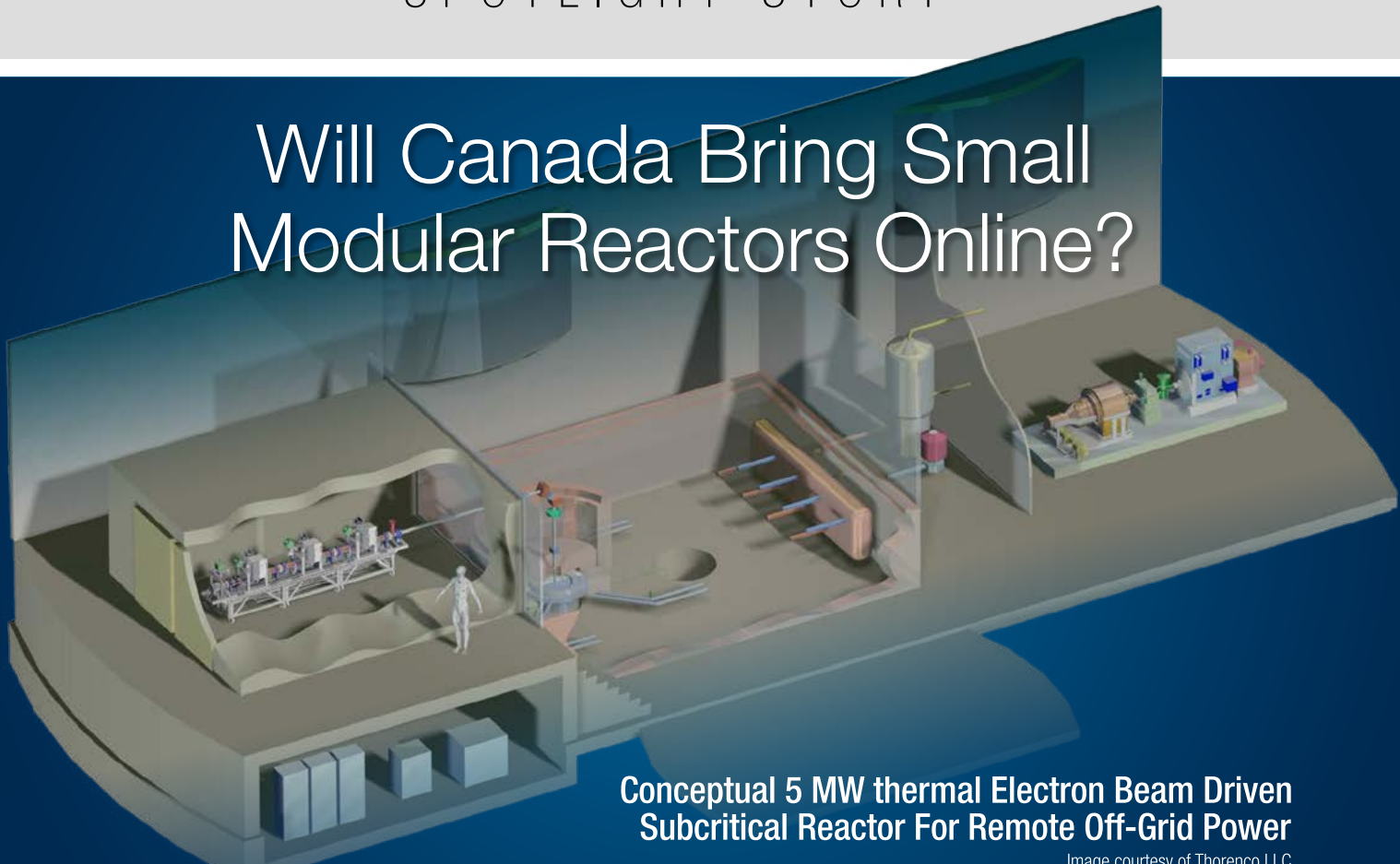
The Government of Canada announced in February 2013 that the management of Atomic Energy of Canada Limited's (AECL) nuclear laboratories would be restructured as the government seeks to implement a government-owned, contractor-operated (GO-CO) approach. The government will focus on three key objectives: managing its radioactive waste and decommissioning responsibilities; performing science and technology activities to meet core federal responsibilities; and supporting Canada's nuclear industry, through access to science and technology facilities and expertise, on a commercial basis.

The CNSC is working to identify the licensing process for the GO-CO approach, and to identify its long-range research requirements for a national nuclear research facility.



## SPOTLIGHT STORY

# Will Canada Bring Small Modular Reactors Online?



**Conceptual 5 MW thermal Electron Beam Driven Subcritical Reactor For Remote Off-Grid Power**

Image courtesy of Thorenco LLC

Small modular reactors, or SMRs, are a next-generation nuclear power technology that many countries are examining today as a possible source of energy for tomorrow. The Canadian Nuclear Safety Commission (CNSC) has been studying this new technology for several years.

## WHY SMALL IS BEING CONSIDERED

As their name implies, SMRs are being designed to produce smaller energy outputs than conventional nuclear power plants – in the range of approximately 5 to 300 megawatt electric (MWe) rather than the 1,000 MWe produced by conventional reactors. Why? Some grids simply cannot accommodate the output of a large plant, and are looking for something smaller. Having smaller plants also means that generation capacity can be added in smaller increments. This

is important, considering that many old fossil-fuel generating plants (which SMRs would replace) have outputs under 300 MWe.

Other (much smaller) SMRs are being considered in remote locations that have difficulty finding economically efficient and reliable energy sources. A tiny reactor (ranging from 5MWe to no larger than 25 MWe) has the potential to replace an off-grid fossil-fuel fired generator along with the need for regular fuel shipments (which can be very expensive for remote sites). At the same time, remote locations not connected to traditional grids have widely ranging needs for electricity; this makes SMRs suitable to those locations, as they are designed to produce a lower amount of energy when demand diminishes.

Many SMRs are designed to be constructed in prefabricated modules. By assembling them at a factory and then shipping and installing them at their destination, the objective is that the quality of the finished product will be higher and the associated construction costs will be significantly lower.

## DESIGNING WITH ENHANCED SAFETY IN MIND

All SMR designs promise enhanced safety characteristics, which not only promotes greater public acceptance, but also makes their operation and maintenance safer, simpler, more efficient, and less costly. Features include:

- having a reactor core that is small enough that the possibility of fuel melting in an accident is significantly reduced (or eliminated altogether)
- reactor cooling systems that can keep the fuel cool and safe in the absence of external power
- a core fission reaction that always wants to go to a safe state when a power upset occurs (inherent core safety characteristics)

- in some cases, reactors and their spent fuel storage pools will be located underground, which would make them even harder to access than conventional reactors

## SMALL MODULAR REACTORS MUST MEET CANADIAN REQUIREMENTS

Canada already has a robust and, for the most part, technology-neutral regulatory framework, which can be applied equally to nuclear power plants or SMRs. As the CNSC continues to develop its requirements and guidance, staff are considering how these documents would be interpreted and applied to possible SMR projects of all sizes.

The CNSC encourages early engagement, to confirm that requirements and guidance are clearly understood by those who use them. As a tool for vendors (including those proposing SMRs), the CNSC offers an optional “pre-licensing vendor design review” process to allow vendors to verify, at a high level, the acceptability of their plant design with respect to Canadian nuclear regulatory requirements and expectations, as well as Canadian codes and standards. These reviews also identify fundamental barriers to licensing a new design in Canada, and assure that a resolution path exists for any design issues identified in the review while ensuring the highest safety standard. On the other hand, the process is a tool to help a vendor locate issues early and correct them before licensing. This review does not certify a reactor design or involve the issuance of a licence under the *Nuclear Safety and Control Act*, and it is not required as part of the licensing process for a new nuclear power plant. The conclusions of any design review do not bind or otherwise influence decisions made by the Commission.



# SAFE NUCLEAR POWER GENERATION



## Safe operation of nuclear reactors in Canada

The Canadian Nuclear Safety Commission (CNSC) regulates the nuclear sector in Canada, including nuclear power plants (NPPs), through licensing, reporting, verification and enforcement. For each NPP, CNSC staff conducts inspections, assessments, reviews and evaluations of licensee programs, processes and safety performance.



## SAFETY SUMMED UP

In 2013–14, the evaluations of all the findings concerning safety and control areas show that all NPPs in Canada operated safely, making adequate provisions for the protection of health, safety and security of persons and the environment from the use of nuclear energy, while also meeting international obligations on the peaceful use of nuclear energy.

Highlights include:

- There were no serious process failures at any NPP.
- No worker or member of the public received a radiation dose above regulatory limits.
- The frequency and severity of non-radiological injuries to workers was minimal.
- No radiological releases to the environment from the stations exceeded the regulatory limits.
- Licensees complied with their licence conditions regarding Canada's international obligations.

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## CANADA'S NUCLEAR POWER PLANTS

Canada's NPPs are located at five sites in three provinces and are operated by four separate licensees. There are 19 reactor units operational at Darlington, Pickering, Bruce and Point Lepreau. Pickering Units 2 and 3 remain in safe storage, and Gentilly-2 continued to transition to safe storage. NPP sites range in size from one to eight power reactors, all of which are of the CANDU (CANada Deuterium-Uranium) design. This

design was originally developed by the Canadian Crown Corporation Atomic Energy of Canada Limited (AECL), and is now under licence by the SNC Lavalin Group Inc. through its wholly owned subsidiary, Candu Energy Inc.

In 2013–14:

- The two licences for the Pickering NPPs A and B were amalgamated under one licence and renewed in 2013, as the nuclear generating station prepares to cease operation in 2020 after almost 50 years of service.

- The Pickering operating licence included a regulatory hold point for the re-assessment of operation for the fuel channels of the Pickering B Units beyond the assumed nominal design life of 210,000 hours of effective full power operation. OPG made a request to the Commission for the removal of the regulatory hold point at the May 7, 2014 public hearing. The Commission approved OPG's request and directed the licensee and CNSC staff to update the Commission on a detailed risk improvement plan.

## SAFETY PERFORMANCE ASSESSMENT

Each year, the CNSC publishes a report on the safety performance of Canada's NPPs.

CNSC staff use the safety and control area (SCA) framework in evaluating each licensee's safety performance. The framework includes 14 SCAs; each is sub-divided into specific areas which define its key components.

Table 1 summarizes the 2013 ratings for Canada's NPPs. This table presents the SCAs for each station, the industry averages, and the integrated plant ratings that gauge a plant's overall safety performance. The rating categories are "fully satisfactory" (FS), "satisfactory" (SA), "below expectations" (BE) and "unacceptable" (UA). 2013 ratings of particular note include:

- A total of 11 "fully satisfactory" ratings were obtained – the highest number since 2010, and an increase of two from the previous maximum (recorded in 2012).
- All NPPs received either a "fully satisfactory" or "satisfactory" rating in each of the SCAs.
- Canada's NPPs industry achieved an average rating of "fully satisfactory" in the conventional health and safety SCA.
- The integrated plant ratings in 2013 were either "fully satisfactory" or "satisfactory" for all stations.

## IMPLEMENTATION OF CNSC ACTION PLAN IN RESPONSE TO FUKUSHIMA

The CNSC *Integrated Action Plan* was established in response to the events at Fukushima. This *Integrated Action Plan* identifies measures to further improve nuclear safety through:

- strengthened defence in depth
- enhanced emergency preparedness
- improved regulatory framework and processes
- enhanced international collaboration, communication and public education

In total, the plan lists 36 distinct action items for NPPs, non-NPPs, and the CNSC. Completion of all action items is on track for 2015.

