



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

CANADIAN NUCLEAR
SAFETY COMMISSION
ANNUAL REPORT 2014–15

REGULATING NUCLEAR SAFETY IN CANADA



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, transportation of radiological substances, 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.

VISION

To be the best nuclear regulator in the world.

MISSION

To regulate the use of nuclear energy and materials to protect health, safety and 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.

LETTER TO THE MINISTER

THE HONOURABLE JIM CARR
MINISTER OF NATURAL RESOURCES
OTTAWA, ONTARIO

Sir:

I have the honour of presenting you with the Canadian Nuclear Safety Commission's Annual Report for the fiscal year ending March 31, 2015. The report has been prepared and tabled 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 a pleasure to present the Canadian Nuclear Safety Commission (CNSC) Annual Report for 2014–15, with the theme of regulating nuclear safety in Canada. Our work – from licensing to compliance of nuclear activities, to maintaining and developing regulatory instruments and engaging stakeholders – involves a wealth of complex efforts necessary for an effective, successful regulatory regime.

In the past year, the Commission held public hearings for several major facilities and its decisions included the lifting of a hold point on the Pickering Nuclear Generating Station licence, which allowed the licensee to extend the operating life of its pressure tubes. The Commission also held the first part of a public hearing to renew the operating licence for the Bruce A and B Nuclear Generating Stations. Staff have been doing extensive work in preparation for the public hearings that will take place in the upcoming year on the refurbishment and licence renewal of the Darlington Nuclear Generating Station.

The work of the joint review panel to consider the proposed Deep Geologic Repository Project for Low- and Intermediate-Level Radioactive Waste was largely completed during the past year. Our staff provided extensive support to the panel, which submitted its report to the Minister of the Environment in May 2015. Should the Minister accept the panel's recommendations, the project will move to the licensing phase.

I am very proud of our organization's international efforts. These include the continuing review of lessons learned from the Fukushima nuclear accident, preparation for the implementation of the Canada–India appropriate arrangement, and contributions to leading international peer reviews to India and the United Arab Emirates, aimed at strengthening global nuclear safety.



On the national scene, we continue to place great emphasis on emergency preparedness management. We were a key player in Exercise Unified Response, a major emergency exercise that simulated a severe accident at a nuclear generating station. We also established new requirements for the pre-distribution of potassium iodide pills near nuclear generating stations. It is one of the many steps we have taken since Fukushima to further enhance emergency preparedness and to ensure that Canadians are adequately prepared for any accident scenario, however unlikely.

In addition to these large initiatives and special projects, the bulk of our day-to-day work entails oversight of nearly 2,000 licensees, to ensure the continued safety of all nuclear activities in Canada. Our ongoing efforts and commitment to safety are reflected in the Canadian nuclear industry's excellent safety record. Our goal is to maintain this success as we continue to strive toward being the best nuclear regulator in the world.

A handwritten signature in black ink that reads "M. Binder". The signature is written in a cursive, flowing style.

Michael Binder

CNSC AT A GLANCE

WHO WE ARE

The Canadian Nuclear Safety Commission regulates all nuclear facilities and activities in Canada – known as the nuclear fuel cycle.

WHAT IS THE NUCLEAR FUEL CYCLE?

Nuclear safety means protecting Canadians at every stage in the nuclear fuel cycle – not just monitoring nuclear power stations. The CNSC regulates the entire process, from uranium mining, the collection of nuclear by-products for use in nuclear medicine

and research, to the management and disposal of nuclear waste. We also monitor for environmental impacts from nuclear activities, and our nation’s nuclear security and international commitments.



CNSC REGULATES	
	URANIUM MINES AND MILLS
	NUCLEAR PROCESSING AND RESEARCH
	NUCLEAR POWER GENERATION
	NUCLEAR MEDICINE
	NUCLEAR SUBSTANCES AND TRANSPORTATION
	WASTE MANAGEMENT
	THE ENVIRONMENT
	NATIONAL SECURITY & INTERNATIONAL COMMITMENTS

WHERE WE WORK



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

HOW WE WORK

The CNSC is Canada's nuclear regulator. It is comprised of a Commission tribunal that is completely independent and is supported by a highly skilled, professional staff who are

dedicated and committed to protecting the health, safety, and security of Canadians and the environment with respect to all types of permitted nuclear activity.



CNSC – OVERVIEW

A REGULATORY AND OVERSIGHT ROLE

Under the *Nuclear Safety and Control Act* (NSCA), the Canadian Nuclear Safety Commission (CNSC) regulates all nuclear-related activities in Canada and establishes technical requirements for them.

Those wishing to carry out activities regulated under the NSCA must first obtain a licence or a certification from the CNSC.

The CNSC provides clarity on regulatory expectations and oversees licensed activities to ensure regulatory requirements are met. The Commission is the CNSC's decision-making body and makes licensing decisions for all major nuclear facilities in Canada.

CNSC staff participate in many national and international technical projects and meetings to contribute to the safe and secure regulation of nuclear facilities and activities in Canada and around the world. These projects and meetings address areas ranging from the design of new nuclear reactors, aging facilities decommissioning and waste management 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 Audit Committee and the Evaluation Committee. The Audit Committee which serves as an advisory body to the president (with three external and two internal members) reinforces the effectiveness of internal audits, and oversees key areas and processes such as risk management, management control, accountability reporting, and values and ethics. The 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 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, to keep the public safe, to protect the environment and to minimize consequences in case of a severe accident. 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

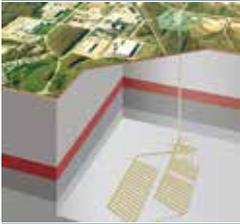
The CNSC makes safety its number-one priority and requires licensees to do the same. This includes being prepared to respond to events and emergencies, as well as continually evaluating and improving emergency response capabilities.

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 programs 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 internal 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 it does.

KEY ACHIEVEMENTS

	<p style="text-align: center;">Licensing major facilities</p> <ul style="list-style-type: none"> public hearing held in early 2015 for renewal of the power reactor operating licences for the Bruce A and B Nuclear Generating Stations Ontario Power Generation granted permission by the Commission to proceed with Pickering Nuclear Generating Station (NGS) operation up to 247,000 effective full-power hours (EFPH), up from 210,000 EFPH 	<p style="text-align: center;">Commission</p> <p>5 public hearings 129 intervenors 21 abridged hearings 8 public meetings 16 intervenors</p>
	<p style="text-align: center;">Supporting the Joint Review Panel for Ontario Power Generation's Deep Geologic Repository</p> <ul style="list-style-type: none"> proposed underground facility for low- and intermediate-level radioactive waste at the Bruce site, Tiverton, Ontario joint review panel (JRP) submitted environmental assessment report with recommendations to Minister of the Environment in May 2015; based on additional input from 8 days of public hearings and 69 submissions in Kincardine, Ontario 	<p style="text-align: center;">Deep Geologic Repository</p> <p>200,000 m³ of radioactive waste 680 m deep in limestone</p>
	<p style="text-align: center;">Participating in Exercise Unified Response</p> <ul style="list-style-type: none"> largest national multi-jurisdictional exercise: Exercise Unified Response simulated severe accident at the Darlington NGS to enable emergency organizations to test their response capability successfully demonstrated the ability to protect the public, infrastructure and the environment strengthened CNSC, U.S. Nuclear Regulatory Commission (U.S. NRC) and International Atomic Energy Agency relationships 	<p style="text-align: center;">The exercise</p> <p>3 days long 12 months prep. 50 organizations 2000 participants</p>
	<p style="text-align: center;">Extending financial guarantee program</p> <ul style="list-style-type: none"> licensees using nuclear substances, prescribed equipment and Class II facilities must provide a valid financial instrument as of April 1, 2015 tangible commitment by a licensee that there will be sufficient resources to safely terminate licensed activities 	<p style="text-align: center;">Financial guarantees</p> <p>Average cost per licensee – \$58/year</p>
<p style="text-align: center;">Core licensing, compliance and verification activities</p> <ul style="list-style-type: none"> issued 535 export and 167 import licences for nuclear substances, prescribed equipment and information, as well as 254 export licences issued for risk-significant radioactive sources issued 155 new transport licences, revised 37 transport licences and 41 transport certificates for package design and for special-form radioactive material issued 12 new certificates and revised 55 certificates for radiation devices and other prescribed equipment conducted 1,687 inspections and 2,906 desktop reviews and annual compliance report verifications, relative to nearly 2,500 licences held by just over 1,700 licensees managed 3,271 CNSC certificates held by persons across Canada who are key operating personnel for both power and research reactors; health physicists and radiation safety officers; and industrial radiography exposure device operators issued 12 orders to specific licensees using nuclear substances and 12 administrative monetary penalties 		<p style="text-align: center;">Research and Support Program</p> <p>\$3.7 million on 40 projects, up \$950,000 from previous year 30 contributions and 14 grants Staff prepared 19 technical papers and 7 peer-reviewed journal articles</p>



TRANSPARENCY: A NECESSARY REQUIREMENT FOR MODERN REGULATORS

With a mandate to disseminate objective scientific, technical and regulatory information to the public, the CNSC goes to great lengths to ensure that it is being open and transparent in all of its dealings.

This approach is important for increasing public understanding and trust in the CNSC's role of protecting Canadians, their health and the environment.

The CNSC also believes that establishing an atmosphere of openness with the public should be a key priority for all national nuclear regulators, and that transparency and proactive communications are a shared responsibility among regulators, facility operators and international

organizations involved in nuclear safety and security.

Since the Fukushima Daiichi nuclear accident, the CNSC has enhanced its communications with the public, required all major facility operators to formalize their public information and disclosure programs, and advocated for greater transparency internationally. It takes every opportunity to encourage other nuclear regulators and international organizations involved in nuclear safety to share information with the public.

For instance, before the most recent review meeting of the *Convention on Nuclear Safety*¹, the CNSC shared

¹ The *Convention on Nuclear Safety* is a 1994 International Atomic Energy Agency treaty that governs safety rules at nuclear power plants in state parties to the Convention.

The Convention creates obligations on state parties to implement certain safety rules and standards at all civil facilities related to nuclear energy. These include issues of site selection, design and construction, operation and safety verification, and emergency preparedness.

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Canada's national report, as well as the questions and answers arising from the peer-review process. Canada was the only country to do so and invited other countries to share similar information. The CNSC also asked the Convention's President to name regulators of countries that do not comply with their obligations under the Convention. In addition, it urged regulators to publish the International Atomic Energy Agency's peer-review mission reports as well as the actions taken to respond to recommendations and suggestions.

CONSULTING BROADLY ON PROPOSED NEW REGULATORY REQUIREMENTS

When proposing new or revising existing regulatory requirements, the CNSC actively seeks input from licensees, the public, non-governmental organizations, all levels of government, and international stakeholders. A variety of vehicles – including website

announcements, Facebook postings and email distribution lists – are used to solicit this feedback. The CNSC considers all input when finalizing its regulatory requirements.

When opinions differ, the CNSC may also provide opportunities for additional consultation to explore remaining issues and ensure that all points of view are understood and given serious consideration. In all cases, the CNSC carries out its mandate using requirements based on the best science available.

ENSURING INDEPENDENT, TRANSPARENT DECISIONS

The Commission – the CNSC's decision-making body for major nuclear facilities – promotes openness and transparency by conducting public hearings and meetings. When possible, these proceedings are held where nuclear facilities are located. This ensures that the

public most directly implicated by the matter at hand will have a voice in the decision-making process.

Aboriginal people, as well as other members of the public, participate in public hearings via written submissions and oral presentations. The CNSC's Participant Funding Program, established in 2011, enhances public participation in the environmental assessment and licensing process and helps participants give valuable information to the Commission. The public proceedings are carried live online at nuclearsafety.gc.ca, and transcripts are made available online shortly afterwards.

ACTIVELY ENGAGING AND CONSULTING WITH THE PUBLIC

Travelling throughout the country, CNSC staff regularly visit Canadians in their communities to answer their questions on nuclear regulation. Between April 2014 and March 2015, the CNSC participated in over 160 outreach activities.

The CNSC encourages its experts to share their knowledge, and many of their technical articles have been peer-reviewed and published in various scientific journals. Scientific and technical paper abstracts, as well as journal articles, are also published on the CNSC website.

REGULATORY REQUIREMENTS FOR PUBLIC INFORMATION PROGRAMS

While the CNSC continually strives to be a leader in public communication on nuclear safety, it is also the industry's responsibility to build trust. Licensees must provide information on their safety

records and nuclear activities to their stakeholders and people living near their facilities.

This industry's responsibility to communicate was formalized in 2013, when the CNSC implemented new regulatory requirements outlined in RD/GD-99.3, *Public Information and Disclosure*. These requirements put the onus on licensees to define their targeted audiences and to proactively inform them and stakeholders of the facilities' regular activities as well as any accidents.

Under RD/GD-99.3, these requirements are now implemented through robust public information programs at regulated facilities. These programs are supported by disclosure protocols, which must describe the type of information or reports to be made public, as well as the criteria for determining when and where such information and reports are to be published.

The CNSC expects licensee-managed public information programs to work towards building public awareness and understanding of their nuclear activities. Developing and maintaining open communication channels, and sharing information regularly, will go a long way in assisting the facility and the public under regular operating circumstances or during an emergency. Currently, 21 licensees of major facilities are required to maintain a public information program.

In these and many other ways, the CNSC contributes to a transparent regulatory environment in Canada and is a world leader in transparency.



NATIONAL NUCLEAR EMERGENCY EXERCISE HELPS ENSURE CANADA IS WELL PREPARED

The events in Fukushima, Japan in 2011 changed the nuclear industry forever. Countries around the world – including Canada – are reassessing their nuclear emergency preparedness and their ability to respond to severe accidents. As part of the process to validate recent improvements and to confirm Canada's ability to respond to a nuclear emergency, Exercise Unified Response took place in May 2014 and was one of the largest nuclear exercises ever held in North America. It was also the first full-scale national nuclear exercise since major revisions were made to the Federal Nuclear Emergency Plan.

