Canadian Nuclear Safety Commission

2020–21

Departmental Plan

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Minister of Natural Resources

Departmental Plan
Canadian Nuclear Safety Commission

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From the President

I am pleased to present the 2020–21 Departmental Plan of the Canadian Nuclear Safety Commission (CNSC), which informs parliamentarians and Canadians about our work and the results we aim to achieve during the upcoming fiscal year.

Our efforts to fulfill our mandate and demonstrate results are guided by four organizational priorities:

- to have a modern approach to nuclear regulation
- to be a trusted regulator
- to maintain our global nuclear influence
- to be an agile organization

The CNSC is committed to a modern approach to nuclear regulation using science-based and risk-informed regulatory practices and a regulatory framework that take into account scientific uncertainties, an evolving industry and changing regulatory expectations. In 2020–21, the CNSC will maintain focus on its regulatory oversight of the refurbishment of the Darlington and Bruce nuclear generating stations, verifying that the projects are carried out safely and that the required safety improvements are implemented. In addition, the CNSC will lead environmental assessments for two new proposed uranium mining projects in Saskatchewan, along with three environmental assessments for Canadian Nuclear Laboratories (CNL). The CNSC will continue reviewing the Whiteshell decommissioning, the Nuclear Power Demonstration Closure Project and the recently revised environmental impact statement for CNL’s proposed near surface disposal facility project in Deep River.

The CNSC will keep independently conducting vendor design reviews of new small modular reactor (SMR) designs proposed by vendors who have formally submitted their technical designs for pre-licensing review against Canadian regulatory requirements. These reviews contribute to the CNSC’s modern approach by ensuring its readiness to regulate innovation as it rapidly becomes a reality in the nuclear sector. The CNSC will also lead the environmental assessment for the first application for a licence to prepare a site in Canada for a proposed SMR project at Chalk River Laboratories in Ontario, submitted in March 2019. It is important that the CNSC keeps regulating the industry responsibly now, while ensuring readiness for the future.

The CNSC always strives to be a trusted regulator that is recognized as independent, competent and transparent, and as a credible source of scientific, technical and regulatory information. We will aim to strengthen public trust in nuclear regulatory oversight by being even more transparent in our efforts and with our information. As always, we will actively listen to concerned parties and interact with a variety of different audiences, including the Canadian public, civil society

organizations, non-governmental organizations, Indigenous peoples, and our domestic and international counterparts.

In our efforts to be a trusted regulator, the CNSC must continue to engage with our stakeholders and build relationships to earn and maintain public confidence. In many cases, we are meeting their expectations, but we can always do better. In 2020–21, the CNSC will further develop and implement an overarching strategy to support our role as a trusted regulator.

The CNSC will maintain its global nuclear influence by leveraging and influencing global nuclear efforts that are relevant to Canadian interests and activities in order to enhance international nuclear safety, security and non-proliferation. The CNSC will develop and foster partnerships with other nuclear regulators on priority topics, such as new reactor technologies.

The CNSC will also take the necessary steps to ensure that it is an agile, flexible and inclusive organization with an empowered and equipped workforce able to quickly adapt to an evolving operating environment. Implementing our digital strategy will ensure we are an open, digital, evidence-based regulatory organization that embraces the rapid pace of technological change to ensure modern, effective and secure interactions with licensees, Indigenous peoples, the public and stakeholders.

Further, the CNSC believes that diversity and inclusion are fundamental to our regulatory culture for safety and critical to fostering innovation, solving complex issues and improving our results for Canadians. We have made an effort to promote careers in science, technology, engineering and mathematics – or STEM disciplines – because we know the best way to adapt to a changing world is to infuse our industry with new energy and new perspectives. This means attracting the best and brightest people, reflecting all of Canadian society. To this end, we will carry out the actions in our new diversity and inclusion plan to build on our inclusive, accessible workplace where employees feel respected and safe – physically, psychologically and intellectually.

Thank you to the CNSC’s highly skilled, professional staff who are dedicated in their efforts to regulate Canada’s nuclear industry and committed to keeping the environment and Canadians safe. I look forward to working with them, in the years to come, to achieve our shared goal of being one of the world’s best nuclear regulators. Rest assured that we will remain true to our goals and keep enforcing the highest safety standards.

Original signed by (Jan. 08, 2020)

Rumina Velshi
President

Plans at a glance

The commitment to the CNSC's core responsibility of nuclear regulation, the fulfillment of its mandate and the achievement of its Departmental Results for 2020–21 and beyond are delivered through its five programs (plus Internal Services) that are guided by four strategic priorities.

The CNSC is committed to a **modern** approach to nuclear regulation using science-based and risk-informed regulatory practices and regulatory framework that take into account scientific uncertainties, an evolving industry and changing regulatory expectations.

There is a growing gap between technology, which continues to advance at a rapid pace, and government's pace of policy and regulation adoption. In the context of the CNSC, regulation will need to account for any number of industry-neutral disruptive, innovative and emerging technologies that may impact regular operations in the nuclear industry in the coming years. For example, drones, robotics and artificial intelligence are being used to assist forms of safety inspections in different types of industrial plants, on construction sites as well as in operating facilities. There are also industrial applications for additive manufactured (i.e., 3-D printed) components, for example in the automotive, medical and energy industries. These and other technologies are applied to the nuclear industry as well, and have required the CNSC to develop new approaches to regulation. The CNSC will leverage partnerships with other government departments, such as Health Canada and Transport Canada, to collaborate in our response to these technologies.

In addition, nuclear-specific technologies and processes, such as small modular reactors (SMRs) or new medical therapies, are at the forefront of innovation in the nuclear sector, and are being accounted for and analyzed within the context of the CNSC's regulatory framework. This also includes protecting the cyber and remote operations of licensees.

To address these developments, the CNSC is analyzing innovative and emerging technologies and their potential impact on the CNSC's regulatory framework. Fuel reprocessing is one of the areas of emerging technologies that the CNSC will need to explore to ensure it is ready to regulate if necessary to respond to industry demands. By maintaining awareness of the fluctuations in the operating environment and addressing them proactively, the CNSC is better equipped to keep the environment and Canadians safe.

The CNSC continuously strives to be a **trusted** regulator, recognized as independent, open and transparent, and as a credible source of scientific, technical and regulatory information.

In an era of increasing public expectations for citizen engagement, government and industry have made proactive efforts for greater openness and transparency. It is essential that the CNSC provide people who have an interest in nuclear regulation with accurate information in an accessible and usable format. Addressing these challenges is central to the CNSC's Core Responsibility of Nuclear Regulation. The CNSC has been examining this issue comprehensively with a view to developing a coherent, coordinated and focused strategy on trust building, which will continue to be an important priority in 2020–21. A key element of this approach is fresh thinking about stakeholder engagement, relationship building and transparency. The CNSC will also implement improved engagement mechanisms and forums for different partners and stakeholders such as Indigenous groups and civil society organizations. Such efforts will help the CNSC to achieve its expected result of ensuring that Canadians, including Indigenous peoples, have meaningful information about, and the opportunity to participate in, the nuclear regulatory process.