## SIXTH REVIEW MEETING OF THE CONVENTION ON NUCLEAR SAFETY

The CNSC led the Canadian delegation at the 6th Review Meeting of the *Convention on Nuclear Safety*, held in Vienna, Austria, from March 24 to April 4. These review meetings are held every 3 years.

Sixty-eight countries presented their country reports, describing how each of them fulfilled its obligations to the Convention, including safety improvements arising from the lessons learned from Fukushima. There were also special presentations on collective safety improvements, also arising from the lessons learned from Fukushima.

The review meeting approved by consensus the many improvements to the review process that the Working Group on Effectiveness and Transparency (formed to address outcomes of the Second Extraordinary Meeting on the lessons learned from the Fukushima Daiichi nuclear accident) had developed before the meeting. The Contracting Parties also agreed to hold a diplomatic conference to consider an amendment to the *Convention on Nuclear Safety* that was proposed by Switzerland. The amendment addresses the design and construction of new and existing NPPs.



Table 1: Canadian nuclear power plant safety performance ratings for 2013

Safety and control area	Bruce A	Bruce B	Darlington	Pickering	Gentilly-2	Point Lepreau	Industry average
Management system	SA	SA	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA	SA	SA
Operating performance	SA	SA	FS	SA	SA	SA	SA
Safety analysis	SA	SA	SA	SA	SA	SA	SA
Physical design	SA	SA	SA	SA	SA	SA	SA
Fitness for service	SA	SA	SA	SA	SA	SA	SA
Radiation protection	SA	SA	FS	FS	SA	SA	SA
Conventional health and safety	FS	FS	FS	SA	SA	FS	FS
Environmental protection	SA	SA	SA	SA	SA	SA	SA
Emergency management and fire protection	SA	SA	SA	SA	SA	SA	SA
Waste management	SA	SA	SA	SA	SA	SA	SA
Security	FS	FS	FS	FS	SA	SA	FS
Safeguards and non-proliferation	SA	SA	SA	SA	SA	SA	SA
Packaging and transport	SA	SA	SA	SA	SA	SA	SA
Integrated plant rating	SA	SA	FS	SA	SA	SA	SA

**Rating categories:**

FS – fully satisfactory

SA – satisfactory

BE – below expectations

UA – unacceptable



## SPOTLIGHT STORY

# Managing the Lifecycle Process To Ensure the Safety of Canada's Nuclear Power Plants

**Mock-up reactor built to train Darlington workers  
prior to the start of the refurbishment in 2016**

Photo credit: Ontario Power Generation

The Canadian Nuclear Safety Commission (CNSC) requires nuclear power plant operators to manage existing reactors to the highest standards, as safety is our primary concern. Overseeing the safe management and upgrading of plants (and has always been) one of our most important tasks.

There are many ways to safely extend the life of an aging nuclear power plant, by replacing, refurbishing or modernizing major equipment and systems, and ensuring that proper processes are in place to effectively manage aging. In fact, by using a variety of processes, protocols and techniques to update these plants, operators can actually improve overall safety.

## LICENCE REQUIREMENTS RELATED TO AGING MANAGEMENT OF PLANT COMPONENTS AND STRUCTURES

In accordance with their power reactor operating licence, operators are required to ensure that all systems and equipment are fit for service. More details about compliance verifications are provided in each operator's licence conditions handbook, which offers guidance on aging management and the lifecycles



**AECL worker performing research in support of aging management programs of operating nuclear power reactors (Chalk River, Ontario)**

of major equipment and components. The handbooks also describe mandatory safety reviews and other suggested activities which the operator should carry out as part of the aging management program.

The regulatory document *Aging Management* sets out specific requirements to proactively manage the aging of plant components and structures throughout the various phases of a reactor facility's lifecycle. Operators must ensure there is a comprehensive integrated aging management program for the overall reactor facility, along with detailed lifecycle management plans for critical components and structures. They must also undertake detailed safety analyses and produce up-to-date reports at regular intervals, to show how safe a nuclear power plant would be in the event of an accident (taking plant aging into account).

## MANDATORY SAFETY REVIEWS

When a nuclear power plant is being refurbished, the operator must undertake a systematic and comprehensive safety review (including an environmental assessment), which identifies all of the possible safety improvements that can be made to a particular reactor – such as installing additional emergency systems that help prevent severe accidents or that reduce the consequences of any accidents that may occur.

Operators also perform a probabilistic safety assessment (PSA) to establish the possibility and consequences of highly improbable accidents (such as those leading to severe core damage or radioactive releases), for comparison against the safety goals for the plant. Based on this comparison, PSAs are used to supplement the deterministic safety assessment, to help identify possible modifications that would improve safety (either by further reducing the possibility of accidents, or by mitigating the consequences).



# SAFE NUCLEAR MEDICINE



## Diagnosing and treating diseases

The Canadian Nuclear Safety Commission (CNSC) regulates medical uses of nuclear substances and radiation devices, ensuring that equipment is safe for Canadians.



## SAFETY SUMMED UP

- The CNSC performed 265 inspections in the medical sector during 2013–14.
- Data from sampled annual compliance reports in the medical sector:
  - In 2013, 87.6% of medical sector nuclear energy workers and other workers combined received less than the annual radiation dose limit for members of the public of 1 mSv/yr. 100% of medical sector nuclear energy workers received less than the annual radiation dose limit for nuclear energy workers of 50 mSv/yr.

Nuclear medicine diagnoses diseases (such as cancer and heart disease) by combining radioactive isotopes with other chemical compounds to form radiopharmaceuticals. Radiopharmaceuticals are given to patients by injection, or as a pill. Once inside the patient, the radiopharmaceuticals give off radiation that is detected by equipment such as gamma cameras or PET scanners. These create images of organs, tissues and other internal structures that a doctor couldn't see otherwise. In some cases, radioactive isotopes are used to treat illnesses such as thyroid cancer.

The CNSC regulates medical accelerators and Class II nuclear facilities and other equipment, located at hospitals throughout Canada. Historically, the Canadian medical sector represents around 20 percent of all CNSC licences.

## NUCLEAR SUBSTANCES USED IN MEDICAL APPLICATIONS

The licensing demand for indium-111 has also increased due to an interest in using indium for imaging white blood cell concentrations, which can indicate the possibility of an infection. The use of cyclotrons and other accelerator technology for the production of medical isotopes continues to grow.

## LICENSING LOW-ENERGY ACCELERATORS

The CNSC recently began licensing all particle accelerators operating at a beam energy level of 1 megaelectron-volt (MeV) or more. This technology



enables physicians to more accurately target small tumours in the body, and hybrid devices provide the ability to image and treat patients using the same machine. At the end of 2013–14, there were 53 low-energy accelerators licensed in Canada. The decision to regulate low-energy accelerators ensures adequate and consistent regulatory oversight of this class of equipment.

of sealed sources during their entire lifecycle (including while the sources are in storage, transported or being stored during transportation). CNSC staff participated in many outreach sessions, to introduce the new expectations and explain the implementation of this regulatory document. The first phase of implementation is planned for 2014.

## SECURITY OF NUCLEAR SUBSTANCES: SEALED SOURCES

In 2013, the regulatory document REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* was published. It sets out the minimum security measures that licensees must implement to prevent the loss, sabotage, illegal use, illegal possession, or illegal removal

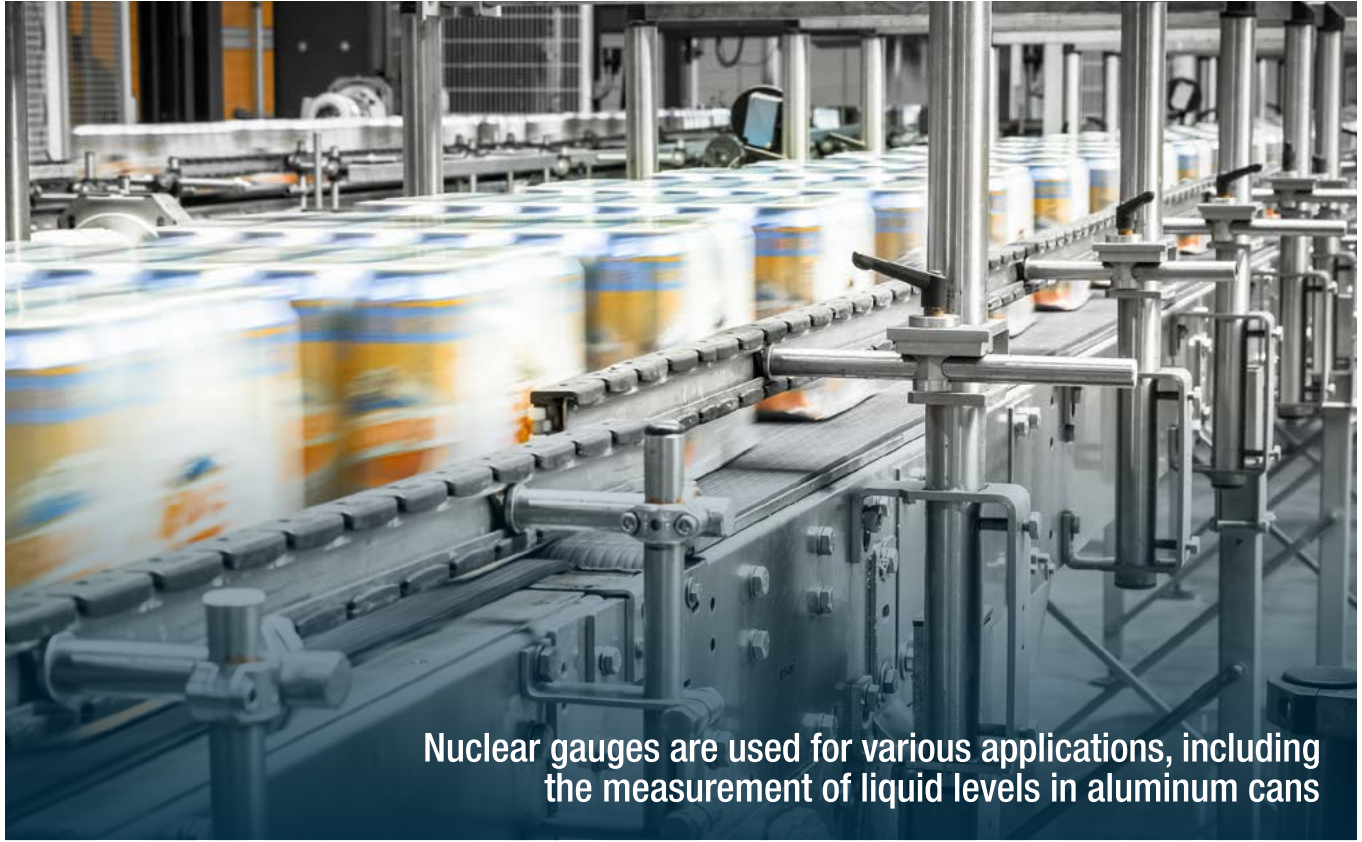


# SAFE NUCLEAR SUBSTANCES AND TRANSPORTATION



Nuclear technology contributes to Canadians' everyday life and well-being

From licensing the possession of nuclear substances to overseeing the safe transport of nuclear material, the Canadian Nuclear Safety Commission (CNSC) ensures effective regulatory oversight of all uses of nuclear-related substances in industry, medical, academia and the commercial sectors.