Held over three days, Exercise Unified Response involved a simulated severe accident at the Darlington Nuclear

Generating Station. There was broad participation from organizations from all levels of government as well as the operator, non-government and some international partners, such as the IAEA, the U.S. NRC and France's Institut de radioprotection et de sûreté nucléaire.

The exercise was designed to challenge all organizations with a role in responding to a nuclear emergency. It allowed emergency response organizations to test their emergency plans and demonstrate that they can respond effectively to a severe accident, in order to protect the public, infrastructure and the environment.



A ROBUST REGULATORY PROGRAM FOR CYBER SECURITY AT CANADA'S NUCLEAR POWER PLANTS

Over the past few decades, Canadian nuclear power plants (NPPs) have relied increasingly on digital technologies within their control and monitoring systems – making these systems both more efficient and easier to maintain. At the same time, this has introduced the possibility of cyber threats that could have adverse safety or security impacts.

With this understanding, the CNSC sought in 2008 to engage NPP licensees in a comprehensive review of their cyber-security measures for their control and monitoring systems. To identify opportunities for improvement, licensees analyzed existing measures against

current best international practices. They produced updated, even more comprehensive programs, encompassing digital assets and systems for safety, security and emergency preparedness. CNSC staff reviewed these programs and deemed them to meet regulatory expectations.

To further strengthen the CNSC's regulatory framework around cyber security for the nuclear industry, CNSC staff participated extensively in drafting new CSA standard N290.7, *Cyber security for nuclear power plants and small reactor facilities*, which was published in December 2014. This document –



The CNSC sought in 2008 to engage NPP licensees in a comprehensive review of their cyber-security measures for their control and monitoring systems.

which will form the cornerstone of the CNSC's regulation of cyber security in Canada – clearly outlines expectations for protecting systems that are important to safety, security and emergency preparedness, as well as international safeguards against cyber threats at nuclear facilities.

The CNSC has also introduced new cyber-security compliance verification criteria to licence conditions handbooks, and has produced a first-of-its-kind inspection guide for conducting cyber-security inspections. A successful pilot inspection was conducted at an NPP at the beginning of 2015, and further cyber-

security inspections are planned at other Canadian NPPs over the next few years.

Working both nationally with licensees and internationally with its counterparts, the CNSC ensures that Canadian NPPs maintain a strong cyber-security posture. NPP licensees' programs for cyber security are designed, implemented and maintained based upon administrative, operational and technical controls.

These programs are robust to counter the persistent, increasingly sophisticated nature of existing cyber threats that are targeting energy sectors around the world.



MORE CNSC LICENSEES NOW REQUIRE FINANCIAL GUARANTEES

A financial guarantee is a tangible licensee commitment to have sufficient resources to safely terminate licensed activities, in accordance with CNSC regulatory requirements. When licensees terminate their activities, they must properly account for the safe disposal of all licensed material and equipment, and must demonstrate that all locations associated with the licence are free of radioactive contamination. Failure to properly terminate licensed activities can pose a health and safety risk to people and the environment. A financial guarantee does not relieve licensees from complying with regulatory requirements for terminating licensed activities, but ensures there are funds available when licensees are unable to carry out safe termination.

Since the NSCA came into force in 2000, the Commission has required financial guarantees for major nuclear facilities across Canada, including nuclear power plants, uranium mines and mills, research reactors and major waste facilities. In 2011, the Commission published discussion paper DIS-11-01, *Implementation of Financial Guarantees for Licensees*, which stated that – going forward – all other licensees would also have financial instruments acceptable to the Commission. At the August 2014 public Commission meeting, CNSC staff presented a technical briefing on the proposed financial guarantee program, that comprises a new financial instrument for CNSC licences issued for nuclear substances, prescribed equipment and Class II nuclear facilities.

A cobalt storage pool.

The financial guarantee is in the form of an insurance policy whose premiums are shared by all participating licensees and the CNSC is the sole beneficiary.

Potentially affected licensees and other interested persons were given an opportunity to be heard in writing on the proposed licence amendments to implement the new financial guarantee requirement. The financial guarantee is in the form of an insurance policy whose premiums are shared by all participating licensees and the CNSC is the sole beneficiary. The average annual financial contribution from licensees is \$58 per licence (0.44 percent of total calculated liability for safe termination of licensed activities) in order to comply with the new financial guarantee requirements. Licensees can propose an alternative financial instrument, which the CNSC will evaluate. Such a financial instrument is expected to meet the criteria of adequacy and certainty of value, continuity and liquidity, as outlined in section 5.1 of CNSC regulatory guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*.

In January 2015, after an in-writing hearing, a panel of the Commission made a decision that amended licences for nuclear substances, prescribed equipment and Class II nuclear facilities to include



requirements for financial guarantees. This was in accordance with the new financial instrument developed by the CNSC.

Licensed public institutions such as hospitals, universities and government departments do not have to set aside any specific funds or financial instrument, as these public institutions are supported by federal, provincial or municipal governments, which are expected to assume the cost for safe termination of their licensed activities. They only need to acknowledge their financial liability through a signed declaration submitted to the CNSC.



INDEPENDENT ENVIRONMENTAL MONITORING PROGRAM

CNSC inspectors collect water samples from Lake Ontario, next to the Pickering Nuclear Generating Station in Pickering, Ontario.

The CNSC created its Independent Environmental Monitoring Program (IEMP) to add a layer of verification that the public and the environment around licensed nuclear facilities are safe. This program is separate from, but complementary to, the CNSC’s ongoing compliance verification activities, such as reviews of compliance reports and regular inspections. The IEMP is in line with similar programs of other national and international regulatory bodies.

CNSC staff collect samples of air, water, soil, sediment, vegetation such as grass and weeds, and some food, like meat and produce, in publicly accessible locations — for example, parks, residential communities and beaches. The samples are prepared and analyzed at the CNSC’s state-of-the-art laboratory in Ottawa, where they are tested for levels of radiological (nuclear) and

non-radiological (hazardous) substances. Results are published on an interactive, user-friendly dashboard on the CNSC’s website. In 2014, approximately 200 IEMP samples were collected around 12 nuclear facilities.

Since the February 2015 launch, the IEMP dashboard has received very positive feedback from members of the public and licensees. One comment stated: “The CNSC is to be commended for taking a step in the right direction by doing its own sampling and not just relying on the licence holder’s monitoring and proprietary third-party monitoring”.

The IEMP is being implemented for facilities in all segments of the nuclear fuel cycle. For 2015, the CNSC plans to collect IEMP samples at 11 locations, including power plants, a processing facility, a research facility and uranium mines and mills.



SAFE URANIUM MINES AND MILLS

Cameco's McArthur River uranium mine in the Athabasca Basin, Saskatchewan.

A NATURAL RESOURCE

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.

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

SAFETY SUMMED UP

- Personal dose records for operating mines and mills from 2009 to 2014 show that radiation doses to workers were at safe levels and well below regulatory limits.
- In 2014, effluent discharges to the environment from uranium mining were all below regulatory limits.
- The public as well as the locally produced food supply in the Athabasca basin in Saskatchewan continue to be protected.

The CNSC conducts several 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.

MILLENNIUM URANIUM MINE PROJECT

CNSC staff completed a technical review of programs and facility design specifications, interventions received as part of the Participant Funding Program and Cameco's final environmental assessment (EA) report.

In May 2014, at the request of Cameco Corporation, the public hearings regarding the company's Millennium Project were placed on hold. Cameco has committed to work with the CNSC to reschedule these proceedings.

NORTHERN ENVIRONMENTAL ASSESSMENT REGIMES

The CNSC is a regulatory authority for the Nunavut Impact Review Board (NIRB) Part 5 review of the proposed Kiggavik uranium mine and mill development project, as proposed by AREVA Resources Canada Inc. The CNSC is participating as a technical expert in the NIRB review process and has no decision-making authority for the EA review.

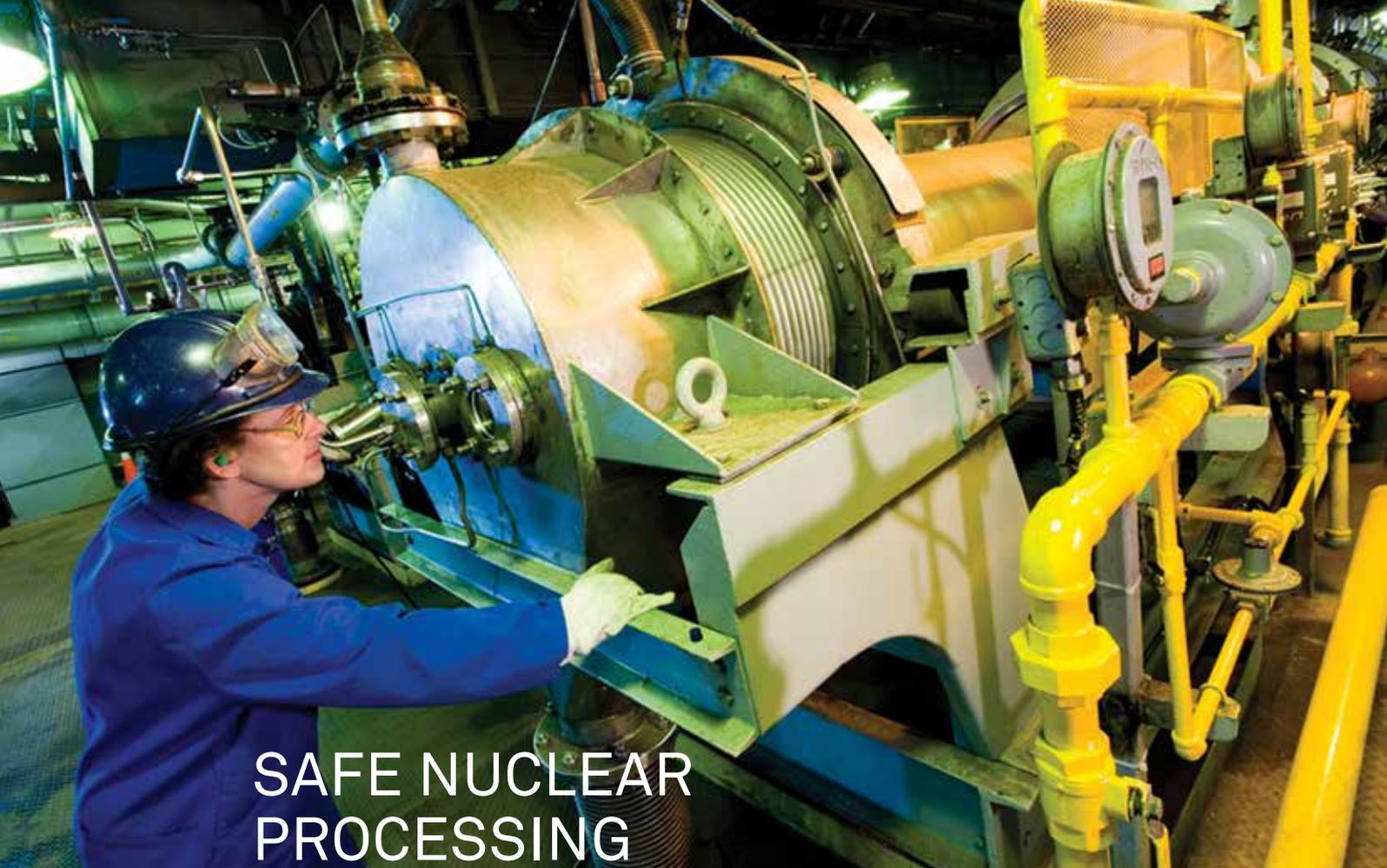
In 2014–15, the CNSC conducted a technical review of AREVA's final environmental impact statement, gave its final written submission to the NIRB, reviewed other interventions and AREVA's responses to those interventions, and developed hearing preparation materials. CNSC staff also participated in the NIRB final hearings that were held in Baker Lake, Nunavut from March 3 to 14, 2015.

In May 2015, the NIRB provided its recommendation to the four responsible federal ministers that the project should not proceed at this time. The decision on the project's future now rests with the Government of Canada.

BUREAU D'AUDIENCES PUBLIQUES SUR L'ENVIRONNEMENT (BAPE)

On March 3, 2014, the Quebec Minister of Sustainable Development, Environment and the Fight Against Climate Change entrusted the Bureau d'audiences publiques sur l'environnement (BAPE) with the mandate to conduct an inquiry and public hearings on the uranium industry in Quebec. The BAPE concluded its mandate with the submission of its report to the Minister on May 20, 2015.

The CNSC actively participated in phases 2 and 3 of the BAPE inquiry, which included participation in 18 hearing days, as well as providing expertise through 6 technical reports, 8 presentations and over 150 written responses to questions from the BAPE panel. All information provided by the CNSC is part of the BAPE documentation registry available on the BAPE website.



SAFE NUCLEAR PROCESSING AND RESEARCH

Worker at Cameco's uranium conversion facility in Port Hope, Ontario.

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 2014–15, there were no events with consequences to public health or the environment.
- Radiation doses to the public and to workers continued to be well below regulatory limits.

The CNSC oversees nuclear processing and research facilities, to protect the surrounding environment as well as people who live and work nearby. 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, to test materials, and to produce radioisotopes for medical procedures.

Table 1: Radiation doses to members of the public, from Canadian nuclear processing and research facilities. All facilities are below 10 percent of the annual dose limit of 1 millisievert (mSv)

Facility	Annual dose limit (%)				
	2010	2011	2012	2013	2014
Chalk River Laboratories (AECL)	3.2	7.4	6.3	6.4	8.1
Cameco Port Hope Conversion Facility	1.9	1.9	2.9	2.1	1.2
Cameco Blind River Refinery	0.6	0.6	1.2	1.2	0.5
Cameco Fuel Manufacturing Inc.	0.8	4.2	3.1	1.3	1.8
GEH-C Toronto	*0.109	*0.062	0.08	0.03	**0.52
GEH-C Peterborough	*<0.001	*<0.001	<0.1	<0.1	<0.1

* Before 2012, GEH-C did not report public dose results. The values reported here are based on CNSC staff calculations of GEH-C emissions with respect to the derived release limits.