Figure 1: CNSC Executive Vice-President and Chief Regulatory Operations Officer Ramzi Jammal, Chief Lester Anoquot and Chief Greg Nadjiwon signed the Terms of Reference on May 21, 2019 at the Bruce County Museum and Cultural Centre in Southampton, Ontario.

The CNSC will continue to leverage and influence **global** nuclear efforts, relevant to Canadian interests and activities, to enhance international nuclear safety, security and non-proliferation. While nuclear energy is being phased out in some countries, it is expanding in many others, with newly developing regulatory frameworks and infrastructure. As these states adopt nuclear energy, it is more important than ever to encourage international accountability and transparency to strengthen the global nuclear safety, security and non-proliferation regimes. The CNSC fosters international accountability by supporting nascent nuclear countries in developing a regulatory infrastructure especially for SMRs.

The CNSC will have the opportunity to promote these principles in multilateral forums such as the 2020 *Convention on Nuclear Safety*[1] and through bilateral and regional efforts. In 2020–21, the CNSC will also promote improvements to International Atomic Energy Agency (IAEA) peer review processes.

On the heels of the signing of a memorandum of cooperation, the CNSC and the U.S. Nuclear Regulatory Commission are cooperating on sharing regulatory insights, starting with two technology vendors who are currently conducting engagement activities in the US and Canada: Terrestrial Energy Inc.'s Integral Molten Salt Reactor and NuScale Power's Integral Pressurized Water Reactor. In Canada, these vendors are currently undergoing vendor design reviews with the CNSC to identify any potential issues the technologies' designs may present in meeting Canadian regulatory requirements. The CNSC also identifies any issues that may present potential fundamental barriers to licensing if the vendor's design is proposed in a new build project in Canada. Collaborative activities in 2020–21 will allow comparison between U.S. and Canadian regulatory practices. Working together with the U.S. nuclear regulator allow both regulators to better leverage each others' skills and information in innovative nuclear technologies, develop common nuclear safety regulatory positions and ultimately improve efficiencies in our regulatory practices.

The CNSC will take the necessary steps to ensure that it is an **agile** organization – one that is flexible and inclusive, with an empowered and equipped workforce able to quickly adapt to an evolving operating environment. Improvements in this area support the attainment of all of the CNSC's strategic priorities and Departmental Results. Through the implementation of the digital strategy, the CNSC will focus efforts on enhancing foundational elements of its Information Management and Information Technology program, including modernizing its approach to data, digital business processes, and service delivery.

Over the years, we have taken deliberate action to build a healthy, collaborative workplace and a supportive culture for employees. Through different initiatives, we continue to raise awareness and provide employees and managers with tools to support mental wellness, reduce the stigma around issues of mental health and resolve conflicts in the workplace. The CNSC's new diversity and inclusion plan outlines ongoing and new commitments to leverage diversity and to make progress in creating a safe, inclusive workplace.

For more information on the Canadian Nuclear Safety Commission's plans, priorities and planned results, see the "Planned results" section of this report.

Planned results and resources, and key risks, for core responsibilities

This section contains detailed information on the department's planned results and resources for each of its core responsibilities. It also contains information on key risks related to achieving those results which is woven into the text.

Nuclear regulation

Description

The CNSC regulates the development, production and use of nuclear energy and substances to protect health, safety, security and the environment; implements Canada's international commitments on the peaceful use of nuclear energy; and disseminates objective scientific and regulatory information to members of the public. The CNSC maintains a regulatory framework and conducts licensing (including environmental protection reviews), compliance verification and enforcement. The CNSC is committed to building and maintaining the confidence of the public and Indigenous peoples through transparent, open and inclusive regulatory processes.

Lifecycle regulation

The CNSC is one of the only federal regulators to regulate the entire lifecycle of a project, from resource extraction, through fuel processing and power production, to decommissioning and waste management.

Planning highlights

Departmental Result 1:
The environment is protected from releases from nuclear facilities and activities.

Departmental Result 2:
Canadians are protected from radiation resulting from nuclear facilities and activities.

For the CNSC to achieve its planned results, risks must be identified, monitored and controlled across all nuclear facilities and activities by CNSC inspectors who conduct compliance verification activities for nearly 1,700 licensees across various sectors. Of note in 2020–21, the CNSC will continue to provide regulatory oversight of the Darlington Nuclear Generating Station refurbishment and the major component replacement at Bruce Nuclear Generating Station.

The CNSC will also continue performing a number of environmental assessments under the *Canadian Environmental Assessment Act, 2012*. These include the environmental assessments of Canadian Nuclear Laboratories' proposed environmental remediation projects: the siting and construction of a near surface disposal facility at Chalk River Laboratories, Ontario, and the decommissioning of the Nuclear Power Demonstration reactor in Rolphton, Ontario, as well as the decommissioning of the WR-I reactor at the Whiteshell Laboratories in Manitoba. In 2020–

21, the CNSC will undertake technical reviews of revised environmental impact statements and licensing documentation for these three environmental remediation and decommissioning projects. In addition, in 2020–21 the CNSC will also carry out environmental assessments for two newly proposed uranium mines in northern Saskatchewan. These also serve to support the Government of Canada's contribution to the United Nation's 2030 Agenda for Sustainable Development[2], especially Goal Three which focuses on Good Health and Well-Being. The CNSC works to protect the health of Canadians through regulating the nuclear industry and promoting the use of nuclear substances in ways which only promote good health such as its use in the medical industry.

In March 2019, the CNSC received a licence application for a proposed micro modular reactor at the Chalk River Laboratories site. The application is to prepare the site for a single 15 $MW_{thermal}$ high-temperature gas-cooled reactor. When undertaken, the environmental assessment will assess all of the lifecycle phases: site preparation, operation, construction, decommissioning and abandonment.

To ensure that there is consistency in licensing and compliance verification, the CNSC's regulatory framework and environmental assessment terminology must be clear and understood by licensees in support of nuclear safety. The regulatory framework consists of laws[3] passed by Parliament, regulations, licences and documents that are used to regulate Canada's nuclear industry. In this regard, particular attention will be paid in 2020–21 to the areas of waste management and decommissioning.

Managing the aging of structures, systems and components is a priority for the CNSC's regulation of nuclear power plants and facilities. As CNSC is a lifecycle regulator, applicants and vendors are required to take the aging process into account in their licensing for the design, operations and decommissioning stages. The CNSC is currently reviewing its approach to transitioning from operations to decommissioning.