Nuclear gauges are used for various applications, including the measurement of liquid levels in aluminum cans

## SAFETY SUMMED UP

- In 2013–14, the CNSC performed 1,284 inspections in the academic, commercial and industrial sectors.
- In general, licensees across all sectors continued to show satisfactory compliance ratings for operating performance and radiation protection. The compliance levels continue to trend towards higher average satisfactory ratings.
- The CNSC issued 18 orders to licensees across the industrial/academic sector during the reporting period. This represents a reduction from the 21 orders issued in 2012–13.
- As of March 2014, the CNSC conducted 235 inspections on 112 industrial radiography licences.
- Data sampled from annual compliance reports in the industrial, academic, research and commercial sectors demonstrate that, from 2008 to 2013, the vast majority of nuclear energy workers continued to receive less than the public dose limit of 1 mSv/yr. This is significantly less than the regulatory limit of 50 mSv/yr established for nuclear energy workers.

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Nuclear technology touches many aspects of life. It is used in medicine, industrial applications, academic and research projects and commercial ventures. The CNSC carries out licensing, certification and compliance verification for nuclear substances, prescribed equipment and Class II nuclear facilities involved in medical, industrial, commercial and academic/research settings.

Canada is both a significant producer and major shipper of nuclear substances. The CNSC shares responsibility with Transport Canada for overseeing the transport throughout the country of more than a million packages containing nuclear substances every year.

## INDUSTRY

Portable gauges are most often used to measure moisture content and verify the density of pavement. The CNSC's focus for inspecting portable gauges has shifted away from reviewing records and toward a performance-based method that involves direct observation of the operator's behaviour. The result is that the CNSC is now issuing more orders for corrective action.

## ACADEMIA AND RESEARCH

Licensees in the academic and research sector (in universities, colleges and research laboratories, both private and public) use open and sealed sources, radiation devices and accelerators for teaching and for pure and applied research.

Open-source nuclear substances are used in research on biological systems, analytical chemistry, and migration of labelled compounds through materials, as well as for the tracking of fluid flow (using tracers).

## COMMERCIAL SECTOR

As of April 2014, the industrial sector accounted for more than 1,435 licences, the academic and research sector for 240, and the commercial sector for 283. The CNSC focuses its inspections where risk is highest and where the regulator has concerns about a licensee's performance.

## FINANCIAL GUARANTEES FOR CLASS II AND NUCLEAR SUBSTANCES AND DEVICES LICENSEES

During the previous fiscal year (2012–13), a cost-benefit analysis of different acceptable financial guarantee instruments for Class II and nuclear substances and devices licensees was completed. It was determined that an insurance model option for the CNSC would be the most viable and economical instrument for licensees.

A proposal to amend Class II and nuclear substances and devices licence conditions to require a financial guarantee – in the form of a contribution by licensees, to provide the CNSC with coverage under the insurance model – will be presented to the Commission for decision in 2014–15.

## LOST OR STOLEN NUCLEAR SUBSTANCES AND RADIATION DEVICES

The CNSC has a program in place to ensure that lost or stolen nuclear substances and radiation devices are tracked and recovered as soon as possible.

**Table 2: Lost or stolen sealed sources or radiation devices and other events**

	2011–12	2012–13	2013–14
Number of reported events for lost or stolen sealed sources or radiation devices	8	16	14
Number of events where lost or stolen sealed sources were recovered	1	5	7
Number of events where lost or stolen sealed sources have not yet been recovered	7	11	7
Number of events where sealed sources or radiation devices lost or stolen from previous years were found	7	2	3





Cask used for the transportation of irradiated fuel (Chalk River, Ontario)

## PACKAGING AND TRANSPORT OF NUCLEAR SUBSTANCES REGULATIONS

The CNSC is updating its *Packaging and Transport of Nuclear Substances Regulations* to take into account changes to international regulations issued by the International Atomic Energy Agency. In 2012, a discussion paper was published by the CNSC, in an effort to communicate publicly before formal consultations took place. The draft regulations are under development. Public consultation will be launched in summer 2014 via publication in the *Canada Gazette Part I*. Depending on the feedback received, the final publication is expected in mid-2015.

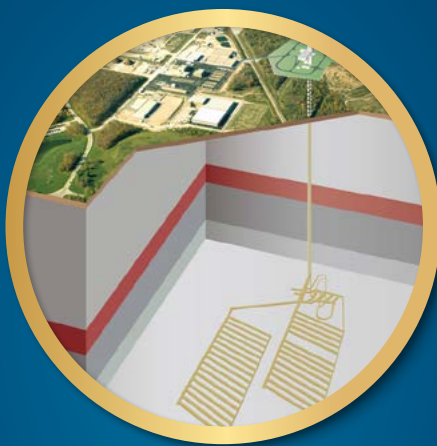
## TRANSPORT OF HIGHLY ENRICHED URANIUM AND URANYL NITRATE LIQUID

In 2012, the U.S. and Canada signed an agreement for the repatriation of the U.S. produced highly enriched uranium (HEU) fuel stored at the Atomic Energy of Canada Limited (AECL) Chalk River facility. Under this agreement, the fuel from SLOWPOKE reactor cores stored at Chalk River was shipped to Savannah River, South Carolina, in 2012. The spent fuel from the NRU/NRX reactor is expected to be shipped in the coming year.

NAC International (based in Atlanta and under contract with AECL) has submitted an application to the CNSC, the U.S. Nuclear Regulatory Commission and the U.S. Department of Transport (USNRC/USDOT), for the approval of a package to transport the highly enriched uranyl nitrate liquid solution, a by-product from the production of medical isotopes, currently stored in the fissile solution storage tank at AECL Chalk River. Certification of the package is required by both the CNSC and the USNRC/USDOT.



# SAFE WASTE MANAGEMENT



## Secure storage for future generations

The Canadian Nuclear Safety Commission (CNSC) regulates radioactive waste in Canada, to ensure it poses no unreasonable risks to people or the environment.



## SAFETY SUMMED UP

- Doses to the public did not exceed regulatory limits of 1 mSv/yr.
- Doses to workers at waste facilities did not exceed regulatory limits of 50 mSv/yr.
- No regulatory releases from nuclear waste facilities exceeded regulatory limits.

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## BEAVERLODGE MINE AND MILL WASTE FACILITY

In 2013–14, the Commission held a public hearing and rendered a decision to renew the waste facility operating licence at the decommissioned Beaverlodge Mine and Mill site in Saskatchewan.

## TWO GEOLOGIC REPOSITORY PROJECTS

Two long-term radioactive waste management initiatives are underway in Canada, and may result in geologic repositories. A geologic repository is constructed underground, usually at a depth of several hundred metres or more below the surface, in a stable rock formation.

1. Ontario Power Generation's (OPG's) proposed deep geologic repository (DGR) for low- and intermediate-level radioactive waste

OPG is proposing a deep rock vault in clay-rich limestone, over 600 metres below ground. The DGR is designed to be a long-term management facility for OPG's low- and intermediate-level radioactive waste. An independent joint review panel (JRP), appointed by the Minister of the Environment and the CNSC President in early 2012, is examining the proponent's environmental impact statement and licence application for the first phase and the environmental assessment information for all phases of the project.

Since January 2012, Dr. Stella Swanson, Dr. James F. Archibald, and Dr. Gunter Muecke – temporary members of the Commission, appointed under the *Nuclear Safety and Control Act* (NSCA) – have been engaged in the review of OPG’s plan to build and operate a DGR for the long-term management of low- and intermediate level radioactive waste.

This three-member panel held public hearings in September and October 2013, within the towns of Kincardine and Saugeen Shores, near the Bruce nuclear site where the DGR is proposed to be located.

During the public hearings, the panel heard 22 presentations by OPG, 19 from the CNSC, 17 from federal and provincial departments and ministries, 6 from local municipalities, 7 from First Nations and Métis groups, as well as 121 oral interventions and statements from members of the public and other organizations and bodies. Additionally, 73 written interventions were read into the record; 71 undertakings were responded to by the proponent, regulator, other authorities and the public; and there were numerous questions from the panel and those in attendance. The joint review panel must be satisfied that the proposed project has met stringent requirements under the *Canadian Environmental Assessment Act*, 2012, as well as the NSCA, before a licence to prepare site and construct the DGR can be issued to OPG. The CNSC has been providing technical and research assistance as the JRP conducts its complex work. The panel has submitted over 600 information requests to OPG on varied topics concerning the project, including 25 made during the public hearings in 2013, and 9 submitted thereafter. Additional hearings of the JRP are to be held in September 2014.

Once the panel is satisfied that sufficient information has been provided, an environmental assessment report will be prepared and submitted to the federal Minister of the Environment, for a decision on their recommendations. If approved by the Minister, the project would proceed to a decision by the panel on the issuance of a CNSC licence to prepare a site and construct for the DGR project.

2. The Nuclear Waste Management Organization’s plan for a deep geologic repository for used nuclear fuel

Since 2010, the Nuclear Waste Management Organization (NWMO) has been implementing its site selection process to identify an informed and willing community to host a DGR for Canada’s used nuclear fuel. As of March 31, 2014, 15 communities were still part of the NWMO’s “learn more” process.

At this early stage, the CNSC has been meeting with the communities involved in the NWMO’s “learn more” process, to help them better understand the safety and regulatory matters that would be examined for this used nuclear fuel repository.

In 2013–14, the CNSC met with the communities of Elliot Lake, the North Shore, Blind River, Spanish, and the South Bruce Community Liaison Committee. The CNSC also conducted two CNSC open houses in the Ontario communities of Ignace and Ear Falls.

## NUCLEAR LEGACY SITES

Legacy sites consist of outdated and unused research facilities and buildings, a wide variety of buried and stored radioactive waste, and affected lands. They have resulted from more than 60 years of nuclear research and development activities by the Canadian uranium industry, the National Research Council of Canada and AECL. CNSC staff perform periodic inspections, to evaluate if these sites and their safety documentation comply with regulatory and environmental requirements, as well as with the latest criteria for quality assurance, security, emergency preparedness and other protective measures.



# SAFE ENVIRONMENT



Protecting the environment today  
and for future generations

The Canadian Nuclear Safety Commission (CNSC) works hard to make sure that nuclear activities in Canada will not harm people or the environment.





# SAFETY SUMMED UP

*Radiation doses to the public living around nuclear facilities remain far below regulatory dose limits.*

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## ENVIRONMENTAL ASSESSMENTS UNDER THE NUCLEAR SAFETY AND CONTROL ACT

The CNSC has a robust regulatory framework and mandate for the protection of the environment and the health and safety of persons. This allowed environmental assessments that were no longer required under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) to be seamlessly completed under the *Nuclear Safety and Control Act* (NSCA).

The environmental assessment (EA) under the NSCA is a component of the CNSC's licensing process, and is carried out as part of the CNSC's review of all licence applications. Information provided from the EA supports the regulatory decision being sought under the NSCA.

In September 2013, REGDOC-2.9.1, *Environmental Protection: Policies, Programs and Procedures*, was published as the first of a three-part suite of regulatory documents to help licensees implement environmental protection policies, programs and procedures at Class I nuclear facilities and uranium mines and mills. This document provides guidance reflecting lessons learned from the Fukushima Daiichi nuclear event of March 2011, and addresses findings from the CNSC *Fukushima Task Force Report*.

The drafting of the second document in the REGDOC-2.9.1 suite (*Environmental Protection: Environmental Assessments*) was completed this year and will undergo public review in early 2014. This document describes the conduct of EAs under the NSCA and for EAs under the CEAA 2012.

It is anticipated to be presented to the Commission for publication by the end of the 2014–15 fiscal year.

## DARLINGTON NEW-BUILD ENVIRONMENTAL ACTIVITIES CONTINUE

CNSC staff provided technical expertise on the following Darlington new-build items: next steps for the Round Whitefish Action Plan, review of OPG's 2013 Bank Swallow Program results, and review of OPG's aquatic-related studies. The CNSC continues to be involved with Darlington new-build related activities, however future activity will be impacted by the Ontario Government decision under its long-term energy plan, to defer the building of new nuclear capacity at Darlington.