**Beginning in 2014, GEH-C Toronto implemented environmental gamma exposure monitoring using licensed dosimeters and began to include this result in the estimated annual public dose.

SHIELD SOURCE INCORPORATED

In March 2014, Shield Source Incorporated of Peterborough, Ontario, was issued a licence to abandon its production facility. CNSC staff verified through inspection and direct measurements that the facility was successfully decontaminated and fit for unconditional release from regulatory control. The facility was returned to its original state for industrial use.

THE TRANSFORMATION OF ATOMIC ENERGY OF CANADA LIMITED

On February 28, 2013, the Minister of Natural Resources announced that Canada would undertake a competitive procurement for a contractor to manage the operations of AECL's nuclear laboratories using a government-owned, contractor-operated model. Similar models are used for managing nuclear operations in other jurisdictions, such as in the United States and the United Kingdom. Going forward, the nuclear laboratories will focus on three key areas: managing 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 Government of Canada is undergoing a procurement process to obtain the services of a contractor to manage Canadian Nuclear Laboratories Limited (CNL). CNL was created in June 2014 as a wholly owned subsidiary of AECL. In October 2014, AECL's licences were transferred from the AECL parent body to CNL. It began operating in fall 2014 and became the employer of the majority of AECL's employees. CNL will perform most of AECL's functions and operations, including managing the operations of AECL's nuclear laboratories, dependent upon attaining the required regulatory approvals. CNL will hold all necessary licences, permits and other regulatory approvals needed to operate AECL's properties and assets.

It is expected that the Government of Canada will procure a contractor to manage all AECL laboratories and sites in late 2015. At that time, CNL ownership will be transferred to the contractor, who will own CNL for the term of the contract and any subsequent extension while providing a new executive team. It is also expected that the contractor will institute changes in CNL to bring about business efficiencies.



SAFE NUCLEAR POWER GENERATION

A CNSC inspector and a worker from NB Power at the Point Lepreau Nuclear Generating Station, New Brunswick.

ENSURING THE 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 conduct inspections, assessments, reviews and evaluations of licensee programs, processes and safety performance.

CONSIDERING THE BRUCE POWER LICENCE RENEWAL APPLICATION

On February 5, 2015, the Commission held Part 1 of a public hearing to consider Bruce Power's application for a five-year renewal of the operating licences for the Bruce A and B Nuclear Generating Stations (NGS), which were due to expire on May 31, 2015, and their consolidation into a single operating licence.

Before this hearing, CNSC staff conducted an extensive review of Bruce Power's two licence renewal applications and supporting information, assessed Bruce Power's past performance against regulatory requirements and prepared Commission member documents (CMDs). Staff also conducted an environmental assessment (EA) under the *Nuclear Safety and Control Act* (NSCA), and prepared an EA information report that was appended to the CMD.

The Bruce Power licence renewal application marks the first proposed migration of referenced CNSC regulatory documents and Canadian Standards Association (CSA) standards to the licence conditions handbook, for licensing purposes. This will simplify and further streamline administration of the power reactor operating licences.

Part 2 of the public hearing was held April 13–16, 2015 in the host community of Kincardine, Ontario. On May 27, 2015, the Commission announced its decision to renew Bruce’s power reactor operating licences as a single licence for both Bruce A and B NGS and valid until May 31, 2020. The Commission also authorized the operation of the Bruce A and B units 1 to 8 up to a maximum of 247,000 equivalent full-power hours (EFPH), up from 210,000 EFPH.

PICKERING NUCLEAR GENERATING STATION

In May 2014, the CNSC held a public hearing to consider the request from Ontario Power Generation (OPG) to remove the hold point associated with a licence condition of the Pickering NGS power reactor operating licence, to allow the reactors to operate beyond 210,000 equivalent full-power hours of pressure tube life. This regulatory hold point had been put in place after OPG announced its intent to cease commercial operations at Pickering by the end of 2020. The hold point required OPG to provide a technical basis to demonstrate that the Pickering NGS will operate safely beyond the pressure tubes’ assumed design life of 210,000 equivalent full-power hours, which unit 6 was expected to reach in June 2014.

The Commission was satisfied that OPG met all necessary pre-requirements and additional requirements associated with the licence condition, as well as its requests for additional information as outlined in the record of proceedings for the Pickering NGS licence renewal. Therefore, the Commission issued a decision allowing OPG to operate the Pickering NGS for up to 247,000 equivalent full-power hours.

REMOVING POINT LEPREAU’S HOLD POINT ASSOCIATED WITH FIRE PREVENTION PROGRAM

The Commission issued a licence renewal decision in 2012 for New Brunswick Power Nuclear’s continued operation of the Point Lepreau NPP. The decision included a licence condition stipulating compliance with CSA N293-07, *Fire protection at CANDU nuclear power plants*, by December 31, 2014. As this requirement has now been met, the Commission removed this hold point, and CNSC staff continue to review its effective implementation through ongoing regulatory oversight.

GENTILLY-2 NUCLEAR GENERATING STATION OVERSIGHT CONTINUES AFTER SHUTDOWN

The Gentilly-2 Nuclear Generating Station, located near Trois-Rivières, Quebec was permanently shut down in December 2012. It was transitioning to safe storage throughout the year and completed the transition on December 2, 2014. In addition, a detailed decommissioning plan is being developed by the licensee for submission and staff review. The CNSC continues to evaluate operations and to verify compliance with regulatory requirements and licence conditions.

JUDICIAL PROCEEDINGS REGARDING THE DARLINGTON NEW NUCLEAR PROJECT AND THE DARLINGTON REFURBISHMENT ENVIRONMENTAL ASSESSMENT

In *Greenpeace Canada v. Canada (Attorney General)*, 2014 FC 463, the Federal Court heard an application from several groups that challenged the adequacy of the federal environmental assessment (EA) for the Darlington New Nuclear Project conducted by

The Pickering Nuclear Generating Station
in Pickering, Ontario.



a joint review panel, as well as the site preparation licence that the JRP, as a panel of the CNSC issued to OPG under the NSCA, following the completion of the EA. The application for the EA challenge was allowed in part. In brief, the failure to comply occurred in three areas: gaps in the bounding scenario; consideration of spent nuclear fuel; and deferral of the analysis of a severe common-cause accident. However, and significantly, the EA report was neither quashed nor set aside in its entirety because the Court found that the EA had been done properly for the most part, except for the three areas mentioned. The Court determined that the report and any consequential issues could be returned to the joint review panel (or a duly constituted panel) for further consideration. OPG, the CNSC and the Attorney General of Canada are appealing the decision and will go before the Federal Court of Appeal in June 2015.

In Greenpeace Canada v. Canada (Attorney General), 2014 FC 1124, the Federal Court dismissed an application for judicial review of the conclusions reached by the CNSC and the Department of Fisheries and Oceans (DFO) on an EA of OPG's plans to refurbish the Darlington nuclear power plant's four reactors. The Court found no reviewable error in the EA and denied the application – upholding the CNSC's and DFO's decision on the EA that OPG's proposal would not likely cause significant adverse environmental effects. The unsuccessful applicants have appealed the decision, and it is anticipated that the Federal Court of Appeal will hear this matter later in 2015.

A CNSC inspector takes background radiation readings inside the Bruce Nuclear Generating Station in Kincardine, Ontario.



INCORPORATING PERIODIC SAFETY REVIEWS

Refurbishments and long-term operation of NPPs are vital to nuclear industry sustainability in many countries, including Canada. According to the International Atomic Energy Agency (IAEA) Power Reactor Information System database, there are 437 reactors operating worldwide. Of these, 327 are older than 25 years, and only 38 new reactors have been put into operation in the last 10 years. Without refurbishments and long-term operation, existing nuclear capacity would fall significantly in the next decade. Internationally, regulatory authorizations of refurbishments and long-term operations are typically based on the outcome of periodic safety reviews (PSRs) conducted by licensees.

A PSR is a comprehensive review of all important aspects of nuclear safety, carried out at regular intervals, typically every 10 years. The objective of a PSR is to ensure a high level of safety throughout the plant's operating life. A PSR considers any issues that might limit the future life of the facility or its

components, and explains how they will be managed. A PSR also has the benefit of identifying and evaluating the safety significance of deviations from applicable modern safety codes and standards and internationally recognized best practices. As a result of the review, the licensee should make all reasonable and practical improvements – including physical modifications to the plant – to enhance the safety of older nuclear power plants to a level approaching that of modern plants, and to allow for long-term operation. Internationally, PSRs are mandatory in many IAEA Member States.

The CNSC developed PSRs in response to the recommendations emanating from the IAEA's Integrated Regulatory Review Service mission (June 2009) and the *CNSC Fukushima Task Force Report* (2011) for it to integrate PSRs into its regulatory framework.

In September 2013, the CNSC initiated a Periodic Application of Integrated Safety Review project to develop its regulatory framework for PSRs, which included a public consultation process ending in

February 2015. In March 2015, the Commission approved the resulting REGDOC-2.3.3, *Periodic Safety Reviews*, for publication. Moving forward, CNSC licensees will be required to conduct PSRs and submit a plan of resulting safety improvements in support of their licence renewal applications.

PSRs do require significant preparation and are typically performed every 10 years. Therefore, CNSC staff are recommending extending the licence renewal time period from the current nominal 5-year period to 10 years so that the PSR can be used in support of licence renewal.

WORKING TOWARD ENHANCED CANDU SAFETY

CNSC staff developed a pragmatic approach to resolving safety issues and developing safety improvement programs using an IAEA technical document, *Generic Safety Issues for Nuclear Power Plants with Pressurized Heavy Water Reactors*, and used feedback from regulatory oversight of currently operating reactors in Canada and worldwide. Collectively, these issues are referred to as the CANDU safety issues.

To date, the industry has achieved significant progress in implementing risk-control measures for CANDU safety issues, further enhancing CANDU reactor safety.

INTRODUCING EMERGENCY-RELATED REGULATORY AMENDMENTS POST-FUKUSHIMA

In April 2011, the CNSC established the CNSC Fukushima Task Force to evaluate the operational, technical, and regulatory implications of the March 11, 2011 nuclear event in Japan in relation to Canadian nuclear power plants. The Task Force recommended amending regulations to be more consistent with international guidance and to

more fully describe requirements for addressing radiological hazards during emergencies.

A discussion paper DIS-13-02 was published in 2013 seeking feedback on a comprehensive suite of proposed amendments to the *Class I Nuclear Facilities Regulations*, the *Class II Nuclear Facilities and Prescribed Equipment Regulations*, the *General Nuclear Safety and Control Regulations*, the *Uranium Mines and Mills Regulations* and the *Nuclear Substances and Radiation Devices Regulations*, as well as the *Canadian Nuclear Safety Commission Rules of Procedure*. The CNSC published a What We Heard Report, summarizing the comments received during consultation.

The CNSC will take this feedback into account when developing the regulatory proposal for pre-publication in the *Canada Gazette*, Part I, before finalizing the proposal for consideration by the CNSC's Commission and the Governor in Council.

MAKING PROGRESS ON THE CNSC INTEGRATED ACTION PLAN TO LEARN FROM THE FUKUSHIMA ACCIDENT

The *CNSC Integrated Action Plan On the Lessons Learned From the Fukushima Daiichi Nuclear Accident* was established in response to the events at Fukushima, and identifies measures to further improve nuclear safety. The plan lists 36 distinct Fukushima action items for NPPs, non-NPPs, and the CNSC. Significant progress has been made to address these action items, with only four remaining and the nuclear industry is on track to complete them by December 2015.

CNSC staff will continue to monitor station-specific action items (21 in total), in a continued effort to verify that licensees are complying with implementation measures. The remaining station-specific action items represent an opportunity for continuous improvement.

DRAFT STUDY ON THE HEALTH AND ENVIRONMENTAL CONSEQUENCES OF HYPOTHETICAL SEVERE ACCIDENT SCENARIOS

CNSC staff responded to the Commission's request from March 2013 for the assessment of the health and environmental consequences of severe accident scenarios to address concerns raised during public hearings on the environmental assessment of the refurbishment and continued operation of the Darlington Nuclear Generating Station, and to update the Commission accordingly. The draft *Study of Consequences of a Hypothetical Severe Nuclear Accident and Effectiveness of Mitigation Measures* was presented to the Commission in June 2014. During the summer of 2014, public consultation was undertaken on the draft document. CNSC staff revised the draft study to reflect the direction from the Commission as well as public comments received and presented the study to the Commission in March 2015.

REGDOC-2.3.2, ACCIDENT MANAGEMENT

CNSC staff incorporated the Fukushima lessons learned as well as stakeholders' input into the revised REGDOC-2.3.2, *Accident Management*. This regulatory document forms the basis for CNSC staff activities to verify compliance with criteria for the implementation of severe accident management at Canadian nuclear power plants.

ASSESSING THE SAFETY PERFORMANCE OF NUCLEAR POWER PLANTS

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

The CNSC has a safety and control area (SCA) framework to evaluate each licensee's safety performance. The framework includes 14 SCAs, which are subdivided into specific areas that define their key components.

Table 2 summarizes the 2014 ratings for Canada's NPPs. This table presents the SCAs for each station, industry averages, and 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). 2014 ratings of particular note:

- A total of 14 FS ratings were obtained – a net increase of three in comparison to 2013.
- All NPPs received a rating of either FS or SA in each SCA.
- Canada's NPPs achieved an average rating of "fully satisfactory" in the following safety and control areas: conventional health and safety, waste management, and security.
- The integrated plant ratings in 2014 were "fully satisfactory" or "satisfactory" for all stations.

COUNTERFEIT, FRAUDULENT AND SUSPECT ITEMS

In 2014, the topic of counterfeit, fraudulent and suspect items (CFSI) gained much attention at the CNSC and with nuclear supply chain professionals at nuclear power plant organizations.