Gender-based analysis plus (GBA+) in the regulatory framework
CNSC is committed to understanding the impact of regulatory framework activities on diverse groups of people. Maintaining an effective and flexible regulatory framework enables us to regulate to help ensure safety in the context of ongoing changes in the nuclear industry. The CNSC's Regulatory Framework Plan[4] provides an overall view of current and planned regulatory projects and is published online. Regulatory requirements and guidance are reviewed on a cyclical basis and undergo a thorough analysis prior to development and publication. This analysis includes GBA+ considerations. In 2019–20, GBA+ considerations were taken into account in the development of proposed amendments to our *Radiation Protection Regulations*. The CNSC focused on the changes that could have unintended impacts on different groups such as female nuclear energy workers and breastfed infants.

Power reactors apply a defence-in-depth approach that involves multiple layers and redundancies in the anticipation and mitigation of potential challenges caused by both internal and external events. In addition to its ongoing robust regulatory oversight of existing facilities, the CNSC's membership and participation in international activities also ensure that the CNSC's regulatory activities are consistent, as appropriate, with internationally agreed upon best practices and principles. In 2019–20, the CNSC hosted an Integrated Regulatory Review Service (IRRS)[5] mission, which offers a unique opportunity for other regulators and the IAEA to assess the CNSC's regulatory framework against international standards and best practices. The CNSC was also the first G7 country to participate in an Emergency Preparedness Review (EPREV)[6] mission, which evaluates the country's level of preparedness for nuclear or radiological emergencies. Over the next few years, the CNSC will implement the action plans that were developed based on recommendations, suggestions and good practices stemming from both of these peer review missions.

Figure 2: All CNSC counterparts, IAEA counterparts and team leads who participated in the IRRS mission.

One of the many resources the CNSC uses to achieve the departmental results related to the protection of the environment and Canadians is its laboratory. The CNSC Laboratory supports the organization by providing sample analysis and radiation instrument calibration services. It provides advanced radiation instrument training and expert services in the fields of radiochemistry, chemistry, radiation physics and nuclear forensics. It also plays an important role in the CNSC's Independent Environmental Monitoring Program[7], which verifies that the public and the environment around CNSC-regulated nuclear facilities are not adversely affected by releases to the environment.

Canada's science vision

The Government of Canada supports science and research. In the proposed measures of Budget 2019, the government continues to support science and research and the people who power it, having committed more than $10 billion to this sector since 2016. This includes the single largest investment in fundamental research in Canadian history. To deliver cutting-edge, world-class science, Canada's federal researchers and scientists need to work in an environment that encourages collaboration and be supported by state-of-the-art equipment and infrastructure. That is why, in addition to the new funding, $2.8 billion has been allocated to renew federal laboratories and to provide needed infrastructure.

Activities in the initial phase of this initiative will be grouped into clusters based on science program synergies to enable shared research agendas and infrastructure to solve challenges related to sustainable land and resource development, a low-carbon economy, and the safety and health of Canadians. The CNSC will leverage this opportunity to expand on its collaboration with its federal partners in the areas of health research and radioactivity in the environment to ensure the health and safety and people and the environment.

Departmental Result 3:
Nuclear material and substances, facilities and activities are secure and used for peaceful purposes.

Through the *Nuclear Safety and Control Act* (NSCA), the CNSC implements Canada's international commitments on the peaceful use of nuclear energy. The CNSC implements regulatory programs to ensure that CNSC licensees and Canada at large meet the obligations arising from Canada's international safeguards agreements with the IAEA. Safeguards conclusions drawn by the IAEA assure Canadians and the international community that all nuclear materials in Canada are used for peaceful purposes. In 2020–21, the CNSC will focus on working with the IAEA and licensees to develop safeguard approaches for new nuclear activities such as SMRs, decommissioning projects and isotope production, while updating safeguards measures for existing facilities under the IAEA's revised State-Level Approach.

The exports of major nuclear items are made subject to nuclear cooperation agreements (NCAs)[8]. These are treaty-level agreements designed to minimize the proliferation risk associated with international transfers of significant nuclear items. The CNSC implements the terms and conditions of NCAs through administrative arrangements[9] that it concludes with its counterparts in partner countries. The CNSC also implements a licensing and compliance program to ensure that imports and exports of nuclear substances, prescribed equipment and prescribed information (technology) meet regulatory requirements, as well as Canada's nuclear non-proliferation[10] policy and international obligations and commitments. In 2020–21, the CNSC will have the

opportunity to support these broader Canadian non-proliferation efforts at the 2020 Review Conference for the *Treaty on the Non-Proliferation of Nuclear Weapons*[11].

Nuclear security is a major consideration in all CNSC activities. The CNSC is responsible for enforcing Canada's *Nuclear Security Regulations*[12] and works closely with nuclear operators, law enforcement and intelligence agencies, international organizations and other government departments to ensure that nuclear materials and facilities are adequately protected. Licensees adhere to stringent nuclear security requirements set forth by the CNSC and have programs in place to prevent the theft, loss or illicit use of nuclear substances. To mitigate this risk further, the CNSC works domestically and internationally to strengthen the capacity to prevent, detect and respond to nuclear terrorism, through support for efforts such as the Global Initiative to Combat Nuclear Terrorism[13].

Concerns exist over the non-malevolent loss or appropriation of nuclear substances as well. The CNSC regulates close to 1 million shipments of radioactive material in Canada every year. Several industrial and commercial applications involve the use of portable radiation devices. Medical isotopes are increasingly being imported from overseas. As the use and transport of nuclear substances increases, so may the risk of their loss or appropriation, and the likelihood of transport events resulting in an incident or risks to public safety. To ensure safety, the CNSC requires licensees to have established procedures for the proper handling of such materials, and all shipments of risk-significant material are required to have a transport security plan as well as an emergency response assistance plan. To mitigate this risk further, the CNSC will continue to assist licensees through its comprehensive set of compliance promotion tools, including direct communications, safety bulletins, newsletters and outreach sessions.

Departmental Result 4:
Canadians, including Indigenous peoples, have meaningful information about, and the opportunity to participate in, the nuclear regulatory process.

The CNSC is a proactive regulator that supports public and Indigenous participation in the CNSC's regulatory processes. The CNSC's public hearings and meetings are open to the public, are sometimes held in the community and are always webcast live on the CNSC's website. In addition, the CNSC offers funding through its Participant Funding Program to help support the participation of eligible recipients in bringing valuable information to the Commission. This is recognized internationally as a best practice to emulate. The public and Indigenous peoples are also consulted on discussion papers and draft regulatory framework documents prior to publication. Furthermore, the CNSC frequently participates in community outreach and engagement activities, and responds to media calls and public information inquiries. As an agent of the Crown, the CNSC has an important responsibility to engage and consult with interested Indigenous groups and is committed to developing long-term positive relationships with these communities. The CNSC is always striving to implement ideas to improve its outreach and

engagement strategies. In 2020–21, the CNSC will begin implementing improved engagement mechanisms, including hosting forums with civil society organizations and Indigenous communities, as well as a licensee/CEO forum.