## DFO-CNSC MEMORANDUM OF UNDERSTANDING

In December 2013, the CNSC and Fisheries and Oceans Canada (DFO) signed a Memorandum of Understanding (MOU), supporting the Government of Canada's regulatory reform objectives through the coordination of activities related to the review and decisions made under section 35 of the *Fisheries Act* for Class I nuclear facilities and uranium mines and mills. This section of the *Fisheries Act* prohibits causing "serious harm to fish" "that are part of a commercial, recreational or Aboriginal fishery".

Though DFO is accountable for decisions under the habitat provisions of the *Fisheries Act*, under the MOU the CNSC has been designated as the responsible authority for the assessment and monitoring of environmental impacts on fish, including species listed in the *Species at Risk Act* (SARA), and to make recommendations to DFO related to authorizations under the *Fisheries Act*.

The CNSC began its review role under the MOU with the Lake Huron water intake at the Bruce A and B Nuclear Generating Stations. Reviews of other facilities will be taking place in the coming fiscal year.

During the 2013–14 fiscal year, the CNSC worked with DFO to deliver training to CNSC staff on the overview of the *Fisheries Act* and the terms of the MOU. Along with DFO, the CNSC has developed a work-plan for implementing the MOU, which includes developing

compliance protocols and tools for reporting and monitoring, a communications plan, and knowledge transfer and sharing.

## INDEPENDENT ENVIRONMENTAL MONITORING PROGRAM

The CNSC's independent environmental monitoring program is a new compliance verification initiative launched in 2012. Its objective is to independently verify that the public and the environment around CNSC-regulated facilities are safe and well-protected.

During the 2013–14 fiscal year, the program verified seven sites and found no risk to the public and the environment. In 2014–15, the verification will be extended to cover fourteen sites.

Of particular interest this past year was the independent monitoring of the levels of uranium in soil samples from the GE Hitachi Nuclear Energy Canada (GEH-C) Inc.'s uranium dioxide facility and surrounding area, in Toronto, Ontario. In 2012, residents living near the facility raised concerns about the concentration of uranium in soil resulting from the facility's air emissions. GEH-C provided soil sampling reports to the public, demonstrating that uranium levels are below the applicable soil quality guidelines; however, public concern continued to mount. To address this concern, the Ontario Ministry of Environment (MOE) undertook independent soil sampling in public areas.

The MOE's soil sampling coincided with GEH-C's regularly scheduled annual sampling, and each party performed its own soil sample collections in June 2013. The CNSC was present and requested split samples from both sampling campaigns, so it could conduct its own independent analysis to verify results.

The CNSC's overall conclusion, based on the licensee's monitoring data and the analysis of the soil samples, is that uranium concentrations in soil around the GEH-C Toronto facility are well below the accepted standards protecting human and environmental health. The public living near the facility and the environment is protected and safe from the facility's nuclear activities. The CNSC published the findings and test results in October 2013,





CNSC staff at the Limebank Laboratory (Ottawa, Ontario)

in the report *Uranium Levels in Soil Samples Around GE Hitachi Nuclear Energy Canada Inc., Toronto Facility*, which is available on the CNSC website.

## ISO-17025 ACCREDITATION OF THE CNSC LABORATORY MOVES FORWARD

The CNSC Laboratory, which supports the CNSC's mandate by providing radiation instrument calibration and sample analysis, is seeking accreditation to ISO-17025 standard (General requirements for the competence of testing and calibration laboratories) to ensure the highest quality of services to CNSC staff. In the first phase, the scope of the accreditation will cover calibration of gamma radiation instruments. The documentation supporting the management and technical requirements of the standard was drafted and reviewed internally. The identified additional information and documents were also drafted and the review is in progress.

The application for ISO-17025 accreditation of the radiation instrument calibration services to the Accreditation Body (NRC CLAS) will be ready for submission in the 2014–15 fiscal year. Upon the successful accreditation of calibration services, the scope will be extended to analytical services.

## CNSC HOSTS SUCCESSFUL INTERNATIONAL IAEA – ALMERA MEETING

The CNSC hosted the 10th IAEA–ALMERA coordination meeting in Ottawa in the fall of 2013. Thirty-six participants from 20 countries attended, representing 25 member laboratories and the International Atomic Energy Agency (IAEA).

ALMERA (Analytical Laboratories for the Measurement of Environmental Radioactivity) is a worldwide network of analytical laboratories, established by the IAEA in 1995. The network now has 139 member laboratories from 81 countries. With methodological and data quality support from the IAEA, and through collaborative method development and validation, ALMERA laboratories can provide internationally acceptable, radioanalytical services in normal situations and upon accidental or intentional releases of radioactivity.

The coordination meeting reviewed the status of the planned activities and discussed strategies for increasing collaboration and capabilities within ALMERA. During the meeting, the CNSC Laboratory (representing Canada) was appointed the regional ALMERA coordinator for the North and Latin America region for a period of five years (2013–18).

# NATIONAL SECURITY AND INTERNATIONAL COMMITMENTS



## We lead internationally

Canada is a world leader in promoting the peaceful use of nuclear energy. To fulfill Canada's international obligations, the Canadian Nuclear Safety Commission (CNSC) supports and implements our country's international agreements in the areas of nuclear safety, non-proliferation and security.





# NATIONAL SECURITY AND INTERNATIONAL COOPERATION SUMMED UP

- In January 2014, the CNSC and the United States Department of Energy concluded amendments to the existing bilateral administrative arrangement pursuant to the nuclear cooperation agreement between Canada and the United States.
- The CNSC and the Nuclear Regulation Authority of Japan concluded in May 2013 amendments to the existing bilateral administrative arrangement on radioactive source import and export regulatory controls.

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## **International Cooperation – CNSC Hosts International Conference on Safety**

The CNSC hosted more than 50 countries at the International Atomic Energy Agency (IAEA) International Conference on Effective Nuclear Regulatory Systems, held in Ottawa, Ontario, in April 2013. This conference plays a vital role in the global efforts undertaken by senior nuclear safety and security regulators to review issues that are important to the global nuclear regulatory community. The focus of the 2013 conference was to examine the key role of regulators in ensuring safety and security. Key actions items resulting from the conference

included: continuous improvement of regulatory systems; development of “regulatory operating experience programs”; a requirement for national action plans and follow-up peer review missions; safety review of used nuclear fuel in pools; development and testing of national communication plans; and the implementation of a culture of accountability.

The CNSC maintains cooperative relationships with its international counterparts. In 2013–14, it welcomed several foreign delegations and hosted two international working group meetings on specific nuclear study topics.

## NON-PROLIFERATION AND IMPORT/EXPORT CONTROLS

The major elements of Canada's nuclear non-proliferation policy involve support to international non-proliferation initiatives and activities, regulatory import and export controls, implementation of international safeguards measures and security commitments.

As of 2013–14, 28 nuclear cooperation agreements were in place between Canada, other countries and EURATOM. The CNSC provides technical expertise to the Canadian Department of Foreign Affairs, Trade and Development in the negotiation of these agreements, and is responsible for implementing the agreements through administrative arrangements negotiated with its regulatory counterparts.

The CNSC works to ensure that Canada's nuclear exports are used for peaceful purposes only, as well as to promote a strong system for the safe and secure use of nuclear substances internationally.

## SAFEGUARDS

The CNSC is Canada's designated safeguards authority, responsible for managing Canada's safeguards agreements with the IAEA<sup>1</sup>. The ultimate goal of the

CNSC's safeguards program is to assure both Canadians and the international community that all nuclear material – roughly defined as uranium, plutonium, and thorium – in Canada is properly accounted for, and used only for peaceful activities, and that Canadian exports are only for peaceful purposes. As Canada's safeguards authority, the CNSC also actively supports the IAEA in their ongoing efforts to evolve the safeguards system towards greater effectiveness and efficiency, for benefit both within Canada and abroad.

## SAFEGUARDS ACTIVITIES IN CANADA

The CNSC carries out independent evaluations of licensees, to ensure that they are meeting their safeguards requirements, specifically to ensure that they are prepared to support IAEA activities at their sites. The IAEA carries out safeguards inspections aimed at verifying Canada's inventories of nuclear material (as well as other activities, such as equipment installation and maintenance) and the verification of design information on nuclear facilities, as provided by the CNSC. Some of these IAEA activities are carried out on short notice or an unannounced basis. The CNSC participates in IAEA inspections and activities whenever possible, both to facilitate the activity and to verify licensee compliance with CNSC regulatory requirements.

**Table 3: Onsite safeguards activities in Canada, April 1, 2013, to March 31, 2014**

Activity type	Number of inspections
CNSC inspections	18
IAEA inspections	56
Design information verifications	23
Equipment installation and maintenance	50
Other	19

<sup>1</sup> INFCIRC/164 and INFCIRC/164/Add.1, both available at [www.iaea.org](http://www.iaea.org)

**Table 4: State accounting reports submitted by the CNSC to the IAEA between April 1, 2013, and March 31, 2014**

Type of report	Number of reports submitted
Inventory change report	334
Physical inventory listing	51
Material balance report	51

### Definitions:

- **Inventory change reports** cover all inventory changes over a one-month period for an individual licensee (submitted monthly)
- **Physical inventory listings** summarize the inventory present at a given facility as of the date of its inventory taking (submitted annually)
- **Material balance reports** show the beginning inventory, all increases, all decreases, and the ending inventory for the period between two inventory takings at an individual licensee (submitted annually)

Based on its activities in Canada, the IAEA annually evaluates Canada's fulfillment of its safeguards obligations. For 2013, Canada again achieved the highest safeguards conclusion, confirming that all declared material in Canada has peaceful uses, and that there are no other undeclared materials and/or activities. This result indicates a high IAEA confidence in the exclusively peaceful nature of Canada's nuclear program. Canada's maintenance of this annual conclusion is a result of efforts by the CNSC and Canadian licensees in tracking inventories and movements of nuclear material; regularly submitting large quantities of required information to the IAEA; supporting IAEA safeguards inspections and other technical activities; and resolving IAEA questions in a timely fashion, among others.

## NUCLEAR MATERIALS ACCOUNTANCY

The CNSC has the responsibility of keeping track of nuclear material inventories and their movements within Canada, and reporting on those inventories and movements to the IAEA. To meet these obligations, the CNSC requires licensees to regularly submit detailed nuclear materials accountancy information.

Each year, the CNSC receives approximately 10,000 reports on the movement of nuclear material, 2,500 monthly ledgers, and 200 reports resulting from inventory takings. The CNSC audits this data and uses it to generate State accounting reports, which are submitted to the IAEA on behalf of Canada, as required by the *Canada-IAEA Safeguards Agreement*.

In November 2013, the CNSC was the first nuclear regulator to implement an end-to-end e-business solution, allowing licensees to electronically report their nuclear material accounting information in a secure manner. Nuclear materials accountancy reporting (NMAR) provides licensees with a secure, fast and convenient method to upload nuclear materials accountancy reports to the CNSC in an electronic, machine-readable format. Feedback from stakeholders has been positive. Several licensees are already using NMAR, with several more in the process of acquiring the electronic credentials required to use the system. Most licensees with larger inventories are currently in the process of modifying their software to be compatible with NMAR and are expected to begin using the system in the near future.