Table 2: Canadian nuclear power plant safety performance ratings for 2014

Safety and control area	Bruce		Darlington	Pickering	Gentilly-2	Point Lepreau	Industry average
	A	B					
Management system	SA	SA	SA	SA	SA	SA	SA
Human performance management	SA	SA	SA	SA	SA	SA	SA
Operating performance	SA	FS	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	SA	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	FS	FS	FS	SA	SA	SA	FS
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	FS	FS	SA	SA	SA	SA

FS – fully satisfactory SA – satisfactory BE – below expectations

Following a significant CFSI event in the Korean nuclear power industry, CNSC staff presented a technical briefing to the Commission on CFSI in 2014. The presentation was posted publicly on the CNSC website.

The CNSC proactively implemented regulatory requirements for CFSI by including a provision for reporting in REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, which was published in May 2014.

The CNSC also completed inspections on supply management at four facilities in 2014. These inspections included criteria for licensee processes to detect and manage CFSI issues.

As a means of increasing knowledge and developing guidance for CFSI, CNSC staff participate on an ongoing basis in various national and international activities related to supply management and CFSI.



SAFE NUCLEAR MEDICINE

Healthcare workers in nuclear medicine in Canada handle radioactive substances safely every day.

DIAGNOSING AND TREATING DISEASES

The Canadian Nuclear Safety Commission (CNSC) regulates medical uses of nuclear substances and radiation devices, ensuring that equipment and procedures are safe for Canadians. In diagnostic nuclear medicine, radiopharmaceuticals are given to patients by injection or as a pill. The radiation emitted by the radiopharmaceutical is detected by equipment such as gamma cameras or PET scanners and images are reconstructed by computers. This allows doctors to see organs, tissues and other internal structures

and diagnose diseases non-invasively. In therapeutic nuclear medicine, radioactive isotopes are administered to patients to treat illnesses such as thyroid cancer.

In radiation therapy, diseases are treated by delivering a large, targeted dose of radiation to a tumour. The radiation can be delivered externally, with the source outside the patient's body (external beam radiation therapy) or internally (brachytherapy). In external beam radiotherapy, many new types of equipment came into popular use in Canada in 2014–15. Operating at much higher dose rates, this new generation of medical accelerator allows a doctor to deliver a higher dose of radiation to the tumour while sparing the healthy organs, resulting in better outcomes with fewer side effects.

Historically, the Canadian medical sector represents around 20 percent of all CNSC licences.

SAFETY SUMMED UP

- The CNSC performed 306 inspections in the medical sector during 2014-15
- In 2014–15, all medical-sector nuclear energy workers (NEWs) received radiation doses below the annual limit of 50 millisievert (mSv)/yr that applies to NEWs.
- 81.7 percent of medical sector NEWs received less than the annual radiation dose limit for members of the public of 1 mSv/yr.
- 99.9 percent of other workers received less than the annual radiation dose limit for members of the public of 1 mSv/yr. Only one non-NEW received a dose above their applicable regulatory limit of 1 mSv/yr.

NUCLEAR SUBSTANCES USED IN MEDICAL APPLICATIONS

Exploration of alternative technologies for producing technetium-99m (Tc-99m) picked up speed with Canadian cyclotron consortiums demonstrating that they can produce this isotope on a large scale. Some of the projects are in the process of obtaining Health Canada approval for the use of cyclotron-produced Tc-99m in humans.

PUBLICATION OF SECURITY OF NUCLEAR SUBSTANCES: SEALED SOURCES

The regulatory document REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* was published in 2013. It sets out the minimum security measures that licensees must implement to prevent the loss, sabotage, illegal use, illegal possession, or illegal removal of sealed sources during their entire lifecycle (including while the sources are in storage, transported or being stored during transportation). The first phase of implementation was completed in 2014–15, when all licences for sealed nuclear substances were amended to include a licence condition for mandatory compliance with REGDOC-2.12.3.

FINANCIAL GUARANTEES

Since the *Nuclear Safety and Control Act* came into force in 2000, the Commission has required financial guarantees for all major nuclear facilities across Canada, including nuclear power plants, uranium mines and mills, research reactors and major waste facilities. In January 2015, the Commission amended all licences for nuclear substances, prescribed equipment and Class II nuclear facilities to include requirements for financial guarantees through an insurance program. This program reduces the financial burden on small operators, ensures regulatory control over sources and eliminates factors that cause orphan sources.



SAFE NUCLEAR SUBSTANCES AND TRANSPORTATION

Cask to transport irradiated nuclear fuel at Chalk River Laboratories, Ontario.

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 commercial sectors.

SAFETY SUMMED UP

- In 2014–15, the CNSC performed 1,453 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. Average compliance levels continue to trend towards higher satisfactory ratings.
- The CNSC issued 12 orders to licensees across the industrial and academic sectors during the reporting. This amount represents a reduction from 18 orders issued in the previous year. Additionally, 12 administrative monetary penalties were issued in 2014–15.

CERTIFIED EXPOSURE DEVICE OPERATORS AND THE NEW CSA PCP-09 STANDARD

In August 2014, CNSC staff presented the new Canadian Standards Association standard PCP-09 (CSA PCP-09) to the Commission. The CNSC will use this standard as part of the process to certify exposure device operators (EDOs). The new PCP-09 will replace the current CNSC document G-229 as the basis for CNSC certification of EDOs. CNSC staff ensure that licensees and certified EDOs follow CSA PCP-09 guidance, to be certain that EDOs meet CNSC requirements, that they comply with regulatory provisions relevant to radiography operations, and that they maintain their knowledge and qualifications. This includes CNSC inspections to verify that certified EDOs have new CNSC certificates, which now show an expiry date.

The CNSC is implementing its new process for certifying EDOs using CSA PCP-09 in a gradual fashion and will complete the implementation by September 1, 2016.

SUPPORTING THE PROJECT TO REPATRIATE HIGHLY ENRICHED URANIUM TO THE UNITED STATES

In December 2014, CNSC staff completed their review of AC International's application to certify a transport package designed for the planned shipment of highly enriched uranyl nitrate liquid, and their technical assessment report was posted on the CNSC website for public comments. Disposition of the comments has been completed, and the CNSC is waiting for the United States to issue its revised certificate for the package before finalizing its recommendation for a certification decision.

CONTINUING A COMPREHENSIVE OUTREACH PROGRAM FOR ALL NUCLEAR SUBSTANCE LICENSEES

The CNSC held outreach activities across Canada, in a continued effort to create more opportunities for licensees to interact with the regulator outside the scope of inspection and licensing. CNSC staff believe that increased awareness and better understanding of regulatory requirements will contribute to enhanced workplace safety – translating to improved compliance.

The 2014 CNSC outreach program for licensees using nuclear substances involved CNSC staff visiting 23 cities across Canada. Topics included:

- existing regulatory requirements, such as those for reporting and transport of radioactive materials
- new regulatory requirements, such as REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*, and financial guarantees
- update on changes to the compliance program and inspection results from the previous year
- information on the forthcoming amendments to the *Radiation Protection Regulations*

All packaging types used to transport radioactive substances are certified by the CNSC.



CONSOLIDATING LICENCES TO REDUCE ADMINISTRATIVE BURDEN

Over the past several years CNSC licences have been consolidated upon licensee request, where feasible. Throughout 2014, the CNSC continued to consolidate licences for activities conducted under the umbrella of the same radiation safety program, reducing paperwork and administration for both licensees and the CNSC.

For example, a single consolidated licence for a radiotherapy facility replaced five separate licences.

STRENGTHENING RESPONSE TO REPORTABLE EVENTS

In 2014, the CNSC undertook a review and analysis of its program for events that licensees must report to the organization. This program includes the event-reporting process and procedure, the event database and event notification. Many improvements to the existing program are currently under way, and it is expected that the revised program will be

implemented in summer 2015. A key element of the revised program will be the use of the International Nuclear and Radiological Event Scale (INES), developed by the International Atomic Energy Agency to report on the risk significance of events.

IMPLEMENTING A PORTABLE GAUGE STRATEGY

Since 2010, the CNSC has noted that licensee compliance in the portable gauge industry has been declining, and has issued most of its enforcement actions to licensees in this sector. In response, it developed a strategy to promote compliance and safety culture by improving communication between CNSC staff and portable gauge licensees.

In June 2014, the CNSC held a pilot workshop consisting of presentations delivered by CNSC staff, followed by a question-and-answer session and general discussion. In light of positive feedback on this session, a similar workshop was held in Calgary in February 2015. Additional workshops will be held across Canada in 2015.

Table 3: Reported events for lost or stolen sealed sources or radiation devices

	2011–12	2012–13	2013–14	2014–15
Number of reported events for lost or stolen sealed sources or radiation devices	8	16	14	14
Number of events where lost or stolen sealed sources were recovered	1	5	7	6
Number of events where lost or stolen sealed sources have not yet been recovered	7	11	7	8
Number of events where sealed sources or radiation devices lost or stolen from previous years were found	7	2	3	3

Positive results have already been observed: The CNSC has noted marked improvement in compliance rates for these licensees, and has had to take fewer measures to enforce regulatory requirements.

The CNSC will continue its risk-informed inspections of licensees with average- and above-average-size inventories of sealed sources. In the near future, all routine inspections will include a complete physical inventory verification.

ENHANCING CONTROL OF INVENTORIES OF DISUSED AND HISTORICAL SOURCES

Throughout 2014, the CNSC took steps to enhance its regulatory control over inventories of disused and historical sources. Accomplishments included:

- developing and publishing products to promote compliance, such as special edition of a newsletter outlining best practices for licensee inventory control
- performing enhanced inspections, including physical verification of sealed-source inventories, to verify compliance at institutions (e.g., universities and hospitals) with significant numbers of sources
- creating and conducting a licensee survey to further evaluate licensees' safety programs and measures for managing the disposal of unused and disused sources

LOST OR STOLEN NUCLEAR SUBSTANCES AND RADIATION DEVICES

The CNSC has the Sealed Source Tracking Program to ensure that lost or stolen nuclear substances and radiation devices are tracked and recovered as soon as possible. Table 3 shows the number of events for lost or stolen sources and devices that were reported annually from 2011–2012 to 2014–15.



SAFE WASTE MANAGEMENT

Dry storage containers for used nuclear fuel are managed at each of Canada's nuclear power generating sites.

SECURE STORAGE FOR FUTURE GENERATIONS

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

SAFETY SUMMED UP

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

TWO GEOLOGICAL REPOSITORY PROJECTS

A geological repository is constructed underground, usually at a depth of several hundred metres or more below the surface, in a stable rock formation. Two long-term radioactive waste management initiatives, which may result in geological repositories, are under way in Canada: the Deep Geologic Repository (DGR), proposed by Ontario Power Generation (OPG), to house low- and intermediate-level radioactive waste, and the initiative for a DGR for Canada's used nuclear fuel, led by the Nuclear Waste Management Organization (NWMO).

ONTARIO POWER GENERATION'S PROPOSED DEEP GEOLOGIC REPOSITORY FOR LOW- AND INTERMEDIATE-LEVEL WASTE

OPG is proposing to construct a deep rock vault in clay-rich limestone, more than 600 metres underground, which is designed to be a long-term management facility for its low- and intermediate-level radioactive waste.

Since December 2011, 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) to form an independent joint review panel (JRP) – examined the proponent’s environmental impact statement and licence application for the first phase and the environmental assessment (EA) information for all phases of the project.

This three-member JRP held public hearings in September and October 2013, in the towns of Kincardine and Port Elgin, near the Bruce nuclear site where the DGR would be located. In September 2014, the panel reconvened for additional hearing days in Kincardine.

During the hearings, the panel heard over 200 presentations and interventions from the CNSC, OPG, federal and provincial departments and ministries, local municipalities, and First Nations and Métis groups, as well as members of the public and other organizations and bodies. There were also many questions from the panel and those in attendance. The panel issued 509 requests for additional information from OPG. The JRP must be satisfied that the proposed project has met stringent requirements under the *Canadian Environmental Assessment Act, 2012*, as well as the NSCA, before OPG can be issued a licence to prepare a site and to construct the DGR. The CNSC has been providing technical and research assistance as the JRP conducts its complex work.

On May 6, 2015, the panel submitted an EA report to the federal Minister of the Environment for a decision on its recommendations. The panel concluded “that the project is not likely to cause

significant adverse environmental effects, taking into account the implementation of the mitigation measures committed to by OPG together with the mitigation measures recommended by the panel”. 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 for and construct the DGR.

THE NUCLEAR WASTE MANAGEMENT ORGANIZATION’S INITIATIVE FOR A DEEP GEOLOGICAL REPOSITORY FOR CANADA’S USED NUCLEAR FUEL

The NWMO was created under the *Nuclear Fuel Waste Act* with the objective to propose approaches to the Government of Canada for the management of nuclear fuel waste. Since 2010, the NWMO has been leading a site-selection process to identify an informed and willing community to host a DGR for Canada’s used nuclear fuel. The DGR would be housed in a suitable rock formation to contain and isolate the radioactive waste over long periods of time. As of May 1, 2015, 9 communities were still part of the NWMO’s “learn more” process.

At this early stage, the CNSC has been meeting with the involved communities to help them better understand the safety and regulatory matters that would be examined for this repository, including information on the transport of used fuel as part of the overall project.

In 2014–15, at the request of community representatives, the CNSC met with the community of Creighton, Saskatchewan, and the Ontario communities of Elliot Lake, Spanish, Blind River and the Township of the North Shore.

The CNSC also held five open houses in Hornepayne, the Township of Huron-Kinloss, Elliot Lake and Spanish. In addition to meeting with communities, CNSC staff also held discussions with two Aboriginal groups, who had requested to learn more about the CNSC's regulatory role.

NUCLEAR LEGACY SITES

Legacy sites consist of outdated, unused research facilities and buildings, a wide variety of buried and stored radioactive waste, and affected lands. These sites 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 Atomic Energy of Canada Limited.

The CNSC performs 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.