In just the past few years, immense progress has been made by both the CNSC and licensees to make documents and reports readily available online to members of the public. Beginning in 2018, documents submitted for Commission proceedings became downloadable from the CNSC website[14]. In 2020–21, the CNSC will further increase the release of information that supports regulatory activities and decisions, and will make scientific reports, documents and data more accessible and easier to use through facility registries on the CNSC website, as well as on Government of Canada open science platforms.

Joint CNSC and Environment and Climate Change Canada / National Pollution Release Inventory Task Team
Under the joint CNSC and Environment and Climate Change Canada / National Pollution Release Inventory (NPRI) Task Team, efforts are ongoing to increase accessibility to core environmental protection documentation, with an emphasis on radionuclide releases to the environment. In 2019, query links between the CNSC and NPRI websites were established and "beta" tested by a multi-stakeholder working group consisting of representatives of non-governmental organizations, industry and Indigenous groups. In 2020–21 there will be further expansion of digital data sources for radionuclide release transfers and disposal, and improvements to the interoperability of the CNSC and NPRI datasets.

Also available on the CNSC's website[15] are some of the technical papers and presentations delivered by experts from the CNSC at conferences, seminars, technical meetings and workshops in Canada and around the world. CNSC staff also contribute to research projects under the CNSC Research and Support Program,[16] which includes research that continues to strengthen the CNSC's regulatory framework in preparation for post-refurbishment operation of nuclear power plants and research in radioactive waste safety.

Experimentation

The CNSC strives to be an agile modern organization able to adapt to an evolving environment and new technologies. To achieve this vision, the CNSC is assessing its processes and practices using lean assessment methods, and developing internal capacity to conduct those assessments. The CNSC recognizes that its employees and regulatory safety culture are the driving forces behind identifying and implementing continuous improvements. The CNSC will continue to invest in training its staff during the fiscal year to improve internal capacity for developing and implementing lean processes throughout the organization.

Regulatory safety culture at the CNSC

In 2020–21, the CNSC will hold a country-specific safety culture forum to help establish national traits that define and clarify safety culture as they are manifested from organizational behaviours. As well, the forum will identify best practices for improving organizational safety culture.

Planned results

Departmental Results	Departmental Result Indicators	Target	Date to achieve target	2018–19 Actual results	2017–18 Actual results	2016–17 Actual results
The environment is protected from releases from nuclear facilities and activities.	Number of instances of radiological releases that exceeded regulatory limits	0	March 31, 2021	0	1[17]	0
	Number of instances of hazardous releases that exceeded regulatory limits	0	March 31, 2021	9[18]	2[19]	1[20]
	Percentage of Independent Environmental Monitoring Program (IEMP) samples (food, water, air and vegetation) that met guidelines	100%	March 31, 2021	97%[21]	90%[20]	80%[20]
Canadians are protected from radiation resulting from nuclear facilities and activities.	Number of radiation doses to members of the public that exceeded regulatory limits	0	March 31, 2021	1[22]	0	1[23]
	Number of radiation doses to workers that exceeded regulatory limits	0	March 31, 2021	1[24]	1[25]	2[26]
Nuclear material and substances, facilities and activities are secure and used for peaceful purposes.	Number of instances of non-peaceful or malicious use of Canadian exports of nuclear substances, equipment and information	0	March 31, 2021	0	0	0
	Number of lost or stolen radioactive sealed sources	≤ 2	March 31, 2021	0	0	1[27]
	Canada's international commitments to the International Atomic Energy Agency (IAEA) with respect to nuclear safeguards and verification are met	Receipt of broader conclusion[28]	December 31, 2020	Met	Met	Met
Canadians, including Indigenous peoples, have meaningful information about, and the opportunity to participate in, the nuclear regulatory process.	Percentage of CNSC proceedings that were accessible to members of the public and Indigenous peoples	> 90%	March 31, 2021	100%	100%	100%
	Percentage of CNSC proceedings for which the Participant Funding Program (PFP) was made available to members of the public and Indigenous peoples	> 90%	March 31, 2021	100%	100%	100%
	Percentage of public proceedings documents that were available in a timely manner upon request by members of the public and Indigenous peoples	> 90%	March 31, 2021	100%	100%	100%
	Number of Indigenous peoples who participated in CNSC proceedings	Increasing trend	March 31, 2021	18[29]	20	8

Financial, human resources and performance information for the Canadian Nuclear Safety Commission's Program Inventory is available in the GC InfoBase[30].

Planned budgetary financial resources

2020–21 budgetary spending (as indicated in Main Estimates)	2020–21 planned spending	2021–22 planned spending	2022–23 planned spending
99,256,451	106,939,338	108,473,336	109,952,586

Financial, human resources and performance information for the Canadian Nuclear Safety Commission's Program Inventory is available in the GC InfoBase[30].

Planned human resources

2020–21 planned full-time equivalents	2021–22 planned full-time equivalents	2022–23 planned full-time equivalents
618	612	610

Financial, human resources and performance information for the Canadian Nuclear Safety Commission's Program Inventory is available in the GC InfoBase[30].

Planned results for Internal Services

Description

Internal Services are those groups of related activities and resources that the federal government considers to be services in support of Programs and/or required to meet corporate obligations of an organization. Internal Services refers to the activities and resources of the 10 distinct services that support Program delivery in the organization, regardless of the Internal Services delivery model in a department. These services are:

- Management and Oversight Services
- Communications Services
- Legal Services
- Human Resources Management Services
- Financial Management Services
- Information Management Services
- Information Technology Services
- Real Property Management Services
- Materiel Management Services
- Acquisition Management Services

Mental Health

Results of the most recent Public Service Employee Survey indicate that 88% of employees feel the CNSC is doing a good job of promoting and raising awareness of mental health and eliminating the associated stigma. To continue momentum the CNSC is developing a Mental Health Strategy that includes delivering training, holding mental health breaks, participating in the Not Myself Today[31] campaign and organizing the annual CNSC Health Fair.

Planning highlights

Diversity and inclusion are fundamental to the CNSC's regulatory safety culture and critical to spurring innovation and team collaboration. Over the years, the CNSC has taken deliberate actions to build a healthy, collaborative workplace and a supportive culture for employees. More effort is required to create an even safer and more open work environment – one that is inclusive, and free from harassment and discrimination – where all employees are comfortable proposing new ideas and raising issues without fear of reprisal. The CNSC's Diversity and Inclusion Plan 2019–2022 outlines ongoing and new commitments to leverage diversity and to make progress in creating a safe, inclusive workplace. Commitments include continuing to educate CNSC staff and management on why diversity and inclusion matters through the use of communication tools, internal learning sessions, and the promotion of the Canada School of Public Service offerings. In 2020-21 the CNSC will also undertake an Employment Systems Review to ensure there are no barriers to full employment participation of members of the Employment Equity Designated Groups.