## NUCLEAR MATERIAL IMPORTED AND EXPORTED FROM CANADA

Every year, large quantities of natural uranium are imported into and exported from Canada's uranium mines and uranium processing facilities. In 2013–14, 6,500 metric tons of natural uranium were imported into Canada, chiefly as uranium ore concentrates, while 17,300 metric tons of natural uranium were exported, mostly as uranium ore concentrates, uranium trioxide, and uranium hexafluoride. As of March 31, 2014, approximately 63,300 metric tons of uranium were in inventory at Canadian nuclear facilities.

## NUCLEAR SECURITY AND EMERGENCY PREPAREDNESS

### Canada moves to second place on security of nuclear materials

Canada recently ratified both the 2005 Amendment to the *Convention on the Physical Protection of Nuclear Material* and the *International Convention for the Suppression of Acts of Nuclear Terrorism* and has initiated plans to incorporate new IAEA transport of nuclear materials guidelines into its national regulations.

As a result, Canada moved to second place amongst the 25 countries that hold large inventory of nuclear materials. The 2014 Nuclear Threat Initiative (NTI)<sup>2</sup> Nuclear Materials Security Index is the second edition of a first-of-its kind public assessment of nuclear materials security conditions around the world. Developed with

the Economist Intelligence Unit (EIU), the NTI Index was created (a) to assess the security of weapons-usable nuclear materials around the world and (b) to encourage governments to take actions and provide assurances about the security of the world's deadliest materials. It has sparked international discussions about priorities required to strengthen security.

## PERFORMANCE TESTING PROGRAM AT HIGH-SECURITY FACILITIES

The CNSC has completed the third cycle of its Performance Testing Program (PTP) at high-security nuclear facilities, including nuclear power plants and AECL's Chalk River Laboratories.

The PTP continues to be an effective means of testing and validating that a licensee's physical protection systems are adequate and comply with performance and regulatory requirements.

The CNSC continues to utilize the Canadian Adversary Testing Team during these performance testing exercises, to play the role of a credible adversary in safe, realistic and challenging scenarios.

## OVERSIGHT OF SECURITY PERFORMANCE AT OTHER LICENSED FACILITIES

CNSC staff continued their other oversight roles, performing inspections, surveillance activities and technical assessments for other licensed sites and activities, including higher-risk radioactive sources used in various industrial and medical applications. This includes the regular review and approval of security plans for a wide variety of nuclear facilities where nuclear substances are used, processed or stored.

<sup>2</sup>NTI is a non-profit, non-partisan organization founded by Ted Turner and former United States Senator Sam Nunn; privately funded by Ted Turner, Warren Buffet, Carnegie Corporation, amongst others; administered by a Board of Directors. Its primary mission is to strengthen global security by reducing the spread of nuclear, biological and chemical weapons, and to work to reduce the risk that they will actually be used.



**CNSC staff participating in a national full-scale exercise (Exercise Unified Response)**

## EMERGENCY PREPAREDNESS

As a result of TEPCO's Fukushima Daiichi nuclear power plant accident in Japan in March 2011, the CNSC continues to lead in various initiatives, learn from various regulatory agencies and participate in different forums organized by the IAEA and other organizations.

The Canadian Standards Association's CSA-N1600 standard will be published to reinforce and establish criteria for emergency management programs for both onsite and offsite organizations that have a role to play when responding to a nuclear emergency at a Canadian nuclear power plant. This standard will provide essential requirements for these organizations to develop, implement, evaluate, maintain, and continuously improve their nuclear emergency management programs.

The CNSC, Health Canada and Public Safety Canada jointly sponsored two national nuclear emergency preparedness workshops (one in Ontario and one in New Brunswick) in March 2013, to engage stakeholders and achieve a common understanding of roles, responsibilities and capabilities when responding to a severe nuclear accident.

The CNSC and its key stakeholders participated in a national full-scale nuclear exercise.

Exercise Unified Response (ExUR) took place in May 2014. It was simulated at the Darlington Nuclear Generating Station and involved all levels of government, including the utility operator. This three-day exercise tested different aspects of emergency preparedness and response. With more than 50 organizations involved, this was the first national, multi-jurisdictional nuclear emergency response exercise to be conducted since 1999.

The CNSC and the U.S. Nuclear Regulatory Commission exchanged personnel for technical updates and confirmed participation in future nuclear emergency exercises. Discussions on issues based on nuclear power plant operating experiences took place, and benchmarking capabilities were developed.

On behalf of the Department of Foreign Affairs, Trade and Development, and as part of the Canadian government's commitment under the United Nations Security Council Resolution 1540, *Global Partnership Program*, the CNSC, the Royal Canadian Mounted Police, the Department of National Defence and the Public Health Agency of Canada were involved in the delivery of the CBRN (chemical, biological, radiological and nuclear) training to help selected countries combat nuclear and radiological terrorism. This specialized training, which is meant for first responders, has been well received and is highly successful.

# STAKEHOLDER RELATIONS



## Reaching out to Canadians

Canadian Nuclear Safety Commission (CNSC) staff travel from coast to coast, visiting Canadians in their communities and answering their questions on how we regulate the nuclear sector. This ongoing dialogue is important for increasing public understanding and trust in our role of protecting Canadians, their health and the environment. We have also made efforts to make our information more accessible by adopting several innovations in electronic media.





# IMPLEMENTING EFFECTIVE ENGAGEMENT APPROACHES

Engaging our stakeholders in two-way dialogues and disseminating credible and objective information is a big part of the CNSC's mandate. In today's increasingly technological-driven world, the CNSC is taking advantage of new means of communicating and engagement to maximize the conversation. Improving dialogue is not just better for helping stakeholders understand the issues, but also helps the CNSC in its own quest to learn and improve.

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In February 2014, the CNSC launched an improved website, sporting a different look and simplified structure based on the main activities it regulates. While the most-visited sections were kept intact, staff developed some new sections on popular topics, along with new features such as an A-to-Z index, a featured video, and quick links to the most-visited pages. Website visits (581,827) are up by 10 percent over last year, while the number of users (323,556) has increased by 16 percent for the same period.

With the increasing use of video, the CNSC released a host of informative videos about nuclear safety topics, and has featured them on the website and the CNSC's YouTube channel. The CNSC also continues to expand its reach through the use of its social media channels on Facebook and YouTube, maximizing cross-promotion opportunities so that new content developed is shared across all platforms.

On YouTube, the channel prominently profiles original CNSC content, which is continuously added as it is developed. It includes segments of Commission public hearings of particular interest. The channel also features playlists based on topics of interest, including both CNSC and third-party content.

On Facebook, the CNSC features a range of information, including updates on consultations for regulatory documents, and notices of public hearings and meetings. The CNSC also posts links to third-party content of interest and takes advantage of other Facebook features (such as the ability to create events when staff are participating in interesting outreach and engagement activities that are open to the public). We also make use of notes pages to disseminate information.

## A RENEWED APPROACH TO OUTREACH AND ENGAGEMENT

The CNSC has a reputation as a scientific expert in the field of nuclear energy, and we are asked, now more than ever, to take part in outreach activities such as classroom presentations, conferences and special events. The dissemination of technical, scientific and regulatory information on nuclear activities is part of our mandate, and a key function of this work is in how we reach out to – and engage – our stakeholders.

In 2013–14, the CNSC confirmed outreach and engagement as an organizational priority, and approved a new forward approach. As part of this strategy, the CNSC has identified many outreach opportunities for the coming year. These outreach activities are meant to demystify nuclear science, describe our role as Canada's nuclear regulator and bring a CNSC face into communities across the country. To deliver on these activities, staff from across the organization – experts in the fields of nuclear science and safety – have committed to participate. Our experts are also requested to present technical papers and presentations about the nuclear industry at conferences, seminars, technical meetings and workshops held both in Canada and around the world; their technical articles are often published in various journals. Abstracts of the 17 scientific and technical papers or journal articles, and electronic copies of the 48 presentations completed in 2013–14 by CNSC management and staff, are published on the CNSC website. Copies of the documents are made available to the public by contacting CNSC at [info@cnsccsn.gc.ca](mailto:info@cnsccsn.gc.ca) or by calling 613-995-5894 or 1-800-668-5284 (in Canada).

To support these efforts, the CNSC continues to build new dynamic tools such as CNSC Online – a series of interactive online learning modules – and youth-oriented handouts.

## DISSEMINATING INFORMATION – A SHARED RESPONSIBILITY

While the CNSC continually strives to be a leader in public communication on nuclear safety, building trust is everyone's responsibility. Industry and licensees must provide information to their stakeholders on their safety record and their nuclear facilities. In December 2013, the CNSC required full implementation of RD/GD-99.3, *Public Information and Disclosure*. These new regulatory requirements put the onus on licensees to proactively inform their public and stakeholders of their facilities' activities, as well as any event or incident that occurs.

With RD/GD-99.3, major regulated facilities in Canada are now required to have robust public information and disclosure programs. The objective is to ensure that information about the health, safety and security of persons and the environment and other issues associated with the lifecycle of a nuclear facility are effectively communicated to the public. CNSC staff have monitored the implementation of RD/GD-99.3, assessing licensees' programs to ensure they meet regulatory requirements. Staff have also begun verifying compliance, by evaluating the implementation of licensees' programs on an annual basis.

## INFORMING AND CONSULTING CANADA'S ABORIGINAL COMMUNITIES

The CNSC is committed to upholding the honour of the Crown through relationship-building and information-sharing, and meeting the CNSC's legal obligations under section 35 of the *Constitution Act, 1982*. The CNSC respects these commitments by informing Aboriginal groups of proposed projects, consulting with potentially impacted Aboriginal groups and encouraging participation throughout environmental assessment and licensing review processes. Aboriginal groups participated in the review of numerous projects in 2013–14, including the proposed Deep Geologic Repository project, the Pickering licence renewal, and the renewal of licences for uranium mine and mill operating facilities in northern Saskatchewan.



Tammy Cook-Searson, chief of the Lac La Ronge Indian Band, intervening at a public hearing (La Ronge, Saskatchewan)

## FUNDING TO ENCOURAGE PUBLIC AND ABORIGINAL PARTICIPATION

The CNSC continued to administer its Participant Funding Program, which was established in 2011 to enhance the participation of the public, Aboriginal peoples and other stakeholders in Commission hearings for major nuclear facilities. This year, \$282,878 in funding was awarded to 20 recipients to participate in Commission hearings on Ontario Power Generation's Pickering Nuclear Generating Station licence renewal, Cameco's Cigar Lake mine licence renewal, Cameco's Beaverlodge decommissioned mine/mill site licence renewal, and Cameco's licence renewal applications for the Key Lake uranium mill, Rabbit Lake uranium mine and mill and McArthur River uranium mine. For 2014–15, funding of \$225,000 has already been offered for participation in four Commission hearings.

## CNSC 101

The CNSC 101 program was launched in 2010, and strives to build public understanding of Canada's nuclear regulatory regime. It does so by delivering information sessions to diverse and engaged public audiences in select locations. During each session, participants have an opportunity to learn and ask questions about the CNSC's role as Canada's nuclear regulator.

The program continues to receive positive feedback from participants, and draws diverse representation from all major stakeholder groups, including the nuclear industry, non-government organizations, academia, government staff, CNSC licensees, Aboriginal groups and the general public. Over the course of the last fiscal year, CNSC 101 sessions were offered in 16 different locations to over 500 participants.





## SPOTLIGHT STORY

# A Rigorous Consultation Process and Stakeholder Feedback for Regulatory Affairs



As a responsible regulator, the Canadian Nuclear Safety Commission (CNSC) recognizes that stakeholder engagement is a critical part of public policy decision-making, and is committed to consulting widely on its regulatory approaches, in a manner that is transparent and fair to all stakeholders.