SASKATCHEWAN RESEARCH COUNCIL – ENVIRONMENTAL ASSESSMENT AND APPLICATION FOR A WASTE NUCLEAR SUBSTANCE LICENCE FOR THE FORMER GUNNAR URANIUM MINE AND MILL SITE

The Commission held a public hearing in November 2014 to consider the conclusions of the environmental assessment report, and the application from the Saskatchewan Research Council (SRC) for a 10-year waste nuclear substance licence for the Gunnar Remediation Project, located in northern Saskatchewan.

The Gunnar legacy mine site was being managed by SRC – an agent of the Saskatchewan government. The requested licence was intended to allow SRC to continue its activities related to the Gunnar Remediation Project under the CNSC's regulatory oversight. The Commission accepted the environmental assessment report and issued a licence valid from January 14, 2015 to November 30, 2024. The Commission imposed hold points on the 10-year licence. The Commission decided it would hold proceedings to approve the release of the hold points which would allow the licensee to proceed to Phases 2 and 3 of the remediation project.

SRC will remediate various site components of the 70-hectare former uranium mine and mill, including the covering of tailings areas, waste rock management, and management of demolition debris.



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

The CNSC has a robust regulatory framework and mandate for the protection of the environment and people's health and safety.

ENVIRONMENTAL ASSESSMENTS UNDER THE NUCLEAR SAFETY AND CONTROL ACT

The environmental assessment (EA) under the *Nuclear Safety and Control Act* (NSCA) is a component of the CNSC licensing process and carried out as part of the CNSC's review of all licence applications. No decision is rendered on the EA itself, as the information is intended to support the regulatory decision being sought under the NSCA. In the last fiscal year, reports on EAs under the NSCA were completed for the following licence applications:

- *Environmental Assessment Information Report: Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL)* (December 2014), for NAC International Inc.'s application for the certification of a package to transport HEUNL
- *Report on the Clean-up and Abandonment of Shield Source Inc.* (March 2015)
- *Environmental Assessment Information Report: Bruce Power Inc. – Bruce A and B Nuclear Generating Stations Licence Renewal* (February 2015).

Two EAs that began under previous legislation – the *Canadian Environmental Assessment Act* (CEAA 1992) – were completed as per subsection 124(2) of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012).

- In January 2015, the Commission determined that the Saskatchewan Research Council's proposal for the Gunnar Remediation Project in Saskatchewan, taking into account mitigation measures, is not likely to cause significant adverse environmental effects
- In July 2014, the Commission determined that Cameco Corporation's proposed Key Lake Extension Project in Saskatchewan, taking into account mitigation measures, is not likely to cause significant adverse environmental effects

Two EAs that began under the CEAA 1992 and transitioned to the CEAA 2012 are ongoing.

- Ontario Power Generation's proposal to construct and operate a deep geological repository for disposal of low and intermediate-level radioactive wastes, which is awaiting the federal Minister of the Environment's decision.
- Cameco Corporation's proposed mining of the Millennium uranium deposit in Saskatchewan, which has been put on hold by Cameco Corporation, because of current economic conditions.

MEASUREMENTS AND DOSE CONSEQUENCES OF TRITIUM IN MUNICIPAL SEWAGE SLUDGE

The CNSC regulates and monitors environmental releases of tritium from human activities, in order to protect the health and safety of the public and the environment. Tritium is a radioactive isotope of hydrogen and emits low-energy beta radiation that can be absorbed by paper, plastic, glass or metal. Tritium can pose a health risk if a person ingests it by drinking water or by consuming food, or if it is inhaled or absorbed through the skin in large quantities.

Tritium is formed naturally in the upper atmosphere from the interaction of gases and cosmic radiation. It is also by-product of the operation of CANDU nuclear reactors and some research reactors. Some of the tritium produced by nuclear and research reactors is recovered and used by processing facilities to manufacture non-electrical self-luminescent lights and paints (e.g., those used in exit signs, airport runway lights, watch dials and gunsights).

In 2013, as requested by the Commission, CNSC staff measured the concentrations of tritium in sewage sludge in 11 various municipalities in Ontario. This request was in response to concerns raised in 2011 by members of the public during the Commission meeting for SRB Technologies (Canada) Incorporated's (SRB) *Annual Status Report on the Safety Performance of the Facility*.

In March 2015, the CNSC released the findings of the study, in the report *Measurements and Dose Consequences of Tritium in Municipal Sewage Sludge*. The report revealed that tritium concentrations in sewage sludge and liquid effluent were below the analytical detection limit (i.e., the



minimum concentration that can be detected by instrumentation) for all the wastewater treatment plants (WWTPs) sampled, except those in Peterborough and Pembroke. In 2013, both Shield Source Incorporated, located in Peterborough, and SRB, located in Pembroke, were in operation, manufacturing self-luminous safety signs using tritium.

Using the finding from the Pembroke WWTP, the radiation doses from the measured concentration of tritium in sewage sludge were calculated for two representative persons – a worker at a WWTP involved in sewage sludge loading, and a worker at a municipal landfill involved in applying landfill cover to waste. The estimated annual effective doses were well below both the annual public dose limit of 1 millisievert and the doses known to cause health effects. The dose from tritium in sewage sludge also represents a small fraction of the natural background radiation. As a result, the report concluded that there is no impact on public health.

To obtain a copy of the full technical study, please contact info@cnsccsn.gc.ca or call 613-995-5894 or 1-800-668-5284 (in Canada).

INDEPENDENT ENVIRONMENTAL MONITORING PROGRAM

The CNSC has implemented its Independent Environmental Monitoring Program to verify that the public and the environment around licensed nuclear facilities are safe.

LABORATORY MAKING PROGRESS TOWARDS ISO ACCREDITATION

The CNSC has a state-of-the-art laboratory that supports its regulatory mandate. The laboratory continues to make progress towards ISO-17025 accreditation for its calibration services, with completion expected for the end of 2015. During 2014–15, the application and associated documents were pre-reviewed by the accreditation body (NRC CLAS). As per the review process, lab staff developed a response action plan and implementation is ongoing. The CNSC anticipates being able to submit the revised application and associated documents for a final evaluation in fall 2015.



NATIONAL SECURITY AND INTERNATIONAL COMMITMENTS

CNSC staff participating in Exercise Unified Response – a national full-scale emergency exercise.

THE CNSC LEADS 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 the country's international agreements in the area of nuclear safety, non-proliferation and security.

THE CONVENTION ON NUCLEAR SAFETY

At the 6th Review Meeting of the Contracting Parties to the *Convention on Nuclear Safety* (CNS) in Vienna in April 2015, the CNSC called for greater transparency in nuclear safety at the international level. It shared Canada's national report, as well as the questions and answers arising from the peer-review process. Canada was the only country to do so and invited other countries to share similar information.

The CNSC recommended that Contracting Parties to the CNS that do not comply with their obligations should be named. It also called for the World Association of Nuclear Operators to report non-responsive operators to their national regulators.

In addition, the CNSC urged contracting parties to make public reports of the peer-review missions of the International Atomic Energy Agency (IAEA), as well as the actions taken to respond to recommendations and suggestions. It gave the example of Canada's comprehensive action plan in response to the Fukushima accident, which was subject early on to international scrutiny through a formal peer review conducted by the IAEA at the CNSC's request. The lessons learned, which are reflected in the action plan, are being applied in Canada to enhance the safety of nuclear facilities.

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.

During 2014–15, the CNSC conducted licensing assessments and reviewed decisions on applications for 535 export licences (492 in 2013–14). As well, 167 import licences were issued for nuclear substances (157 in 2013–14), prescribed equipment and prescribed information. An additional 254 export licences were issued for risk-significant radioactive sources (212 in 2013–14), in accordance with the *Nuclear Non-proliferation Import and Export Control Regulations* and the *General Nuclear Safety and Control Regulations*.

CANADA–INDIA NUCLEAR COOPERATION AGREEMENT

The Canada–India Nuclear Cooperation Agreement (NCA) – together with the administrative arrangement through which it will be implemented – allows Canadian firms to export and import controlled nuclear materials, equipment and technology to and from India to facilities subject to safeguards applied by the IAEA.

In 2014–15, the CNSC did not export or import nuclear substances, prescribed nuclear equipment or prescribed nuclear information subject to the provisions of the Canada–India NCA.

SAFEGUARDS

The CNSC is Canada's designated safeguards authority, responsible for managing Canada's safeguards agreements with the IAEA. As Canada's safeguards authority, the CNSC also actively supports the IAEA in its ongoing efforts to evolve the safeguards system toward greater effectiveness and efficiency, for benefit both within Canada and abroad.

CANADIAN SAFEGUARDS SUPPORT PROGRAM

The CNSC initiated funding in 2014–15, under the Canadian Safeguards Support Program (CSSP) for two Canadian experts to work at the IAEA, within the fields of information technology business process analysis and synthetic aperture radar imagery analysis.

The business process analysis expert is to work on a secure electronic communication channel that will upload official State reports and other secure communications to the IAEA, which are key elements of the CNSC's compliance with the Canada/IAEA international safeguards agreement and other Member State obligations.

Cameco's uranium conversion facility in Port Hope, Ontario.



A cost-free expert in satellite imagery will also be provided to the IAEA, with the primary goal of assisting with integrating synthetic aperture radar into existing satellite imagery methodology for safeguards. This will benefit Canada through the improved use of satellite imagery for the purpose of safeguards verification, which can contribute to lower IAEA in-field effort. One specific opportunity for such an application would be the ongoing monitoring of the non-diversion of depleted uranium scrap from the proposed Port Hope long-term waste management facility.

The CNSC also carried out several other projects in 2014–15 under the CSSP. These included supporting the successful delivery of three IAEA training courses focused on the in-field use of Canadian-developed safeguards equipment, enabling Canada's contribution to the development of four IAEA guides on safeguards implementation practices, and furthering the CNSC's work in the area of material balance evaluation at uranium processing facilities.

PROJECT TO TRANSFER WASTE TO LONG-TERM WASTE MANAGEMENT FACILITY

As the Canadian nuclear industry goes through changes, such as when facilities are refurbished or decommissioned, or when new facilities have to be built, fresh safeguards challenges arise. The CNSC's current challenges include finding an appropriate solution for a safeguards approach for transferring legacy depleted uranium scrap from Cameco's Port Hope Conversion Facility to the planned long-term waste management facility.

In fall 2014, significant progress was achieved when the CNSC President and the IAEA Deputy Director General (Safeguards) agreed on a path forward, seeking to satisfy Canada's international safeguards obligations without unduly interfering in this important and sensitive project. The CNSC will work closely with the IAEA and Cameco in the coming months to design and implement sampling measures based on these agreed principles.

NATIONAL NUCLEAR FORENSICS PROJECT

The CNSC continued to support Canada's commitment to establishing a national nuclear forensics capability. The CNSC laboratory is undergoing a transition to an operational role within the national nuclear forensics laboratory network.

The CNSC sample analysis is continuing on schedule, and the CNSC laboratory characterized approximately 100 samples in 2014–15. The development of data analytics algorithms has shown promising results to date, for both chemometric and machine learning approaches. The next step is to consolidate the findings of the algorithm development as a composite (unified) implementation of both approaches.

Trilateral work has been launched with the United Kingdom and United States to develop a synthetic uranium ore concentrate data set for cross-validation and benchmarking purposes.

Tables 4 and 5 present data on safeguards activities and material accounting in Canada for 2014–15.

Table 4: Onsite safeguards activities in Canada

Activity type	Number of inspections	
	2014–15	2013–14
CNSC inspections	12	18
IAEA inspections	55	56
Design information verifications	30	23
Equipment installation and maintenance	52	50
Other	9	19

Table 5: State accounting reports submitted by the CNSC to the IAEA

Type of report	Number of reports submitted	
	2014–15	2013–14
Inventory change report	350	334
Physical inventory listing	49	51
Material balance report	50	51

Notes:

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



STAKEHOLDER RELATIONS

CNSC staff travel across Canada informing Canadians and answering their questions on the nuclear sector.

REACHING OUT TO CANADIANS

Canadian Nuclear Safety Commission (CNSC) staff travel from coast to coast to coast, visiting Canadians in their communities and answering their questions on regulating the nuclear sector. This ongoing dialogue is important for increasing public understanding of the CNSC's role of protecting Canadians, their health and the environment.

outreach and engagement targeted at the general public, communities that host nuclear facilities, and youth; enhancing and expanding upon the CNSC's digital presence; for example, through social media, providing regulatory oversight of licensee public information and disclosure programs, consulting with Aboriginal communities and providing guidance on how to engage with them; and providing funding for public participation.

IMPLEMENTING EFFECTIVE APPROACHES TO ENGAGEMENT AND COMMUNICATIONS

Engaging stakeholders in two-way dialogue and disseminating objective information is a big part of the CNSC's mandate. In 2014–15, the CNSC continued to make engagement and communications activities a priority: conducting

DEMONSTRATING A COMMITMENT TO OUTREACH AND ENGAGEMENT

In 2014–15, CNSC staff, such as experts in nuclear science and safety, participated in more than 160 events to continue to deliver on the organization's commitment to public outreach and engagement. These efforts help the CNSC fulfill its mandate of disseminating scientific, technical and regulatory information concerning its activities.

The CNSC makes it a priority to maintain open lines of communication with nuclear host communities. During the past year, CNSC experts took part in 34 events, including open houses, CNSC 101 information sessions and community meetings. These unique opportunities to meet community residents enabled staff to explain the CNSC's role as a nuclear regulator, discuss the safety performance of the neighborhood nuclear facility, demystify nuclear science, and answer questions.

As part of the Nuclear Waste Management Organization's process to identify an informed and willing community to host a deep geological repository for Canada's used nuclear fuel, the CNSC travelled throughout Ontario during the year. Open houses were held in Hornepayne, Blind River, Elliot Lake, Spanish and the Township of Huron-Kinloss.

Youth was another target audience this year, and the CNSC held 13 events aimed at engaging young people. CNSC staff participated in teacher conferences, science fairs, and a summer camp. They also visited classrooms to help students and educators connect the dots between enjoying science and pursuing a career in science.