Planned budgetary financial resources for Internal Services

2020–21 budgetary spending (as indicated in Main Estimates)	2020–21 planned spending	2021–22 planned spending	2022–23 planned spending
44,578,522	48,029,097	48,718,053	49,382,421

Planned human resources for Internal Services

2020–21 planned full-time equivalents	2021–22 planned full-time equivalents	2022–23 planned full-time equivalents
287	286	286

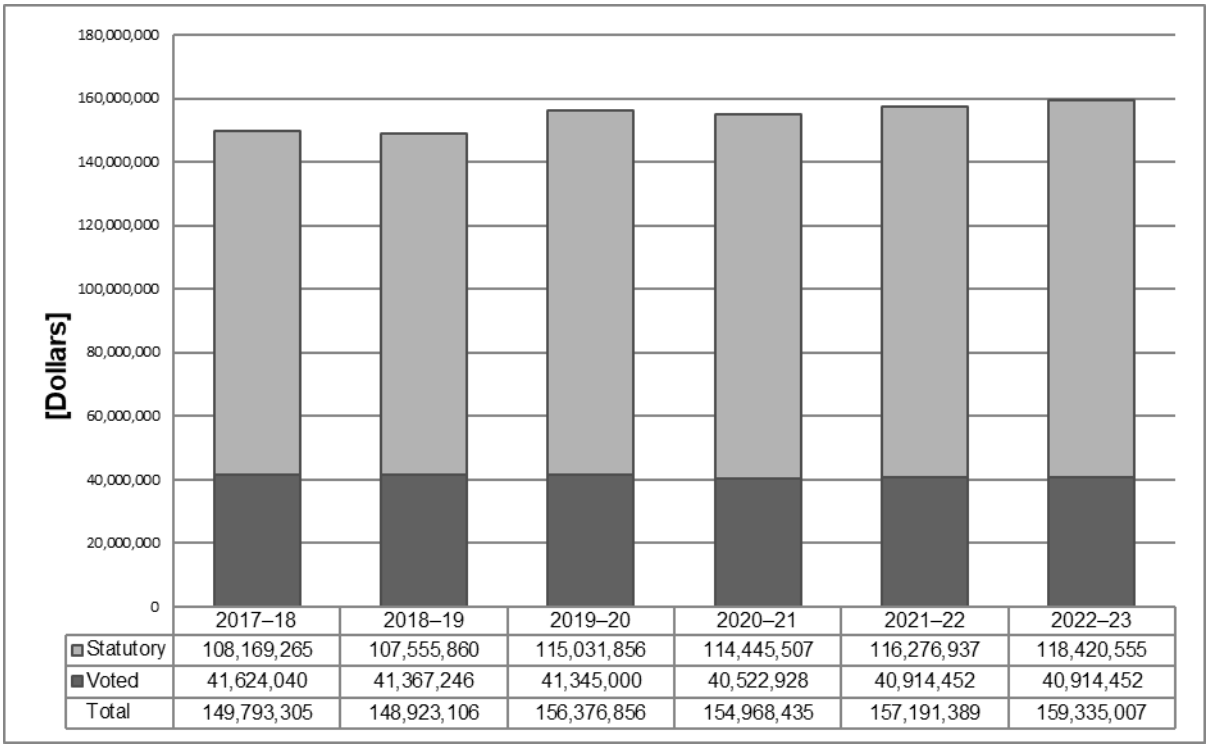
Spending and human resources

This section provides an overview of the department's planned spending and human resources for the next three consecutive fiscal years, and compares planned spending for the upcoming year with the current and previous years' actual spending.

Planned spending

Departmental spending 2017–18 to 2022–23

The following graph presents planned (voted and statutory) spending over time.



	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23
Statutory	108,169,265	107,555,860	115,031,856	114,445,507	116,276,937	118,420,555
Voted	41,624,040	41,367,246	41,345,000	40,522,928	40,914,452	40,914,452
Total	149,793,305	148,923,106	156,376,856	154,968,435	157,191,389	159,335,007

Overall, the CNSC's spending has been relatively stable, with increases largely reflecting the growth in wages resulting from negotiated salary adjustments, which in some years included retroactive salary payments such as in 2019-20.

Budgetary planning summary for Core Responsibility and Internal Services (dollars)

The following table shows actual, forecast and planned spending for each of the Canadian Nuclear Safety Commission's core responsibilities and to Internal Services for the years relevant to the current planning year.

Core responsibilities and Internal Services	2017–18 expenditures	2018–19 expenditures	2019–20 forecast spending	2020–21 budgetary spending (as indicated in Main Estimates)	2020–21 planned spending	2021–22 planned spending	2022–23 planned spending
Nuclear Regulation	102,683,841	100,067,374	107,911,250	99,256,451	106,939,338	108,473,336	109,952,586
Subtotal	102,683,841	100,067,374	107,911,250	99,256,451	106,939,338	108,473,336	109,952,586
Internal Services	47,109,464	48,855,732	48,465,606	44,578,522	48,029,097	48,718,053	49,382,421
Total	149,793,305	148,923,106	156,376,856	143,834,973	154,968,435	157,191,389	159,335,007

The marginal decrease in actual spending from $149.8 million in 2017–18 to $148.9 million in 2018–19 is due to reduced retroactive salary payments and professional services, offset in part by the cost of implementing the CNSC's new financial and material management system, completed in March 2019.

Planned spending is forecast to increase to $156.4 million in 2019–20 from actual spending of $148.9 million in 2018–19, primarily due to salary increases (including retroactive payments covering 2018–19) resulting from negotiated salary adjustments. The CNSC's planned spending is anticipated to decrease from $156.4 million in 2019–20 to $155.0 million in 2020–21, primarily as a result of retroactive salary payments made in 2019–20.

The CNSC's overall spending plans indicate no significant changes over the 2020–21 to 2022–23 planning periods. The increases in planned spending from $155.0 million in 2020–21 to $157.2 million in 2021–22 and $159.3 million in 2022–23 are primarily attributable to salary increases under the collective agreement.

The difference between the 2020–21 Main Estimates of $143.8 million and the 2020–21 planned spending of $155.0 million is due to the practice of including only the employee benefits costs associated with the voted appropriation funds in the Main Estimates, while including the additional employee benefits associated with the revenue spending authority in the planned spending. Fees collected by the CNSC represent approximately 70% of planned spending.

Planned human resources

The following table shows actual, forecast and planned full-time equivalents (FTEs) for each core responsibility in the Canadian Nuclear Safety Commission's departmental results framework and to Internal Services for the years relevant to the current planning year.