To achieve these goals, the CNSC shares draft documents simultaneously with all interested stakeholders, and invites anyone interested to comment. All comments received are published, allowing others to further respond publicly to these comments. These “comments on comments” are also published. In this way, interested stakeholders are able to see the

feedback being provided to the CNSC, and to watch the evolution of the CNSC’s regulatory projects.

Input from stakeholders is actively sought, using a variety of vehicles – including announcements on the CNSC’s website, Facebook, and the Government of Canada’s “Consulting with Canadians” website. Notices are also sent to over 2,300 subscribers, including all major licensees, members of the public, NGOs, federal, provincial and territorial governments and international stakeholders.



### Deep Geologic Repository Project

Additional public hearing days announced for the Deep Geologic Repository Project

[Read more](#)



1 2 3 << >> Play



When deemed necessary, the CNSC meets with interested stakeholders to discuss comments received on regulatory documents, to better understand those comments. Final drafts are then shared with stakeholders at least 60 days before Commission meetings or publication.

The CNSC holds frequent public hearings and meetings on our activities, conducted by the independent Commission that examines each application received by licensees. These proceedings – all webcast live, and with the transcripts and webcast archives available on our website – allow the public to learn about nuclear facilities and projects and to intervene in the process. Funding is also available to enhance Aboriginal, public and stakeholder participation in these proceedings. Documents that establish new requirements are presented at public proceedings of the Commission. Further, the tables containing the CNSC’s responses to individual comments are made available as part of the documentation presented to the Commission.

The CNSC takes all stakeholder feedback into account when finalizing its regulatory approach. In cases where diverse viewpoints are presented to the CNSC, additional consultations or meetings may be used to explore the issue and ensure that we understand all points of view. However, in all cases, the CNSC sets requirements in accordance with the best available science and other information, to deliver on its mandate.

The CNSC’s requirements are routinely reviewed, and are aligned, when applicable, with international standards. We encourage interested parties to comment on any of our documents at any time, not just during formal consultation periods.

# COMMISSION MEMBERS



**Mr. Michael Binder**  
*President and Chief Executive Officer, Canadian Nuclear Safety Commission*

Ottawa, Ontario  
Named as a permanent member on January 15, 2008



**Dr. Ronald J. Barriault**  
*Physician, Restigouche Regional Health Authority*

Charlo, New Brunswick  
Named as a permanent member on December 3, 2007



**Mr. André Harvey**

Québec City, Québec  
Named as a permanent member on June 2, 2006



**Dr. J. Moyra J. McDill**  
*Professor Emeritus, Department of Mechanical and Aerospace Engineering, Carleton University*

Ottawa, Ontario  
Named as a permanent member on May 30, 2002



**Dr. Alexander (Sandy) McEwan**  
*Professor and Chair, University of Alberta Cross Cancer Institute*

Edmonton, Alberta  
Named as a permanent member on March 7, 2013



**Mr. Dan Tolgyesi**

Québec City, Québec  
Named as a permanent member on May 30, 2008



**Ms. Rumina Velshi**

Toronto, Ontario  
Named as a permanent member on December 15, 2011



**Dr. James Archibald**  
*Professor of mining engineering, Queen's University, Ontario*

Named as a temporary member on December 1, 2011 to the Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste Joint Review Panel



**Dr. Gunter Muecke**  
*Professional geologist*

Named as a temporary member on December 1, 2011 to the Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste Joint Review Panel



**Dr. Stella Swanson**  
*Environmental consultant*

Named as a temporary member on December 1, 2011, currently Chair of the Deep Geologic Repository for Low- and Intermediate-Level Radioactive Waste Joint Review Panel





# INDEPENDENT AND TRANSPARENT DECISION MAKING

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The CNSC's Commission is central to the functioning of the Canadian Nuclear Safety Commission (CNSC). The Commission makes independent, fair and transparent decisions on the licensing of major nuclear-related activities or facilities. It also establishes legally binding regulations and sets regulatory policy on matters related to the protection of health, safety, security and the environment, and to the implementation of international obligations respecting peaceful uses of nuclear energy.

Before the Commission makes decisions about whether to license nuclear-related activities, it considers applicants' proposals, recommendations from CNSC staff, and stakeholder views. Each decision to license is based on information that demonstrates that the activity or the operation of a given facility can be carried out safely, and that the environment is protected. To promote openness and transparency, the Commission conducts its business where possible in public hearings and meetings and, where appropriate, in communities where activities arise. Aboriginal people and other members of the public can participate in public hearings via written submissions and oral presentations. Commission hearings and meetings

can also be viewed online as webcasts at [nuclearsafety.gc.ca](http://nuclearsafety.gc.ca), and transcripts of public hearings and meetings are also available.

At year-end, the Commission had five permanent members and three temporary members, appointed by the Governor in Council and chosen according to their credentials. All are independent of political, governmental, special interest group or industry influences. Temporary members can be appointed whenever necessary. The CNSC President is the only full-time Commission member.

Under amendments to the *Nuclear Safety and Control Act*, enacted as part of the Government of Canada's *Responsible Resource Development Initiative*, passed in 2012, the maximum term of temporary Commission members has been extended from six months to three years. This will align the terms more closely with the expected timelines for regulatory licensing reviews and environmental assessments for major projects.

# MANAGEMENT DISCUSSION AND ANALYSIS

## CANADIAN NUCLEAR SAFETY COMMISSION

### *Financial Statements for the Year Ending March 31, 2014*

This Management Discussion and Analysis (MD&A) should be read in conjunction with the audited financial statements that follow.

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### PURPOSE

The purpose of this MD&A is to provide management with the opportunity to explain, in narrative form, the CNSC's current financial situation and any significant variances. It is aimed at giving the reader the ability to look at the CNSC's operations through the eyes of management.

### RESULTS OF OPERATIONS

The CNSC's expenses totalled \$149.1 million in 2013–14 down from \$156.0 million a year earlier, for a total decrease of \$6.9 million or 4.4%. A total of \$103.5 million of expenses were paid for by licence fee revenues, while the CNSC's net cost of operations, of slightly more than \$45.6 million, was funded through parliamentary appropriations.

#### Revenues

In 2008–09, the CNSC received authority to spend the revenues it collects through the conduct of regulatory oversight of its fee-paying licensees, and for the conduct of special projects such as nuclear power reactor vendor design reviews. The CNSC collects regulatory

fees in accordance with the *CNSC Cost Recovery Fees Regulations*. In 2013–14 the CNSC funded approximately 69% of its total cost of operations from fees collected from licensees.

Revenues totalled \$103.5 million in 2013–14, down \$6.3 million (5.7%) from \$109.8 million in 2012–13. The decrease is primarily due to:

- decreased level of activity related to power reactors licensing and compliance activities
- decreased level of effort deployed to the conduct of nuclear power reactor vendor design reviews

Those decreases were partially offset by increases in licensing activities for uranium processing facilities and radioactive waste facilities.

### PARLIAMENTARY APPROPRIATIONS

#### Net Cost of Operations

Parliamentary appropriations are used to fund some activities and certain type of licensees which are, by regulations, not subject to cost recovery. The regulations



state that some licensees, such as hospitals and universities, are exempt from paying fees as these entities exist for the public good. In addition, fees are not charged for activities that result from CNSC obligations that do not provide a direct benefit to identifiable licensees. These include activities with respect to Canada's international obligations (including non-proliferation activities), public responsibilities such as emergency management and public information programs, and updating of the *Nuclear Safety and Control Act* (NSCA) and associated regulations, as appropriate.

In 2013–14 the CNSC's net cost of operations funded by Parliamentary appropriation was slightly more than \$45.6 million for a decrease of \$0.6 million over the previous year total.

## Expenses

On an annual basis, the CNSC conducts a planning exercise and approves operating budget levels prior to the start of the fiscal year. Budget approval takes into

account the expected revenues from planned regulatory oversight activities that are subject to cost recovery and the available parliamentary funding.

Total CNSC expenses edged downward to \$149.1 million in 2013–14 from \$156.0 million in 2012–13, for a net decrease of \$6.9 million (4.4%). The decrease in total expenses was mainly caused by:

- actual salary and wage decrease associated with the closure of Hydro Quebec's Gentilly-2 power plant
- net decrease in employee future benefits associated with the Government's decision to modify employees conditions of employment and eliminate the accumulation of severance benefits, and to allow employees to cash-out severance benefits earned to date
- inflated 2012–13 salaries due to union settlement back pay processed in 2012–13





The decreases were partially offset by:

- increase in professional services costs due to the inclusion of the cost of services provided free of charge by Shared Services Canada for the first time in CNSC financial statement expenses
- increase in professional services cost related to the conduct of extended Commission hearings and the upgrade to the system infrastructure to Windows 7 and Office 2010

## OUTLOOK

The outlook for CNSC regulatory oversight requirements will stay stable in the short term, but there are risks of a decline in regulatory requirements over the long term, with announced decommissioning of nuclear power plants in Ontario and uncertainty around the future of the AECL Chalk River facility.

The total projected revenues for 2014–15 are at \$105.2M, slightly lower than anticipated a year ago. The total projected expenses for 2014–15 are \$153.1 million, up \$4.0 million from the \$149.1 million spent in 2013–14. The increase

is due to the accounting of a special one-time net decrease in employee future benefits in 2013–14 which decreased overall expenses in 2013–14.

Over the next two to three years, the CNSC expects several decisions on the life extension of some nuclear power plants, the Chalk River isotope production facility, the construction of new nuclear power reactors, and the creation of deep geological repositories. These decisions will have a material impact on the CNSC's workload and, as a result, the CNSC remains proactive in the implementation of efficiencies and operating improvements, so as to remain nimble and responsive to the regulatory oversight needs of the nuclear industry.

# CNSC MANAGEMENT TEAM



Left to right:

**Jason Cameron**  
*Vice-President,  
Regulatory Affairs,  
and Chief  
Communications  
Officer*

**Jacques Lavoie**  
*Senior General  
Counsel and  
Director of  
Legal Services*

**Michael Binder**  
*President and  
Chief Executive  
Officer*

**Stéphane Cyr**  
*Vice-President,  
Corporate Services,  
and Chief  
Financial Officer*

**Ramzi Jammal**  
*Executive  
Vice-President,  
Regulatory  
Operations, and  
Chief Regulatory  
Operations Officer*

**Terry Jamieson**  
*Vice-President,  
Technical Support*

**Marc Leblanc**  
*Commission  
Secretary*

# ANNEXES

## ANNEX A – COMMISSION HEARINGS AND OPPORTUNITIES TO BE HEARD

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### HEARINGS

#### Nuclear power plants

##### **Bruce Power Inc.:**

- Decision to amend the Bruce Nuclear Generating Station A and Station B power reactor operating licence – Abridged hearing (January 23, 2014)

##### **New Brunswick Power Nuclear Corporation:**

- Decision to transfer the power reactor operating licence from New Brunswick Power Nuclear Corporation to New Brunswick Power Corporation, for the Point Lepreau Nuclear Facility located in the Lepreau Peninsula, New Brunswick – Abridged hearing (September 6, 2013)
- Decision to accept the requested modifications to the fund agreements listed in the financial guarantees for the Point Lepreau Nuclear Generating Station – Abridged hearing (November 15, 2013)

##### **Ontario Power Generation Inc.:**

- Decision to issue a licence to abandon for the Bruce Heavy Water Plant – Public hearing – Abridged hearing (February 3, 2014)
- Decision to renew the power reactor operating licence for the Pickering Nuclear Generating Station – Public hearing (February 20 and May 29 to 31, 2013)

##### **University of Alberta:**

- Decision to renew the non-power reactor operating licence for the SLOWPOKE-2 reactor – Public hearing (May 15, 2013)