ENHANCING THE CNSC'S ONLINE PRESENCE

For the CNSC, reaching out to Canadians also means maintaining an ongoing digital presence through its website, the Government of Canada's website and social media, including Facebook and YouTube. During 2014–15, the CNSC website received over 478,000 visits and its following on Facebook and YouTube more than doubled, reaching a total of 3,000 subscribers.

This year, the CNSC also examined using Twitter as another way to communicate with the public and fulfill its communications objectives. As a result of this initial groundwork, the CNSC launched Twitter in spring 2015.

The CNSC produces plain-language material geared toward the public, in a variety of formats. In 2014–15, this material included 12 original videos, more than 50 presentations added to YouTube (garnering about 218,000 views), and website additions of 5 interactive modules, 7 infographics, and 21 articles highlighting CNSC activities over the past year.

The CNSC encourages its experts to share their knowledge by preparing technical papers, presentations and journal articles. The latter are peer-reviewed before they are published in scientific journals. In 2014–15, 19 abstracts were published on the CNSC website.

ANSWERING QUESTIONS

In its ongoing commitment to transparency and openness, the CNSC has communications staff who field and answer questions from the public and the media. In 2014–15, they responded to 1,170 requests from the public and 60 media inquiries. People can contact the CNSC at any time at info@cnscccsn.gc.ca or by calling 613-995-5894 or 1-800-668-5284 (in Canada).

CLARIFYING LICENSEES' ROLE IN INFORMATION DISSEMINATION

While the CNSC continually strives to be a leader in public communication on nuclear safety, industry also has a role in building public understanding. Licensees are required to provide stakeholders with information on their safety records and nuclear activities.

This industry responsibility was formalized in 2013, when the CNSC implemented new regulatory requirements outlined in RD/GD-99.3, *Public Information and Disclosure*. These requirements put the onus on licensees to define their communication strategies and to proactively inform target audiences of regular facility activities as well as any unplanned events.

The CNSC believes that licensees need to communicate openly and effectively to build trust and public awareness within their communities – which is especially important in the unlikely event of an emergency. The CNSC's regulatory document RD/GD-99.3 states criteria for timely, transparent licensee communication implemented via public information and disclosure programs at all major nuclear facilities, and aims to promote the development and maintenance of open communication channels.

Smaller facilities, operating research reactors and accelerators, also began submitting information on their public information and disclosure programs to the CNSC in 2014–15. These programs are supported by disclosure protocols, which describe the type of information or reports to be made public, as well as the criteria for determining when and where such information and reports are to be published. To help keep the public informed, 35 event reports from major nuclear facilities were posted on the CNSC website.

In its oversight role, the CNSC verifies that public information and disclosure programs meet requirements. In 2014–15, the CNSC contacted over 30 licensees about program issues.

RD/GD-99.3 aims to ensure the development and maintenance of open communication channels. The CNSC recognizes open and transparent communications go a long way ensuring licensees build trust and public awareness within communities, which is especially important in the unlikely event of an emergency.

CONSULTING WITH ABORIGINAL GROUPS

The CNSC is committed to upholding the honour of the Crown through building relationships, sharing information, and meeting the CNSC's obligations under section 35 of the *Constitution Act, 1982*. In 2014–15, the CNSC participated in 14 outreach and engagement meetings with Aboriginal groups, including meetings for the renewal of the Bruce operating licences, the renewal of the Darlington operating licence, the Nuclear Waste Management Organization's plan for a deep geological repository for used nuclear fuel, Ontario Power Generation's plan for the Deep Geologic Repository (DGR) Project for low- and intermediate-level radioactive waste and the Gunnar remediation project.



The CNSC also provided support regarding Aboriginal consultation for all public Commission hearings including the DGR joint review panel, the Bruce Power operating licence renewal (Part 1), and the Gunnar remediation project.

PROVIDING GUIDANCE ON ABORIGINAL ENGAGEMENT AND CONSULTATION

In 2014, the CNSC requested public input on draft REGDOC-3.2.2, *Aboriginal Engagement*. This regulatory document identifies CNSC licensee requirements for Aboriginal engagement, and provides guidance and information on conducting Aboriginal engagement activities. In February 2015, a 120-day public consultation period for the regulatory document was completed. A revised version will be submitted to the Commission for approval in 2015–16.

OFFERING FUNDING TO ENCOURAGE PUBLIC AND ABORIGINAL PARTICIPATION

The CNSC continued to administer its Participant Funding Program (PFP), 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 past year, the PFP awarded over \$246,000 to 41 recipients for 8 different projects. Of those 41 recipients, 21 were Aboriginal groups or organizations and they were awarded over \$129,000 for their participation in the CNSC regulatory process.

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
(term has expired but
authorized to complete
two files seized of prior
to term expiry)



Mr. André Harvey
Québec City, Quebec

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 (term has
expired but authorized to
complete two files seized
of prior to term expiry)



Mr. Dan D. Tolgyesi
Québec City, Quebec

Named as a
permanent member on
May 30, 2008



Ms. Rumina Velshi
Toronto, Ontario

Named as a
permanent member on
December 15, 2011



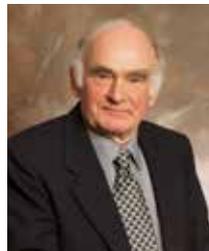
Dr. Alexander McEwan
Professor and Chair,
University of Alberta
Cross Cancer Institute
Edmonton, Alberta

Named as a permanent
member on March 7, 2013



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

Named as a
temporary member on
December 1, 2011 to
the joint review panel
for the Deep Geologic
Repository for low- and
intermediate-level
radioactive waste



Dr. Gunter Muecke
Professional Geologist

Named as a
temporary member on
December 1, 2011 to
the joint review panel
for the Deep Geologic
Repository for low- and
intermediate-level
radioactive waste



Dr. Stella Swanson
Environmental
consultant

Named as a
temporary member
on December 1, 2011,
and currently Chair of
the joint review panel
for the Deep Geologic
Repository for low- and
intermediate-level
radioactive waste

COMMISSION OPERATIONS

INDEPENDENT AND TRANSPARENT DECISION MAKING

The Commission makes independent, fair and transparent decisions on the licensing of major nuclear-related activities or facilities, and is central to the functioning of the Canadian Nuclear Safety Commission (CNSC). 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 decides whether to license nuclear-related activities, it considers applicants' proposals, recommendations from CNSC staff, and stakeholder views. Each licensing decision 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 take place. 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, and transcripts of public hearings and meetings are also available. Webcasts and transcripts are archived on the CNSC website for at least three months after the session.

COMMISSION MEMBERSHIP

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 by the Governor in Council whenever necessary. The CNSC president is the only full-time Commission member.

Under amendments to the *Nuclear Safety and Control Act* that were 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

FINANCIAL STATEMENTS FOR THE YEAR ENDING MARCH 31, 2015

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

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 \$153.9 million in 2014–15, up from \$149.1 million a year earlier, for a total increase of \$4.8 million (3.2%). A total of \$104.8 million of expenses were paid for by earned revenues, while the CNSC's net cost of operations of \$49.1 million was funded through government funding, including voted appropriations (vote 1 – Program expenditures).

REVENUES

In Budget 2013, the CNSC received statutory authority – pursuant to subsection 21(3) of the *Nuclear Safety and Control Act* – to spend during a fiscal year any revenues that it receives in the current or previous fiscal year through the conduct of its operations. The CNSC collects regulatory fees in accordance with the *CNSC Cost Recovery Fees Regulations*. In 2014–15, the CNSC funded approximately 68% of its total cost of operations from fees collected from licensees.

Revenues totalled \$104.8 million in 2014–15, an increase of \$1.3 million (1.3%) from \$103.5 million in 2013–14. While revenues have remained relatively stable from 2013–14 to 2014–15, revenues collected through RAP licences and formula fees have increased, while revenues earned through special projects have decreased. The increase in revenues earned through RAP licences (\$1.5 million increase) is consistent with the increase in overall expenses observed from 2013–14 to 2014–15. As for formula fees (\$0.5 million increase), an increase was expected in 2014–15 following changes to the formula implemented in 2013–14. Since the modifications implemented in 2013–14 were applied to renewals throughout the year, 2014–15 represented the first year where the new formula was fully implemented. Those increases were partially offset by decreases in revenue from special projects (\$0.7 million decrease) as a result of two vendor design reviews having been completed in 2013–14.

2014–15 revenues of \$104.8 million were \$6.7 million (6.0%) lower than planned revenue of \$111.5 million reported in the *Future-Oriented Financial Statements* (FOFS).

The variance is primarily due to the overall reduction in CNSC expenses, which were lower than initially budgeted, as well as a reduction in Hydro-Québec regulatory efforts. Since planned RAP revenues are forecasted based on budgeted costs, and earned revenues are calculated based on actual costs, the overall reduction in costs managed by the CNSC, as opposed to budgeted costs, resulted in lower revenues than initially planned.



In addition, revenues earned through special projects were lower than budgeted as a result of two projects being placed on hold and lower spending on one project than originally anticipated.

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 activities that are subject to cost recovery and the available parliamentary funding.

Total CNSC expenses increased to \$153.9 million in 2014–15 from \$149.1 million in 2013–14, for a net increase of \$4.8 million (3.2%).

The increase in total expenses was mainly the result of the one-time adjustment to severance liability recorded in 2013–14, following the Government's decision to allow employees to cash out severance benefits. This adjustment resulted in a significant decrease in the CNSC's severance liability in 2013–14 and an important reduction recorded against the salaries and employee benefits expenses. As the severance liability adjustment was less significant in 2014–15, the result is a net increase in salaries and employee benefits in 2014–15 compared to 2013–14.

In addition, professional and special services expenses increased in 2014–15 following the write-off of work-in-progress software costs (\$1.1M), which had been capitalized to date.

The above increases were partially offset by a decrease in amortization expenses as three leasehold improvements (total value of approximately \$1.0 million) had become fully amortized in 2013–14.

Total 2014–15 expenses of \$153.9 million were \$3.6 million (2.3%) less than planned expenses of \$157.5 million. The variance is mainly due to salaries and employee benefits which were lower than originally forecasted as a result of staffing delays, and lower cost of services provided without charge by other departments than initially forecasted.

PARLIAMENTARY APPROPRIATIONS

NET COST OF OPERATIONS

Parliamentary appropriations are used to fund some activities and certain types 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 2014–15 the CNSC's net cost of operations funded by government funding and transfers, including voted appropriations (vote 1- Program expenditures), was \$49.1 million, a \$3.5 million increase over the previous year. The increase is mainly attributable to an increase in severance expenses, an increase in costs related to licences provided free of charge as a result of increased effort for non-power reactors, and an increase in the cost of non-licensing activities.

OUTLOOK

The total projected revenues for 2015–16 are at \$109.9 million, up from \$104.8 million in 2014–15, for a net increase of \$5.1 million (4.9%) due to an increase in regulatory effort. The total projected expenses for 2015–16 are \$161.1 million, up \$7.2 million (4.7%) from \$153.9 million spent in 2014–15, as a result of the projected increase in regulatory effort.

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. Over the past year, the CNSC has undertaken an extensive review of its strategic planning framework to reflect the important changes taking place in the nuclear sector in order to reflect and anticipate the needs of a changing industry.

CNSC MANAGEMENT TEAM



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

Marc Leblanc
Commission
Secretary

Lisa Thiele
Senior General
Counsel

Terry Jamieson
Vice-President,
Technical
Support Branch

Michael Binder
President and
Chief Executive
Officer

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

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

ANNEX A: COMMISSION HEARINGS AND OPPORTUNITIES TO BE HEARD

PUBLIC HEARINGS

NUCLEAR POWER PLANTS

Ontario Power Generation Inc.:

- Decision to remove the hold point associated with licence condition 16.3 of the Pickering Nuclear Generating Station power reactor operating licence to allow the reactors to operate beyond 210,000 hours – Public hearing (May 7, 2014)
- Decision to amend the power reactor operating licence for the Darlington Nuclear Generating Station located – Public hearing (July 25, 2014)

Bruce Power Inc.:

- Application to renew the reactor operating licence for the Bruce A and B Nuclear Generating Stations – Public hearing, Part I (February 5, 2015)

SUBSTANCE PROCESSING FACILITY

Best Theratronics, Ltd.:

- Decision to issue a Class 1B nuclear substance processing facility operating licence for the Best Theratronics facility in Ottawa, Ontario – Public hearing (May 8, 2014)

RESEARCH REACTOR

McMaster University:

- Decision to renew the non-power operating licence for the McMaster Nuclear Reactor located on the university campus in Hamilton, Ontario – Public hearing (May 8, 2014)

WASTE SUBSTANCES

Saskatchewan Research Council:

- Decision to accept the Environmental Assessment Report presented by CNSC staff, and to issue to the Saskatchewan Research Council a waste nuclear substance licence for its Gunnar Remediation Project in Northern Saskatchewan – Public hearing (November 6, 2014)

ABRIDGED HEARINGS

Abridged hearings are held to deal with decisions that are administrative in nature or when licence amendments requested are less significant. They provide greater efficiency and speed of process while ensuring safety as the key consideration.