Human resources planning summary for core responsibilities and Internal Services

Core responsibilities and Internal Services	2017–18 actual full-time equivalents	2018–19 actual full-time equivalents	2019–20 forecast full-time equivalents	2020–21 planned full-time equivalents	2021–22 planned full-time equivalents	2022–23 planned full-time equivalents
Nuclear regulation	585	625	611	618	612	610
Subtotal	585	625	611	618	612	610
Internal Services	269	293	289	287	286	286
Total	854	918	900	905	898	896

The increase in FTEs from 854 FTEs in 2017–18 to 918 FTEs in 2018–19 was mainly due to the implementation of the workforce renewal initiatives, which focus on the recruitment and development of science and engineering new graduates to meet the organization's future needs for senior regulatory and technical officers. In addition, the CNSC amended the calculation of FTEs to include students and alumni personnel commencing in 2018–19.

The forecast decrease from 918 FTEs in 2018–19 to 900 FTEs in 2019–20 is primarily due to a reduction in FTEs for students and alumni personnel. The FTE forecast anticipates marginal changes from 900 FTEs in 2019–20 to 905 FTEs in 2020–21, 898 FTEs in 2021–22 and 896 FTEs in 2022–23.

Estimates by vote

Information on the Canadian Nuclear Safety Commission's organizational appropriations is available in the 2019–20 Main Estimates[32].

Condensed future-oriented statement of operations

The condensed future-oriented statement of operations provides an overview of the Canadian Nuclear Safety Commission's operations for 2019–20 to 2020–21.

The amounts for forecast and planned results in this statement of operations were prepared on an accrual basis. The amounts for forecast and planned spending presented in other sections of the Departmental Plan were prepared on an expenditure basis. Amounts may therefore differ.

A more detailed future-oriented statement of operations and associated notes, including a reconciliation of the net cost of operations to the requested authorities, are available on the Canadian Nuclear Safety Commission's website[33].

Condensed future-oriented statement of operations for the year ending March 31, 2021 (dollars)

Financial information	2019–20 forecast results	2020–21 planned results	Difference (2020–21 planned results minus 2019–20 forecast results)
Total expenses	171,912,000	173,997,000	2,085,000
Total revenues	121,914,000	125,267,000	3,353,000
Net cost of operations before government funding and transfers	49,998,000	48,730,000	(1,268,000)

The CNSC 2020-21 net cost of operations of $48.7 million reflects a decrease of $1.3 million (or 2.5%) when compared to the 2019-20 forecasted results. This change is a result of an increase in total revenues of $3.4 million (or 2.8%). The increase is comprised of a $2.2 million increase in special projects revenue due to an anticipated vendor design reviews for small modular reactors and a $1.2 million increase in regulatory fee revenues for adjustments to formula fees and recovery of salary increases. The total expenses are projected to increase by $2.1 million (or 1.2%) with cost increases for salaries and employee benefits and professional and special services, partially offset by a decrease in amortization as assets become fully depreciated.

Corporate information

Organizational profile

Appropriate minister: Seamus O'Regan

Institutional head: Rumina Velshi

Ministerial portfolio: Natural Resources Canada[34]

Enabling instrument: *Nuclear Safety and Control Act*[35]

Year of incorporation / commencement: 2000

Other: The CNSC's headquarters are located in Ottawa, Ontario. The CNSC maintains 11 regional offices, both at major facilities and elsewhere, in order to conduct inspections of licensees across the country on a regular basis.

Raison d'être, mandate and role: who we are and what we do

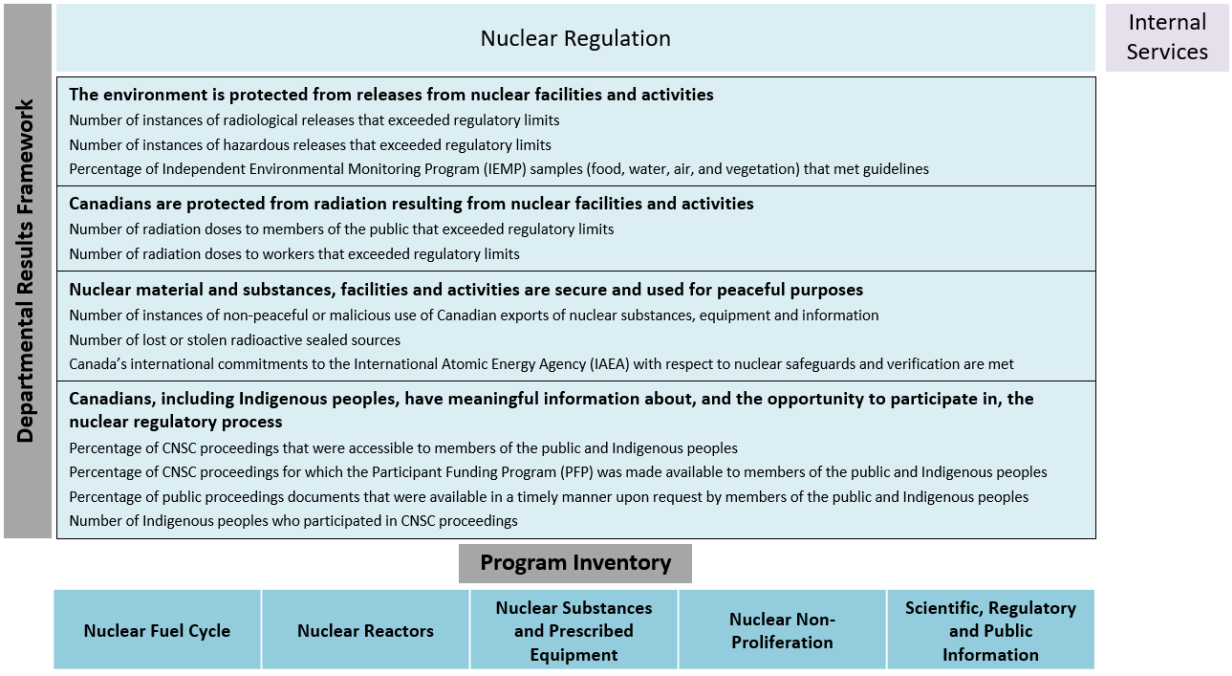
"Raison d'être, mandate and role: who we are and what we do" is available on the Canadian Nuclear Safety Commission's website[36] .

Operating context

Information on the operating context is available on the Canadian Nuclear Safety Commission's website[36].

Reporting framework

The Canadian Nuclear Safety Commission's departmental results framework and Program Inventory for 2020–21 are as follows.



Supporting information on the program inventory

Supporting information on planned expenditures, human resources, and results related to the Canadian Nuclear Safety Commission's program inventory is available in the GC InfoBase[30].

Supplementary information tables

The following supplementary information tables are available on the Canadian Nuclear Safety Commission's website[36]:

- Departmental Sustainable Development Strategy
- Details on transfer payment programs
- Gender-based analysis plus

Federal tax expenditures

The Canadian Nuclear Safety Commission's Departmental Plan does not include information on tax expenditures that relate to its planned results for 2020–21.