##### **Saskatchewan Research Council:**

- Decision to accept the request for exemption from the CNSC *Cost Recovery Fees Regulations* for the SLOWPOKE-2 Reactor – Abridged hearing (April 30, 2013)
- Decision to renew the non-power reactor operating licence for the SLOWPOKE-2 reactor – Public hearing (May 15, 2013)



### **Royal Military College of Canada:**

- Decision to renew the non-power reactor operating licence for the SLOWPOKE-2 reactor – Public hearing (May 15, 2013)

### **École Polytechnique de Montréal:**

- Decision to renew the non-power reactor operating licence – Public hearing (May 15, 2013)

### **Shield Source Inc.:**

- Decision to renew the nuclear substance processing facility operating licence – Abridged hearing (December 23, 2013)
- Decision to replace the nuclear substance processing facility operating licence with a licence to abandon the Shield Source Incorporated nuclear substance processing facility – Abridged hearing (March 28, 2014)

## **URANIUM MINES AND MILLS**

### **Cameco Corporation:**

- Decision to issue a uranium mine construction licence and to authorize construction and operation of Cameco's Cigar Lake Project – Public hearing (April 3, 2013)
- Decision to renew the waste facility operating licence at the decommissioned Beaverlodge Mine and Mill Site – Public hearing (April 3-4, 2013)
- Decision to renew the uranium mine operating licence for the McArthur River Operation – Public hearing (October 1, 2 and 3, 2014)
- Decision to renew the uranium mine licence for the Rabbit Lake Operation – Public hearing (October 1, 2 and 3, 2014)

- Decision to renew the uranium mine licence for the Key Lake operation – Public hearing (October 1, 2 and 3, 2014)

## **Processing and research facilities**

### **AECL:**

- Decision to approve the operation of the fuel packaging and storage facility – Abridged hearing (March 18, 2014)
- Decision to accept the request for an exemption from the requirements of sections 15.01 and 15.02 of the CNSC *Class II Nuclear Facilities and Prescribed Equipment Regulations* – Abridged hearing (September 30, 2013)

## **MEETINGS**

### **Opportunities to be heard**

#### **Western Inspection Ltd.:**

- Decision to revoke the designated officer order issued on April 5, 2013 – Abridged hearing (May 3, 2013)

### **Notice of Public Participation at a Commission Meeting**

- The public was invited to participate, in writing, on *CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants for 2012 (2012 NPP Report)* – Commission Meeting (August 21–22, 2013)
- The public was invited to participate, in writing, on *CNSC Staff Report on the Performance of Canadian Uranium Fuel Cycle and Processing Facilities: 2012 (CNSC Staff Report)* – Commission Meeting (December 10–11, 2013)

# ANNEX B – REGULATORY FRAMEWORK PROJECTS PUBLISHED/COMPLETED IN 2013–14

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## **REGDOC-2.12.1, *High-Security Sites: Nuclear Response Force***

In October 2013, REGDOC-2.12.1, *High-Security Sites: Nuclear Response Force*, was published; it sets out the CNSC's expectations with respect to the minimum requirements for establishing, equipping, training, testing and deploying an onsite nuclear response force (NRF). The document applies to all persons whom the licensee is considering to train and authorize as NRF members. REGDOC-2.12.1 incorporates an updated NRF training plan, firearms qualifications and modern practices.

This regulatory document also describes the application process for licensees to request authorization for an NRF member to be designated as a CNSC-sponsored public agent, in order to possess and have access to firearms, prohibited weapons, prohibited devices, prohibited ammunition or restricted weapons, for the purpose of carrying out his or her duties at a licensed high-security nuclear site.

REGDOC-2.12.1 supersedes RD-298, *Nuclear Response Force*.

## **REGDOC-2.12.2, *Site Access Security Clearance***

In April 2013, REGDOC-2.12.2, *Site Access Security Clearance* was published; it provides guidance regarding the process for granting a site access security clearance (SASC) for authorized unescorted entry to a protected area.

The SASC process helps ensure that unescorted persons entering protected areas would not pose a risk to facilities, their operation or personnel.

## **REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources***

In May 2013, REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* was published; it sets out the minimum security measures required to prevent the loss, sabotage, illegal use, illegal possession, or illegal removal of sealed sources while they are in storage at the site of a licensed activity, in transport or being stored during transportation. This document includes measures for both technical and administrative physical security. It also sets out the minimum security measures that a licensee must ensure a carrier of sealed sources meets. This document also provides information and guidance on how to meet the security requirements.

## **REGDOC-2.3.2, *Accident Management: Severe Accident Management Programs for Nuclear Reactors***

In September 2013, REGDOC-2.3.2, *Accident Management: Severe Accident Management Programs for Nuclear Reactors* was published; it sets out expectations and guidance with respect to severe accident management programs. REGDOC-2.3.2 supersedes the previous version, identified as G-306, *Severe Accident Management Programs for Nuclear Reactors*. It includes amendments to reflect lessons learned from the Fukushima nuclear event of March 2011, and addresses findings from the *CNSC Fukushima Task Force Report*, as applicable to G-306.

### **REGDOC-2.6.3, *Aging Management***

In March 2014, REGDOC-2.6.3, *Aging Management*, was published; it sets out requirements and guidance for the appropriate and proactive management of aging throughout the different phases of a power reactor facility's lifecycle. This document provides a framework within which codes and standards can be applied so that physical aging and obsolescence of structures, systems and components important to safety are effectively managed.

This document replaces RD-334, *Aging Management for Nuclear Power Plants*, which was published in June 2011.

### **REGDOC-2.9.1, *Environmental Protection: Policies, Programs and Procedures***

In September 2013, REGDOC-2.9.1, *Environmental Protection: Policies, Programs and Procedures*, was published; it helps licensees implement environmental protection policies, programs and procedures at Class I nuclear facilities and uranium mines and mills.

This document combines the information from and supersedes two other documents: S-296, *Environmental Protection Policies, Programs and Procedures at Class I Nuclear Facilities and Uranium Mines and Mills*, and G-296, *Developing Environmental Protection Policies, Programs and Procedures at Class I Nuclear Facilities and Uranium Mines and Mills*.

This document amends the guidance to reflect lessons learned from the Fukushima Daiichi nuclear event of March 2011, and addresses findings from the *CNSC Fukushima Task Force Report*.

### **REGDOC-3.5.2, *Compliance and Enforcement: Administrative Monetary Penalties***

In March 2014, REGDOC-3.5.2 was published; it complements the *Administrative Monetary Penalties Regulations* that came into force on July 3, 2013. This information document provides an overview of how and where AMPs fit into the CNSC's approach to graduated enforcement, and describes how penalty amounts are calculated.

### **DIS-13-01, *Proposals to Amend the Radiation Protection Regulations***

In August 2013, the CNSC published a discussion paper seeking feedback from licensees, the Canadian public and other interested stakeholders on proposed amendments to the regulations, including new requirements for radiation detection and measurement instrumentation, and responsibility for radiation protection.

These amendments would harmonize regulations with updated international standards and clarify requirements, and address gaps identified in light of the nuclear incident at the Fukushima Daiichi nuclear power plant in Japan. Feedback received from these consultations will be analyzed and considered as CNSC staff finalize their recommendations for the Commission's and Governor in Council's consideration.

### **DIS-13-02, *Proposed Amendments Made to Regulations under the Canadian Nuclear Safety and Control Act***

In November 2013, the CNSC published a discussion paper seeking feedback from licensees, the Canadian public and other interested stakeholders on proposed amendments to several CNSC regulations, including the *Class I Nuclear Facilities Regulations*, the *Class II Nuclear Facilities and Prescribed Equipment Regulations*, the *General Nuclear Safety and Control Regulations*, the *Nuclear Substances and Radiation Devices Regulations*, and the *Uranium Mines and Mills Regulations*, as well as the *Canadian Nuclear Safety Commission Rules of Procedure*.

These amendments are proposed in part to respond to recommendations made by the CNSC Fukushima Task Force, while other changes are proposed to help further strengthen and clarify the CNSC's regulatory framework. Feedback received from these consultations will be analyzed and considered as CNSC staff finalize their recommendations for the Commission's and Governor-in-Council consideration.



# ANNEX C – CNSC ORDERS AND ADMINISTRATIVE MONETARY PENALTIES ISSUED TO LICENSEES IN 2013–14

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## ORDERS

### **Date issued: April 5, 2013**

**Date resolved:** June 12, 2013 (revoked)

**Licensee:** Western Inspection Ltd.

**Issue:** The order required the company to immediately cease all industrial radiography operations and return all of its exposure devices to secure storage. The company was required to provide its workers with training on the conduct of radiography operations to the satisfaction of the CNSC, and provide the CNSC with measures the company would take to prevent the reoccurrence of similar unsafe operations.

### **Date issued: April 19, 2013**

**Date resolved:** June 19, 2013

**Licensee:** Curtis Engineering Associates Ltd.

**Issue:** The order required the company to remove a specific worker from the transport of portable nuclear gauges until the company provided the worker with adequate training to safely perform transport-related activities.

### **Date issued: May 9, 2013**

**Date resolved:** March 20, 2014

**Licensee:** 527979 Alberta Ltd.

**Issue:** The order required the company to relocate its exposure devices to a location that will provide security measures acceptable to the CNSC. The licensee subsequently ceased operations, and the radioactive sources were transferred and disposed appropriately.

### **Date issued: June 4, 2013**

**Date resolved:** July 15, 2013

**Licensee:** Red River Equipment (2007) Inc.

**Issue:** The order required the company to immediately secure a specific nuclear gauge in its facility, to prevent unauthorized access to the device. The company was required to transfer the gauge by June 14, 2013 to a person authorized by the CNSC to possess such a device, and provide evidence to the satisfaction of the CNSC that the transfer had taken place. On July 15, 2013, the CNSC took possession of the nuclear gauge, ensuring that there was no unreasonable risk to the health and safety of workers, the public and the environment.

### **Date issued: July 4, 2013**

**Date resolved:** November 1, 2013

**Licensee:** NOVA Chemicals Corporation

**Issue:** The order required NOVA Chemicals Corporation to immediately cease all operations of the nuclear gauges located at its site. The company was required to implement an effective radiation protection program, satisfactory to the CNSC, before it would be permitted to resume operating the nuclear gauges.

### **Date issued: August 15, 2013**

**Date resolved:** August 27, 2013

**Licensee:** Soil Probe Ltd.

**Issue:** The order required the company to immediately place all of its portable nuclear gauges in secure storage and remove all of its workers from the operation of the gauges until the company provided the workers with adequate training to safely operate portable nuclear gauges. Soil Probe Ltd. is also required to correct, to the satisfaction of the CNSC, all items of non-compliance observed during the inspection.

**Date issued: August 20, 2013**

**Date resolved:** August 28, 2013

**Licensee:** LVM Inc.

**Issue:** The order required the company to remove a specific worker from operating a portable nuclear gauge until it provided the worker with adequate training to safely operate such device.

**Date issued: August 28, 2013**

**Date resolved:** April 17, 2014

**Licensee:** City of Estevan

**Issue:** The order required the city to immediately place its portable nuclear gauge in secure storage and remove all of its workers from the operation of the gauge until the city had demonstrated that an effective radiation protection program had been implemented. The city was also required to correct, to the satisfaction of the CNSC, all items of non-compliance observed during the inspection.