Bruce Power Inc.:

- Bruce A and B Nuclear Generating Stations – Licence amendment: Bruce Power requested an extension of the expiry date of the current power reactor operating licences by seven months to allow suitable adjustment of the public hearing schedule, to provide a more fulsome public discussion; Bruce Power also requested the correction of typographical errors regarding derived release limits, in appendix C of the Bruce B operating licence (April 24, 2014)

Atomic Energy of Canada Limited:

- Chalk River Laboratories – Licence amendment: Due date for licence condition 16.3 extended from June 30, 2014 to June 30, 2015 (May 14, 2014)

Sunnybrook Health Sciences Centre and Sunnybrook Research Institute:

- Sunnybrook Health Sciences Centre – Confirmation of designated officer order: Perform inventory, provide written procedures, prepare training plan and conduct a physical search (May 20, 2014)

Ontario Power Generation:

- Darlington Nuclear Generating Station – Licence amendment: One-year extension (July 14, 2014)

Cameco Corporation:

- Key Lake Extension Project – Acceptance of environmental assessment report (July 16, 2014)

Atomic Energy of Canada Limited:

- Douglas Point Waste Management Facility (WMF), Gentilly-1 WMF, Nuclear Power Demonstration WMF – Replace and consolidate three waste facility operating licences (July 16, 2014)

Hydro-Québec:

- Gentilly-2 – Licence amendment to reflect the current defuelled core state and the transition to safe storage of the Gentilly-2 Nuclear Generating Station (July 22, 2014)

Nordion (Canada) Inc.:

- Nordion Nuclear Substance Processing Facility – Transfer of licence to a new corporate identity of the same name following Nordion's acquisition by STHI Holding Corp. (Sterigenics) (July 7, 2014)
- STHI Holding Corp administrative monetary penalty review (September 12, 2014)

Anode NDT Ltd.:

- Administrative monetary penalty review (September 12, 2014)

Breton N.D. Testing Incorporated:

- Administrative monetary penalty review (September 12, 2014)

Hydro-Québec:

- Gentilly-2 – Commission's revised record of proceeding to adapt the regulatory requirements because of the Gentilly-2 decommissioning, and remove certain licence conditions that no longer apply to Gentilly-2's new status; licence also amended the obligations set out in regulatory document S-99, *Reporting Requirements for Operating Nuclear Power Plants*, and licence condition 4.6 (September 16, 2014)

Bruce Power Inc.:

- Bruce B Nuclear Generating Station – Temporary approval to operate units 5 and 6 beyond 210,000 equivalent full-power hours (September 16, 2014)

NB Power Nuclear:

- Point Lepreau Nuclear Generating Station – Licence amendment to update the unsealed source maximum quantities for activation products and fission products (October 3, 2014)

Atomic Energy of Canada Limited:

- The Commission approved the transfer of five licences from Atomic Energy of Canada Limited to the new entity, Canadian Nuclear Laboratories Limited; in addition, the Commission approved two specific exemptions (October 22, 2014)

Canadian Air Transport Security Authority:

- Administrative monetary penalty review (December 12, 2014)

Ontario Power Generation Inc., Bruce Power Inc., NB Power Nuclear:

- Darlington and Pickering, Bruce A and B, and Point Lepreau – Licence amendment to replace reference to S-99, *Reporting Requirements for Operating Nuclear Power Plants*, with REGDOC-3.1.1, *Reporting Requirements of Nuclear Power Plants* (December 22, 2014)

Ontario Power Generation:

- Darlington Nuclear Generating Station – RD-310, *Safety Analysis for Nuclear Power Plants*, and regulatory standard S-294, *Probabilistic Safety Analysis (PSA) for Nuclear Power Plants*, replaced with REGDOC-2.4.1, *Deterministic Safety Analysis*, and REGDOC-2.4.2, *Probabilistic Safety Analysis (PSA) for Nuclear Power Plants* (December 22, 2014)

Cameco Corporation:

- Key Lake Operation – Approval of revised preliminary decommissioning plan and cost estimate, and for acceptance of revision to the financial guarantee (January 15, 2015)

Best Theratronics, Ltd.:

- Medical device manufacturing – Licence amendment to extend the date to have a financial guarantee from January 31, 2015 to April 30, 2015, and to implement the non-safe state component of the financial guarantee through a letter of credit, rather than through a surety bond (January 30, 2015)

Best Theratronics, Ltd.:

- Medical device manufacturing – Licence amendment for approval of the form and amount of the financial guarantee, as well as the schedule to fund the financial guarantee (March 25, 2015)

Canadian Light Source Inc.:

- Class IB synchrotron facility – Licence amendment for a change of address on the particle accelerator operating licence and to allow the processing of nuclear substances at the facility (March 30, 2015)

Various specific nuclear substances, prescribed equipment and Class II nuclear facility licensees:

- Licence amendments for nuclear substances, prescribed equipment and Class II nuclear facilities to include requirements for financial guarantees for licensed activities and to refer to the CNSC's regulatory document REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources* (January 16, 2015)

MEETINGS

Opportunities to be heard

- The public was invited to comment, in writing, on the *CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants for 2013* (2013 NPP Report) – Commission meeting (August 20, 2014)
- The public was invited to comment, in writing, on the *CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013* and the *CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013* – Commission meeting (October 2, 2014)
- The public was invited to comment, in writing, on the *Annual Performance Report, AECL's Nuclear Sites and Projects: 2013* – Commission meeting (October 15, 2014)

ANNEX B: REGULATORY FRAMEWORK PROJECTS PUBLISHED OR COMPLETED IN 2014–15

REGULATIONS AMENDING CERTAIN REGULATIONS MADE UNDER THE NUCLEAR SAFETY AND CONTROL ACT

In June 2014, the Canadian Nuclear Safety Commission made *Regulations Amending Certain Regulations Made Under the Nuclear Safety and Control Act* to clarify certain requirements and correct a number of minor inconsistencies raised by the Standing Joint Committee for the Scrutiny of Regulations. His Excellency the Governor General in Council, on the recommendation of the Minister of Natural Resources, approved the Regulations made by the Commission and the Regulations were published in the *Canada Gazette*, Part II in March 2015.

REGDOC-2.2.2, *PERSONNEL TRAINING*

REGDOC-2.2.2, *Personnel Training*, was published in August 2014. It sets out requirements and guidance for the analysis, design, development, implementation, evaluation, documentation and management of training at nuclear facilities in Canada, including the essential principles and elements of an effective training system.

The training system supports the organization's operational capability by training workers to perform their jobs effectively. It also permits organizations to respond rapidly when a performance or personnel issue can best be addressed by training.

REGDOC-2.2.3, *PERSONNEL CERTIFICATION: RADIATION SAFETY OFFICERS*

REGDOC-2.2.3, *Personnel Certification: Radiation Safety Officers*, was published in July 2014. It sets out guidance to assist applicants in completing an application for certification as a radiation safety officer pursuant to the *Class II Nuclear Facilities and Prescribed Equipment Regulations*.

REGDOC-2.3.2, *ACCIDENT MANAGEMENT*

REGDOC-2.3.2, *Accident Management*, was published in October 2014. It sets out the requirements and guidance for the development, implementation and validation of accident management programs for reactor facilities.

This document supersedes REGDOC-2.3.2, *Severe Accident Management Programs for Nuclear Reactors*, which was published in September 2013. It reflects lessons learned from the Fukushima nuclear event of March 2011, and addresses findings from the CNSC *Fukushima Task Force Report*.

REGDOC-2.4.1, *DETERMINISTIC SAFETY ANALYSIS*

REGDOC-2.4.1, *Deterministic Safety Analysis*, was published in May 2014. It sets out requirements and guidance for the preparation and presentation of a safety analysis that demonstrates the safety of a nuclear facility. This document provides information on preparing and presenting deterministic safety analysis reports, including the selection of events to be analyzed, acceptance criteria, safety analysis methods, safety analysis documentation, and the review and update of safety analysis.

REGDOC-2.4.1 supersedes the following three documents: RD-310, *Safety Analysis for Nuclear Power Plants* (published in February 2008);

GD-310, *Guidance on Safety Analysis for Nuclear Power Plants* (published in March 2012); and RD-308, *Deterministic Safety Assessment for Small Reactor Facilities* (published in June 2011).

This document reflects lessons learned from the Fukushima nuclear event of March 2011, and addresses findings from the *CNSC Fukushima Task Force Report*, as applicable to RD-310 and RD-308.

REGDOC-2.4.2, *PROBABILISTIC SAFETY ASSESSMENT FOR NUCLEAR POWER PLANTS*

REGDOC-2.4.2, *Probabilistic Safety Assessment for Nuclear Power Plants*, was published in May 2014. It sets out requirements for probabilistic safety assessment, and supersedes S-294, *Probabilistic Safety Assessment for Nuclear Power Plants*, which was published in April 2005.

REGDOC-2.4.2 reflects lessons learned from the Fukushima nuclear event of March 2011, and addresses findings from the *CNSC Fukushima Task Force Report*.

REGDOC-2.5.2, *DESIGN OF REACTOR FACILITIES: NUCLEAR POWER PLANTS*

REGDOC-2.5.2, *Design of Reactor Facilities: Nuclear Power Plants*, was published in May 2014. It sets out requirements and guidance for new licence applications for water-cooled nuclear power plants. The document establishes a set of comprehensive, risk-informed design requirements and guidance that align with accepted international codes and practices. REGDOC-2.5.2 supersedes RD-337, *Design of New Nuclear Power Plants*, which was published in 2008.

The document implements recommendations from the *CNSC Fukushima Task Force Report*.

REGDOC-2.10.1, *NUCLEAR EMERGENCY PREPAREDNESS AND RESPONSE*

REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, was published in October 2014. It sets out emergency preparedness requirements and guidance for the development of emergency measures, for licensees and licence applicants of Class I nuclear facilities and uranium mines and mills. REGDOC-2.10.1 lists and discusses the requirements and guidance that licence applicants and licensees shall implement and consider in the design of their emergency preparedness programs. REGDOC-2.10.1 supersedes G-225, *Emergency Planning at Class I Nuclear Facilities and Uranium Mines and Mills* (published in 2001) and RD-353, *Testing the Implementation of Emergency Measures* (published in 2008).

This document fulfills a recommendation made by the CNSC Fukushima Task Force and the External Advisory Committee to strengthen licensees' emergency preparedness programs.

REGDOC-3.1.1, *REPORTING REQUIREMENTS FOR NUCLEAR POWER PLANTS*

REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, was published in May 2014. It sets out the timing and information that nuclear power plant licensees are required to report to the CNSC, to support the conditions of applicable power reactor operating licences. This document presents the types of reports, their frequency and applicable reporting timeframes. It also contains guidance, explanatory information, forms and templates to help users meet reporting requirements. REGDOC-3.1.1 supersedes S-99, *Reporting Requirements for Operating Nuclear Power Plants*, which was published in March 2003.

DIS-14-01, *DESIGN EXTENSION CONDITIONS FOR NUCLEAR POWER PLANTS*

In August 2014, the CNSC published a discussion paper, DIS-14-01, *Design Extension Conditions for Nuclear Power Plants*, to summarize the CNSC's current understanding of design-extension conditions (DECs). This paper, based largely on REGDOC-2.5.2, *Design of Reactor Facilities: Nuclear Power Plants*, aimed to establish dialogue with stakeholders on DECs and arrive at a common understanding of associated terminology and the application of the concept of DECs.

Discussion was invited, in part, to respond to the CNSC Fukushima Task Force's recommendations and to clarify the basis for any regulatory changes that may be needed for DECs.

DIS-14-02, *MODERNIZING THE CNSC'S REGULATIONS*

In December 2014, the CNSC published a discussion paper seeking early feedback from licensees, the Canadian public and other stakeholders with an interest in the CNSC's regulatory modernization project. The CNSC initiated a review of its body of regulations to verify that they continue to be clear, effective, and structured as efficiently as possible. The discussion paper invited stakeholder input to help the CNSC assess the need to further refine its regulations.

DIS-15-01, *NUCLEAR NON-PROLIFERATION IMPORT AND EXPORT CONTROL REGULATIONS*

In March 2015, the CNSC published a discussion paper seeking feedback from licensees, the Canadian public and other interested stakeholders on proposed amendments to the *Nuclear Non-proliferation Import and Export Control Regulations*, along with a related change to the *General Nuclear Safety and Control Regulations*. The discussion paper sought input on the proposed amendments to the regulations, most of which are based on changes to the Nuclear Suppliers Group (NSG) lists approved by NSG Participating Governments, including Canada. These proposed changes aimed to help ensure continued effective regulation of the Canadian nuclear exporting and importing industry, and to address some technical and administrative issues related to the regulations.

ANNEX C: ORDERS AND ADMINISTRATIVE MONETARY PENALTIES ISSUED TO LICENSEES IN 2014–15

ORDERS

DATE ISSUED: MARCH 12, 2015

Date Resolved: March 19, 2015

Licensee: Big Guns Energy Services Inc.

Issue: The order was issued following a CNSC inspection at the company's location in Red Deer, Alberta. The CNSC inspector identified that the company was not complying with a number of regulatory requirements, including the correct labelling of its packages used to transport radioactive materials, maintenance of training records for its workers, and the effective implementation of its radiation protection program.

DATE ISSUED: FEBRUARY 23, 2015

Date Resolved: March 2, 2015

Licensee: Montreal Neurological Institute and Hospital

Issue: The order required the Montreal Neurological Institute and Hospital to cease the production of radiolabelled tracers until a sufficient number of trained and qualified workers were in place and a radiation monitor was installed in the production area. The order also required the licensee to cease processing any radioisotopes until it had implemented adequate controls to prevent radioactive contamination.

DATE ISSUED: JANUARY 28, 2015

Date Resolved: January 29, 2015

Licensee: Babcock & Wilcox Canada Ltd.

Issue: The order was issued following a CNSC inspection at the company's location in Melville, Saskatchewan. The CNSC inspector observed that the company was unable to demonstrate that the exposure devices in use at this location were being maintained in accordance with manufacturer specifications and CNSC licence conditions.

DATE ISSUED: DECEMBER 16, 2014

Date Resolved: January 15, 2015

Licensee: Nine Energy Canada Inc.

Issue: The order was issued on December 16, 2014, following a CNSC inspection at the company's location in Red Deer, Alberta. The inspection identified a number of non-compliances with CNSC requirements, including Nine Energy Canada Inc.'s failure to adequately implement its radiation safety program.

DATE ISSUED: OCTOBER 14, 2014

Date Resolved: Unresolved as of March 31, 2015

Licensee: Fort McMurray Inspection and Testing Inc.

Issue: The order was issued on October 14, 2014, following a CNSC inspection at the company's location in Fort McMurray. The inspection identified a number of non-compliances related to the company's radiation protection program for nuclear gauges. The inspection also revealed that not all workers were adequately trained to conduct the activities authorized under the licence.