Tax expenditures are the responsibility of the Minister of Finance, and the Department of Finance Canada publishes cost estimates and projections for government-wide tax expenditures each year in the *Report on Federal Tax Expenditures*.[37] This report provides detailed information on tax expenditures, including objectives, historical background and references to related federal spending programs, as well as evaluations, research papers and gender-based analysis. The tax measures presented in this report are solely the responsibility of the Minister of Finance.

Organizational contact information

Mailing address

Head office
280 Slater Street
P.O. Box 1046, Station B
Ottawa, Ontario K1P 5S9
Canada

Telephone: 613-995-5894
Toll free: 1-800-668-5284
Fax: 613-995-5086

Email: cnsc.info.ccsn@canada.ca

Website(s): www.nuclearsafety.gc.ca[38]

Appendix: definitions

appropriation (crédit)

Any authority of Parliament to pay money out of the Consolidated Revenue Fund.

budgetary expenditures (dépenses budgétaires)

Operating and capital expenditures; transfer payments to other levels of government, organizations or individuals; and payments to Crown corporations.

core responsibility (responsabilité essentielle)

An enduring function or role performed by a department. The intentions of the department with respect to a core responsibility are reflected in one or more related departmental results that the department seeks to contribute to or influence.

Departmental Plan (plan ministériel)

A report on the plans and expected performance of a department over a 3-year period. Departmental Plans are tabled in Parliament each spring.

departmental priority (priorité ministérielle)

A plan or project that a department has chosen to focus and report on during the planning period. Departmental priorities represent the things that are most important or what must be done first to support the achievement of the desired departmental results.

departmental result (résultat ministériel)

A consequence or outcome that a department seeks to achieve. A departmental result is often outside departments' immediate control, but it should be influenced by program-level outcomes.

departmental result indicator (indicateur de résultat ministériel)

A factor or variable that provides a valid and reliable means to measure or describe progress on a departmental result.

departmental results framework (cadre ministériel des résultats)

A framework that consists of the department's core responsibilities, departmental results and departmental result indicators.

Departmental Results Report (rapport sur les résultats ministériels)

A report on a department's actual accomplishments against the plans, priorities and expected results set out in the corresponding Departmental Plan.

experimentation (expérimentation)
The conducting of activities that seek to first explore, then test and compare, the effects and impacts of policies and interventions in order to inform evidence-based decision-making, and improve outcomes for Canadians, by learning what works and what doesn't. Experimentation is related to, but distinct from innovation (the trying of new things), because it involves a rigorous comparison of results. For example, using a new website to communicate with Canadians can be an innovation; systematically testing the new website against existing outreach tools or an old website to see which one leads to more engagement, is experimentation.

full-time equivalent (équivalent temps plein)
A measure of the extent to which an employee represents a full person-year charge against a departmental budget. Full-time equivalents are calculated as a ratio of assigned hours of work to scheduled hours of work. Scheduled hours of work are set out in collective agreements.

gender-based analysis plus (GBA+) (analyse comparative entre les sexes plus [ACS+])
An analytical process used to assess how diverse groups of women, men and gender-diverse people experience policies, programs and services based on multiple factors including race, ethnicity, religion, age, and mental or physical disability.

government-wide priorities (priorités pangouvernementales)
For the purpose of the 2020–21 Departmental Plan, government-wide priorities refers to those high-level themes outlining the government's agenda in the 2015 Speech from the Throne, namely: Growth for the Middle Class; Open and Transparent Government; A Clean Environment and a Strong Economy; Diversity is Canada's Strength; and Security and Opportunity.

horizontal initiative (initiative horizontale)
An initiative in which two or more federal organizations are given funding to pursue a shared outcome, often linked to a government priority.

non-budgetary expenditures (dépenses non budgétaires)
Net outlays and receipts related to loans, investments and advances, which change the composition of the financial assets of the Government of Canada.

performance (rendement)
What an organization did with its resources to achieve its results, how well those results compare to what the organization intended to achieve, and how well lessons learned have been identified.

performance indicator (indicateur de rendement)
A qualitative or quantitative means of measuring an output or outcome, with the intention of gauging the performance of an organization, program, policy or initiative respecting expected results.

performance reporting (production de rapports sur le rendement)
The process of communicating evidence-based performance information. Performance reporting supports decision-making, accountability and transparency.

plan (plan)
The articulation of strategic choices, which provides information on how an organization intends to achieve its priorities and associated results. Generally a plan will explain the logic behind the strategies chosen and tend to focus on actions that lead up to the expected result.

planned spending (dépenses prévues)
For Departmental Plans and Departmental Results Reports, planned spending refers to those amounts presented in the Main Estimates.

A department is expected to be aware of the authorities that it has sought and received. The determination of planned spending is a departmental responsibility, and departments must be able to defend the expenditure and accrual numbers presented in their Departmental Plans and Departmental Results Reports.

program (programme)
Individual or groups of services, activities or combinations thereof that are managed together within the department and focus on a specific set of outputs, outcomes or service levels.

program inventory (répertoire des programmes)
Identifies all of the department's programs and describes how resources are organized to contribute to the department's core responsibilities and results.

result (résultat)
An external consequence attributed, in part, to an organization, policy, program or initiative. Results are not within the control of a single organization, policy, program or initiative; instead they are within the area of the organization's influence.

statutory expenditures (dépenses législatives)
Expenditures that Parliament has approved through legislation other than appropriation acts. The legislation sets out the purpose of the expenditures and the terms and conditions under which they may be made.

strategic outcome (résultat stratégique)
A long-term and enduring benefit to Canadians that is linked to the organization's mandate, vision and core functions.

target (cible)

A measurable performance or success level that an organization, program or initiative plans to achieve within a specified time period. Targets can be either quantitative or qualitative.

voted expenditures (dépenses votées)

Expenditures that Parliament approves annually through an Appropriation Act. The vote wording becomes the governing conditions under which these expenditures may be made.

Endnotes

1 International Atomic Energy Agency, *Convention on Nuclear Safety*, www.iaea.org/topics/nuclear-safety-conventions/convention-nuclear-safety

2 United Nation's 2030 Agenda for Sustainable Development https://sustainabledevelopment.un.org/post2015/transformingourworld

3 Canadian Nuclear Safety Commission, Acts and Regulations, www.nuclearsafety.gc.ca/eng/acts-and-regulations/acts/index.cfm

4 CNSC's Regulatory Framework Plan http://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-framework/regulatory-framework-plan.cfm

5 International Atomic Energy Agency, Integrated Regulatory Review Service (IRRS), www.iaea.org/services/review-missions/integrated-regulatory-review-service-irrs

6 International Atomic Energy Agency, Emergency Preparedness Review (EPREV) Service, www.iaea.org/services/review-missions/emergency-preparedness-review-eprev-service

7 Canadian Nuclear Safety Commission, Independent Environmental Monitoring Program (IEMP), www.nuclearsafety.gc.ca/eng/resources/maps-of-nuclear-facilities/iemp/index-iemp.cfm

8 Canadian Nuclear Safety Commission, International agreements, www.nuclearsafety.gc.ca/eng/resources/international-cooperation/international-agreements.cfm