**Date issued: September 5, 2013**

**Date resolved:** October 24, 2013

**Licensee:** Parkland Geotechnical Consulting Ltd.

**Issue:** The order required the company to immediately place its portable nuclear gauges in secure storage and correct, to the satisfaction of the CNSC, all items of non-compliance observed during the last inspection. The licensee was to also remove all workers from operation of the gauges at this location, until it demonstrated that an effective radiation protection program had been implemented and that workers had been provided with adequate training to safely operate portable nuclear gauges.

**Date issued: September 6, 2013**

**Date resolved:** November 5, 2013

**Licensee:** GEM Testing Ltd.

**Issue:** The order required the company to immediately prohibit two of its workers from transporting portable nuclear gauges until it could be demonstrated to the satisfaction of the CNSC that these workers had been effectively retrained in the proper transport of radioactive devices and packages.

**Date issued: September 16, 2013**

**Date resolved:** Unresolved as of March 31, 2014

**Licensee:** WSA Engineering Limited

**Issue:** The order required the company to immediately cease the use and transport of its portable nuclear gauges until it could be demonstrated to the CNSC that the company had the required qualifications and knowledge to implement and maintain an effective radiation protection program.

**Date issued: September 17, 2013**

**Date resolved:** October 30, 2013

**Licensee:** P. Machibroda Engineering Ltd.

**Issue:** The order required the company to immediately remove one of its workers from activities involving portable nuclear gauges until it could be demonstrated to the satisfaction of the CNSC that this worker had been effectively retrained in all aspects of the safe operation of portable nuclear gauges. The licensee was also required to correct, to the satisfaction of the CNSC, all items of non-compliance identified during the last inspection.

**Date issued: September 21, 2013**

**Date resolved:** October 10, 2013

**Licensee:** Groupe Qualitas Inc.

**Issue:** The CNSC issued the order as a result of observations made during a field inspection in Laval, Québec. The inspection identified that a worker left a portable nuclear gauge unattended, on two occasions. The order required Groupe Qualitas Inc. to have the worker immediately stop using the device until the person has been retrained and qualified by the company to work with portable nuclear gauges. The CNSC required the untrained worker to be removed from duty, to prevent any risk to the health and safety of the worker, as well as to the public and the environment.

**Date issued: October 2, 2013**

**Date resolved:** November 5, 2013

**Licensee:** Labo S.M. Inc.

**Issue:** The CNSC issued the order following a television report that aired on TVA on October 1, 2013. The report showed a technician handling a portable nuclear gauge in an unsafe manner. Labo S.M. Inc. confirmed to the CNSC that the technician was one of their own, and that the incident took place on the day of the television report.

The order required the employee in question to cease using the device immediately and to refrain from using it until Labo S.M. Inc. had given him the necessary training and was certain of his competence.

**Date issued: October 18, 2013**

**Date resolved:** February 6, 2014

**Licensee:** Candec Engineering Consultants Inc.

**Issue:** The order required the company to provide details of corrective actions taken to adequately address non-compliances observed during the last inspection, and to pay their licensing fees in full by November 1, 2013; or to cease all operations with portable nuclear gauges, and place them in secure storage.

**Date issued: November 13, 2013**

**Date resolved:** December 17, 2013

**Licensee:** Genfir Inc.

**Issue:** The order required the company to cease using or handling the gauge located at their Ange-Gardien, Quebec, site until all items of non-compliance identified during the last inspection had been corrected to the CNSC's satisfaction.

**Date issued: February 20, 2014**

**Date resolved:** Unresolved as of March 31, 2014

**Licensee:** Breton N.D. Testing Incorporated

**Issue:** The order required the company to remove a specific worker from duties related to the operation of exposure devices, until the worker no longer posed a risk to the health and safety of persons.

**Date issued: March 17, 2014**

**Date resolved:** Unresolved as of March 31, 2014

**Licensee:** Anode NDT Ltd.

**Issue:** The order required the company to remove one of its workers from duties related to the supervision of exposure device operator trainees, until the worker can perform this role without posing an unreasonable risk to the health and safety of persons.

## ADMINISTRATIVE MONETARY PENALTIES

**Date issued: November 14, 2013**

**Status at March 31, 2014:** AMP remains unpaid

**Licensee:** Red River Equipment

**Amount:** \$14,860

**Issue:** Issued as a result of the company's failure to comply with a CNSC order of June 4, 2013.

**Date issued: December 10, 2013**

**Date resolved:** December 24, 2013

**Licensee:** Mr. Bradley Hibbard, P. Machibroda Engineering Ltd.

**Amount:** \$300

**Issue:** Issued as a result of the licensee's failure to comply with paragraph 17(b) of the *General Nuclear Safety and Control Regulations*. This followed an order issued to P. Machibroda Engineering Ltd. on September 24, 2013 requiring Mr. Hibbard to be removed from activities involving portable nuclear gauges and be retrained in all aspects of the safe operation of said gauges. On October 30, 2013, the CNSC confirmed that P. Machibroda Engineering Ltd. had complied with all the terms and conditions of the order.

**Date issued: January 29, 2014**

**Date resolved:** April 9, 2014

**Licensee:** Mr. Frédéric Dulude, Labo S.M. Inc.

**Amount:** \$591

**Issue:** Issued as a result of the licensee's failure to comply with paragraph 17(b) of the *General Nuclear Safety and Control Regulations*. This followed an order issued to Labo S.M. Inc. on October 2, 2013 requiring Mr. Dulude to cease using a portable nuclear gauge immediately, and that he refrain from using it until Labo S.M. Inc. had given him the necessary training and was certain of his competence. On November 5, 2013, the CNSC confirmed that Labo S.M. Inc. had complied with all the terms and conditions of the order.



# ANNEX D – CNSC STAKEHOLDER ENGAGEMENT ACTIVITIES

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As an unbiased scientific expert in the nuclear field, the Canadian Nuclear Safety Commission (CNSC) is often asked to take part in outreach activities such as classroom presentations, conferences, and special events. The dissemination of technical, scientific, and regulatory information on nuclear activities is part of our mandate and a key function of this work is in how we reach out to – and engage – our stakeholders.

In 2013–14, the CNSC confirmed outreach and engagement as an organizational priority, and developed and implemented a strategy to participate in many available outreach opportunities. These outreach activities are meant to demystify nuclear science, describe our role as Canada’s nuclear regulator and bring a CNSC face into communities across the country. To deliver on these activities, staff from across the organization – experts in the fields of nuclear science and safety – have committed to participate.

## Overview of the CNSC’s outreach activities in 2013–14

150 outreach activities were completed in this past year. These included:

- 9 youth-related events
- 6 waste-related events
- 31 events that focused on CNSC licensees directly
- 33 events that focused on communities with nuclear facilities
- 5 that were related to environmental issues
- 3 medical-related events

The following are additional details on some specific outreach activities of particular note.



Students participating in open house where staff discussed CNSC’s role and our early involvement in a deep geological repository for used nuclear fuel (Hornepayne, Ontario)

CNSC 101 session location	number of participants
University of Winnipeg (Winnipeg, MB)	11
Winnipeg, MB	17
Sherbrooke, QC	17
CNSC Student Orientation Session (Ottawa, ON)	27
Saskatoon, SK	36
Northlands College (La Ronge, SK)	50
La Ronge, SK	20
Durham College (Oshawa, ON)	53
Oshawa, ON	40
Port Hope Chamber of Commerce (Port Hope, ON)	14
AECL Lunch and Learn (Deep River, ON)	26
Deep River, ON	18
Ottawa, ON	48
University of Ontario Institute of Technology (Oshawa, ON)	85
Hamilton, ON	28
Michener Institute (Toronto, ON)	12
<b>Total</b>	<b>502</b>

## CNSC 101

The CNSC 101 program was launched in 2010 and strives to build public confidence in Canada's nuclear regulatory regime. It does so by delivering information sessions to diverse and engaged public audiences in selected locations.

## EMERGENCY PREPAREDNESS WORKSHOPS

The CNSC, Health Canada and Public Safety Canada jointly sponsored two national nuclear emergency preparedness workshops (one in Ontario and one in New Brunswick) in March 2013, to engage stakeholders and achieve a common understanding of roles, responsibilities and capabilities when responding to a severe nuclear accident.

## THE NUCLEAR WASTE MANAGEMENT ORGANIZATION'S DEEP GEOLOGIC REPOSITORY FOR USED NUCLEAR FUEL

As part of the Nuclear Waste Management Organization's process to identify an informed and willing community

to host a deep geologic repository for Canada's used nuclear fuel, the CNSC met with the communities of Elliot Lake, the North Shore, Blind River and Spanish, and the South Bruce Community Liaison Committee. The CNSC also conducted two open houses in the Ontario communities of Ignace and Ear Falls.

## CONFERENCES HELD TO ADVANCE NUCLEAR SCIENCE

The CNSC hosted several international and domestic workshops and seminars this past year. Some of the most notable include the international seminar on probabilistic leak-before-break methodologies for nuclear applications, a seminar on the historical development of seismic design plus wind flood loading and design, a special presentation on the summary of activities at the Centre for Nuclear Energy Facilities and Structures, and seismic re-evaluation and probabilistic methods in establishing reliability of structures, systems and components.

## NEW PUBLICATIONS

The CNSC publishes a wide range of documents such as regulatory and licensing process documents for licensees, annual reports and information products. The following documents were published in 2013–14:

***CNSC Staff Report on the Performance of Canadian Uranium Fuel Cycle and Processing Facilities: 2011***

***National Sealed Source Registry and Sealed Source Tracking System - Annual Report 2012***

***CNSC Integrated Action Plan On the Lessons Learned From the Fukushima Daiichi Nuclear Accident***

***Canadian National Report for the Convention on Nuclear Safety: Sixth Report, August 2013***

***Radiation and Incidence of Cancer Around Ontario Nuclear Power Plants From 1990 to 2008 (The RADICON Study) Summary Report***

***CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants for 2012***

***Canadian Nuclear Safety Commission Annual Report 2012–2013***

***Environmental Fate of Tritium in Soil and Vegetation***

***Reports on Plans and Priorities: 2014–15***

***Nuclear Substances in Canada: A Safety Performance Report for 2012***

All CNSC publications can be found on our website.

## CNSC ONLINE MODULES

We continued to expand our content for CNSC Online, an interactive learning tool using an animated, interactive interface that provides an overview of nuclear regulation in Canada and focuses on the CNSC's role in ensuring safety. In 2013–14, we produced the following new modules:

**Fact or Fiction: Cancer Clinics**

**Fact or Fiction: Cyclotrons**

**Fact or Fiction: Isotopes**

**Fact or Fiction: Radiation History**

**Fact or Fiction: Radiation Around you**

**Fact or Fiction: HEU transport**

**Is it Ionizing? Quiz game**

**The Safe Transport of Liquid HEU**

**Radiation Dose Game**

**Radioactive Me poster**

## VIDEOS

With the increasing use of video, the CNSC released a host of new videos (42 produced in 2013–14) and featured them on its website and YouTube channel. The channel features playlists based on topics of interest, including both CNSC and third-party content.



# NUCLEARSAFETY.GC.CA

## VISIT THE CNSC'S WEBSITE FOR MORE INFORMATION ABOUT THE CANADIAN NUCLEAR SECTOR

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### On the CNSC's website, you'll find:

- more about the CNSC and its role in nuclear safety
- links to laws and regulations governing Canada's nuclear sector
- information about nuclear facilities in Canadian communities
- news releases and updates on important issues affecting the nuclear sector
- fact sheets on nuclear-related topics
- how to get involved in public hearings or environmental assessments
- CNSC publications and reports
- information bulletins about regulatory documents

### Visit the website and subscribe to receive email notifications about:

- Commission decisions, hearing documents, meeting notices and agendas
- news releases
- regulatory document comment periods and updates
- presentations
- website updates

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