DATE ISSUED: SEPTEMBER 11, 2014

Date Resolved: September 29, 2014

Licensee: Marsh Instrumentation Inc.

Issue: The order was issued on September 11, 2014, following an onsite inspection that revealed that Marsh Instrumentation possessed a radiation device without a CNSC licence.

DATE ISSUED: JULY 29, 2014

Date Resolved: August 14, 2014

Licensee: Parkland Geotechnical Consulting Ltd.

Issue: The order was issued on July 29, 2014, following a CNSC inspection at a location in Medicine Hat. The inspection identified many non-compliances related to the requirements for transport of nuclear gauges. The inspection also revealed that not all workers were adequately trained to safely conduct the activities authorized under the licence.

DATE ISSUED: JULY 22, 2014

Date Resolved: September 12, 2014

Licensee: Mistras Canada Inc.

Issue: The order was issued on July 22, 2014, following a CNSC inspection near Grande Prairie, Alberta, where workers were conducting radiography operations unsafely. The inspector noted an exposure device operator-in-training who was performing radiography work without supervision. Other observations included workers failing to perform required exposure device safety checks and failing to use required safety equipment.

DATE ISSUED: JUNE 5, 2014

Date Resolved: July 16, 2014

Licensee: Paladin Inspection Services Ltd.

Issue: The order was issued on June 5, 2014, following a CNSC inspection at a location near Fort St. John, where workers were conducting radiography operations unsafely. The inspector's observations included an exposure device operator-in-training performing unsupervised radiography work, and workers failing to use required safety equipment.

DATE ISSUED: JUNE 4, 2014

Date Resolved: June 24, 2014

Licensee: Pump House Brewery

Issue: The order was issued on June 4, 2014, following a CNSC inspection at the company's location in Moncton. The inspection identified several non-compliances related to safety requirements for nuclear gauges. The inspection also revealed that a nuclear gauge had been repeatedly installed and removed without CNSC authorization.

DATE ISSUED: MAY 29, 2014

Date Resolved: June 30, 2014

Licensee: AR Geotechnical Engineering Ltd.

Issue: The order was issued on May 29, 2014, following a CNSC inspection at the company's location in Medicine Hat. The inspection identified a number of non-compliances related to the requirements for transport of nuclear gauges. The inspection also revealed that not all workers were adequately trained to conduct the activities authorized under the licence.

DATE ISSUED: MAY 1, 2014

Date Resolved: July 10, 2014

Licensees: Sunnybrook Health Sciences Centre and Sunnybrook Research Institute

Issue: The order was issued on May 1, after Sunnybrook Health Sciences Centre and Sunnybrook Research Institute reported that they had transferred 25 low-risk sealed radioactive sources to locations not authorized by a CNSC licence, resulting in the loss of the sources. These unauthorized transfers indicated that the licensees had failed to maintain management control over work practices, as required by the *Radiation Protection Regulations*, and had not taken all reasonable precautions to protect the environment, health and safety of persons, and to maintain security of nuclear substances, as required by the *General Nuclear Safety and Control Regulations*.

THE FOLLOWING ORDERS WERE ISSUED IN 2013–14 BUT RESOLVED IN 2014–15

DATE ISSUED: MARCH 21, 2014

Date Resolved: January 20, 2015

Licensee: Cliffs Quebec Iron Mining Limited

Issue: The order was issued on March 21, 2014, following the review of an incident that Cliffs Quebec Iron Mining Limited reported to the CNSC on March 20. The incident likely caused approximately 16 workers to be exposed to radiation from two gauges in excess of the regulatory dose limit of 1mSv for members of the public. The gauges had not been locked in the closed position

DATE ISSUED: MARCH 17, 2014

Date Resolved: June 10, 2014

Licensee: Anode NDT Ltd.

Issue: The order was issued on March 17, 2014, following a CNSC inspection where workers were operating an exposure device unsafely. Observations included an exposure device operator-in-training performing radiography work without supervision, a lack of appropriate pre-operational checks on equipment, and the absence of required onsite emergency equipment.

DATE ISSUED: FEBRUARY 20, 2014

Date Resolved: August 15, 2014

Licensee: Breton N.D. Testing Inc.

Issue: The order was issued on February 20, 2014, following a CNSC inspection in Fort MacKay, Alberta. During the inspection, a worker was observed operating an exposure device unsafely. The worker did not perform appropriate pre-operational checks on equipment, post-emergency contact information or possess and properly use radiation safety equipment.

ADMINISTRATIVE MONETARY PENALTIES

DATE ISSUED: FEBRUARY 9, 2015

Date Resolved: March 3, 2015

Licensee: Alberta Health Services

Amount: \$7,630

Issue: The licensee knowingly withheld information from the Commission about the loss of control of two sealed sources. This action constituted a violation under paragraph 48(d) of the *Nuclear Safety and Control Act* (knowingly making a false or misleading statement to the Commission).

DATE ISSUED: FEBRUARY 6, 2015

Date Resolved: March 3, 2015

Licensee: Isologic Innovative Radiopharmaceuticals Ltd.

Amount: \$2,170

Issue: The licensee delivered a number of packages that were contaminated above the CNSC regulatory limit. This resulted in a failure to comply with subsection 16(4) of the *Packaging and Transport of Nuclear Substances Regulations* (failure of consignor or carrier to act in accordance with paragraphs 501 to 547 of the *IAEA Regulations for the Safe Transport of Radioactive Material*).

DATE ISSUED: JANUARY 29, 2015

Date Resolved: February 6, 2015

Licensee: University of Western Ontario

Amount: \$1,000

Issue: The licensee had transferred a radiation device to a person who does not hold a CNSC licence. As a result, the University of Western Ontario failed to comply with section 13 of the *General Nuclear Safety and Control Regulations*.

DATE ISSUED: JANUARY 28, 2015

Date Resolved: January 29, 2015

Licensee: Babcock & Wilcox Canada Ltd.

Amount: \$7,930

Issue: The licensee demonstrated negligence in resolving the non-compliance items identified during the inspection. This negligence represented a violation of paragraph 48(f) of the *Nuclear Safety and Control Act* (failure to assist or give information requested by an inspector).

DATE ISSUED: DECEMBER 8, 2014

Date Resolved: January 27, 2015

Licensee: RSB Logistics Inc.

Amount: \$3,730

Issue: The licensee transported nuclear substances by road, in a manner that was not compliant with its existing licence. This resulted in a failure to comply with section 26 of the *Nuclear Safety and Control Act* (carrying on a prescribed activity without – or contrary to – a licence).

DATE ISSUED: NOVEMBER 4, 2014

Date Resolved: November 24, 2014

Licensee: Westcoast Energy Inc.

Amount: \$4,900

Issue: The licensee used prescribed equipment in an unlicensed location, resulting in a failure to comply with section 26 of the *Nuclear Safety and Control Act* (carrying on a prescribed activity without or contrary to a licence).

DATE ISSUED: SEPTEMBER 4, 2014

Date Resolved: February 11, 2015

Licensee: Canadian Air Transport Security Authority

Amount: \$4,900

Issue: The licensee stored radiation devices in several unlicensed locations, resulting in a failure to comply with section 26 of the *Nuclear Safety and Control Act* (carrying on a prescribed activity without or contrary to a licence). CATSA appealed its administrative monetary penalty. The Commission issued its decision on January 12, 2015, and reduced the amount payable to \$2,170.

DATE ISSUED: SEPTEMBER 3, 2014

Date Resolved: September 12, 2014

Licensee: Nordion (Canada) Inc.

Amount: \$24,760

Issue: The company failed to comply with condition 2.2 of an export licence, which requires the licensee to notify the CNSC following the shipment of Category 1 radioactive sources abroad.

DATE ISSUED: MAY 8, 2014

Date Resolved: July 10, 2014

Licensee: Sunnybrook Health Sciences Centre

Amount: \$3,730

Issue: The institution transferred 25 low-risk sealed radioactive sources to locations not authorized by a CNSC licence, resulting in loss of the sources. This was a failure to comply with paragraph 12(1)(c) of the *General Nuclear Safety and Control Regulations*.

DATE ISSUED: APRIL 25, 2014

Date Resolved: May 28, 2014

Licensee: Anode NDT Ltd.

Amount: \$2,540

Issue: The company failed to comply with section 32 of the *Nuclear Substances and Radiation Devices Regulations* (Appointment of Supervisors of Trainees). Anode NDT Ltd. appealed its AMP. The Commission issued its decision on October 9, 2014 and reduced the amount payable to \$2,100.

DATE ISSUED: APRIL 14, 2014

Date Resolved: November 11, 2014

Licensee: Mr. Corey Wells

Amount: \$1,658

Issue: The licensee did not comply with paragraph 17(a) of the *General Nuclear Safety and Control Regulations* (Obligations of Workers). At the time of the incident in question, Mr. Wells was an employee of Breton N.D. Testing Inc., a company based in Reserve Mines, Nova Scotia, which provides testing services to the industrial sector.

DATE ISSUED: APRIL 14, 2014

Date Resolved: Oct. 29, 2014

Licensee: Breton ND Testing Inc.

Amount: \$6,640

Issue: The company failed to comply with subparagraph 4(a)(i) of the *Radiation Protection Regulations* (Radiation Protection Programs). The penalty followed an order issued to the licensee on February 20, 2014, further to a CNSC inspection in Fort MacKay, Alberta. Breton ND Testing Inc. appealed its AMP. On October 9, 2014 the Commission issued its decision and reduced the amount payable to \$4,900.

ANNEX D: STAKEHOLDER ENGAGEMENT ACTIVITIES

The dissemination of objective, scientific and technical information is part of the Canadian Nuclear Safety Commission (CNSC) mandate. This objective is fulfilled by engaging stakeholders in meaningful dialogue on issues such as relicensing and waste, and by reaching out to new audiences to build their knowledge of the CNSC and its regulatory mandate. Whether it be classroom presentations, conferences or meetings with licensees, the CNSC’s outreach activities are meant to demystify nuclear science, describe the CNSC’s role as Canada’s nuclear regulator and bring a “CNSC face” into communities across the country.

In 2014–15, the CNSC actively participated in 167 outreach activities from coast to coast to coast that not only involved its current stakeholders, but also focused on informing Canada’s youth about the importance of nuclear safety.

OVERVIEW OF CNSC OUTREACH ACTIVITIES IN 2014–15:

Some of the 167 outreach activities completed this past year included:

- 13 youth-related events
- 13 waste-related events
- 41 events that focused directly on CNSC licensees
- 11 events that focused on communities with nuclear facilities
- 8 events related to environmental issues
- 7 medical-related events

Here some details on some specific noteworthy outreach activities.

CNSC 101

The CNSC 101 program, launched in 2010, 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.

Session location	Number of participants
Public Safety Canada (Ottawa, ON)	35
Hagersville Aboriginal community (Hagersville, ON)	32
Women in Nuclear (Saint John, NB)	15
Saint John, NB	15
Pembroke, ON	18
Kiggavik Working Group (Ottawa, ON and webinar)	30
Iqaluit, NU	20
Coral Harbour, NU	57
Baker Lake, NU	92
Chesterfield Inlet and Rankin Inlet, NU	22
Ottawa, ON	21
Kincardine, ON	9
Total	366

CNSC 101 NORTHERN TOUR

From February 1 to 6, 2015, the CNSC 101 team visited five communities in Nunavut, meeting with elders, students, mayors and other community and government representatives in Iqaluit, Coral Harbour, Baker Lake, Chesterfield Inlet and Rankin Inlet. Over five days, the team met with almost 200 residents. The goal of the visit was to provide an overview of the CNSC's role and mandate in support of the Kiggavik Uranium Mine project and build public confidence in the CNSC as a nuclear regulator.

MEETING WITH THE DURHAM HEALTH COMMITTEE

The objective of the meeting was to provide an overview of CNSC's 2013 Nuclear Power Industry Safety Performance Report for Pickering and Darlington and to give highlights of the public hearing that was to be held on May 7, 2014 to consider Ontario Power Generation's request to remove the hold point licence condition at the Pickering Nuclear Generating Station. The event was attended by members of the public, regional officers and non-government organizations. Topics of discussion included the Darlington refurbishment, end-of-life for the Pickering nuclear power plant and the pre-distribution of potassium iodide pills.

ADAPTIVE PHASED MANAGEMENT OUTREACH

The CNSC has been meeting with the communities involved in the Nuclear Waste Management Organization's "learn more" process, to help them better understand the safety and regulatory matters that would be examined for a used nuclear fuel repository if the CNSC were to receive an application. In 2014–15, at the request of community representatives, the CNSC met with the Ontario communities of Elliot Lake, Spanish, Blind River and the Township of the North Shore as well as the community of Creighton, Saskatchewan.

The CNSC also held five open houses in the Ontario communities of Hornepayne, the Township of Huron-Kinloss, Elliot Lake and Spanish. In addition, two Aboriginal groups requested a meeting with the CNSC to learn more about its regulatory role.

OUTREACH TOOLS

The CNSC continues to develop and produce communication products to inform its various publics. Outreach tools include videos that explain the medical and industrial uses of nuclear technologies, radiation and health, nuclear power plant refurbishment, nuclear in your neighbourhood, as well as online modules and infographics on waste, nuclear power plants, nuclear medicine and radiation.

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 2014–15 and can be found on the CNSC website at nuclearsafety.gc.ca.

Canadian Nuclear Safety Commission Annual Report 2013–14

National Sealed Source Registry and Sealed Source Tracking System – Annual Report 2013

CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities: 2013

CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013

CNSC Staff Integrated Safety Assessment of Canadian Nuclear Power Plants for 2013

Report on Plans and Priorities 2015–16

Annual Performance Report, AECL's Nuclear Sites and Projects: 2013

CNSC Research Report 2013–14

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NUCLEARSAFETY.GC.CA

For more information about the Canadian nuclear sector, visit the CNSC website, where you'll find:

- more about the CNSC and its role in nuclear safety
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- 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
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