9 Canadian Nuclear Safety Commission, International agreements, http://nuclearsafety.gc.ca/eng/resources/international-cooperation/international-agreements.cfm

10 Canadian Nuclear Safety Commission, Non-proliferation: import/export controls and safeguards, www.nuclearsafety.gc.ca/eng/resources/non-proliferation/index.cfm

9 United Nations Office for Disarmament Affairs, 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, https://www.un.org/disarmament/wmd/nuclear/npt-review-conferences/

12 Justice Laws Website, *Nuclear Security Regulations*, www.laws-lois.justice.gc.ca/eng/regulations/sor-2000-209/

13 Global Initiative to Combat Nuclear Terrorism, www.gicnt.org/

14 Canadian Nuclear Safety Commission, Public Commission hearings, www.nuclearsafety.gc.ca/eng/the-commission/hearings/documents_browse/index.cfm

15 Canadian Nuclear Safety Commission, Technical papers, presentations and articles – 2019, www.nuclearsafety.gc.ca/eng/resources/research/technical-papers-and-articles/index.cfm

16 Canadian Nuclear Safety Commission, Research and Support Program, www.nuclearsafety.gc.ca/eng/resources/research/research-and-support-program/index.cfm

17 The reported exceedance was in relation to the monthly average discharge limit for radium-226 at the Elliot Lake decommissioned uranium mine site for the month of January 2018. Follow-up monitoring in the environment confirmed that there were no radiological impacts to the public or the environment.

18 In 2018–19, there were nine total exceedances of provincial hazardous substances limits, all at nuclear power plants. At the Pickering NGS, there were four exceedances of provincial hazardous substances limits. One exceedance was for morpholine concentration, two were for oil and grease, and one was an effluent temperature exceedance. At the Darlington NGS, one morpholine result was slightly above provincial hazardous substances limits. At the Bruce NGS, there were two toxicity exceedances and two ammonia exceedances of the provincial hazardous substances limits. The number of exceedances are related to minor sporadic issues at the nuclear power plants and vary from year to year. For all instances, CNSC staff reviewed the event and concluded that the licensee took appropriate corrective actions. The exceedances were discussed in Commission member document (CMD) 19-M30 on November 6 and 7, 2019. The provincial hazardous substances regulatory limit exceedances have always been reported in the CNSC's regulatory oversight reports. However, in previous years, the CNSC had not reported this information at the departmental level, as it was considered duplicative to any provincial reporting. In 2018–19, the CNSC started to report these exceedances at the departmental level as well to improve transparency and dissemination of information. CNSC staff confirmed that members of the public in the vicinity of these nuclear power plants were protected and that there were no expected health impacts resulting from exceedances of provincial hazardous substances limits at these nuclear power plants.

19 In 2017–18, there were two exceedances, both at the Bruce NGS. There was an exceedance of the ammonia provincial discharge limit and the acute toxicity limit. CNSC staff reviewed the event and concluded that the licensee took appropriate corrective actions. The exceedances were reported to the Commission in

CMD 18-M39 on November 8, 2018. CNSC staff confirmed that members of the public in the vicinity of the Bruce NGS were protected and that there were no expected health impacts resulting from exceedances of provincial hazardous substances limits at the Bruce NGS.

20 In 2016–17, there was one exceedance at the Pickering NGS where a morpholine release was slightly above provincial regulatory limits. CNSC staff reviewed the event and concluded that the licensee took appropriate corrective actions. The exceedance was reported to the Commission in CMD 17-M15 on August 16, 2018. CNSC staff confirmed that members of the public in the vicinity of the Pickering NGS were protected and that there were no expected health impacts resulting from exceedances of provincial hazardous substances limits at the Pickering NGS.

21 Some sites are known to be contaminated; therefore, if sampling occurs near a contaminated site during a fiscal year, the percentage of samples that meet guidelines will trend downwards that year. Noted exceedances for all three fiscal years were expected, as they are similar to values reported by CNSC licensees' environmental monitoring programs. No additional unexpected exceedances were noted. In 2018–19, there were four exceedances at Elliott Lake historical sites for two sediment results and two water results. These exceedances are related to iron, lead and zinc in sediment and water. These heavy metals are contaminants from historical industrial activities at the Elliott Lake site. There were also 27 exceedances at the Deloro Mine site for 15 sediment results and 12 water results. Exceeding a guideline does not mean that there is an expected health impact; rather, it triggers a more in-depth assessment by CNSC staff to ensure that the health and safety of people and the environment are protected. In all noted cases, CNSC staff have concluded that the public and environment are protected from ongoing releases from nuclear facilities and activities. More information in IEMP results for each site is available on the CNSC website.

22 During the period of March 1, 2017 to February 28, 2018, a member of the public received a cumulative dose of approximately 1.06 mSv. This dose is above the annual regulatory effective dose limit of 1 mSv for members of the public, but would not result in any effect on the health and safety of the person. This person was a non-nuclear energy worker responsible for transporting packages, the majority of which contain nuclear substances. CNSC staff reviewed an investigation report submitted by the licensee and are satisfied with the actions taken to prevent a recurrence. The incident was reported to the Commission in Commission member document (CMD 18-M43 on August 22, 2018.

23 On September 24, 2016, a member of the public received a dose of approximately 1.62 mSv, which is above the annual regulatory effective dose limit of 1 mSv for members of the public, but would not result in any effect on the health and safety of the person. The member of the public was a passenger in a vehicle operated by a driver that was under contract with a carrier company, transporting packages that contained nuclear substances. This practice is not authorized under the *Packaging and Transport of Nuclear Substances Regulations, 2015* and involved a number of instances of non-compliance with the aforementioned regulations, as well as the *Transportation of Dangerous Goods Regulations*. The incident was reported to the Commission in CMD 16-M69 on December 14, 2016.

24 In November 2018, a nuclear energy worker received an equivalent dose of approximately 1 680 mSv to the left hand, in excess of the annual regulatory equivalent dose limit of 500 mSv. No health effects have been observed since the incident and no physical effects due to the exposure are expected. The incident was reported to the Commission in CMD 18-M65 on December 13, 2018.

25 On October 28, 2016, a nuclear energy worker received a dose of approximately 1 100 mSv to the left hand when the worker experienced contamination during routine administration (injections) of a nuclear substance to patients. The dose was in excess of the annual regulatory equivalent dose limit of 500 mSv. No health effects have been observed since the incident and no physical effects due to the exposure are expected. The incident was reported to the Commission in CMD 16-M72 on December 14, 2016. On March 1, 2017, a nuclear energy worker received a dose of approximately 2 300 mSv to the right hand when the worker experienced contamination during the administration of therapeutic doses of a nuclear substance to patients. The dose was in excess of the annual regulatory equivalent dose limit of 500 mSv. No health effects have been observed since the incident and no physical effects due to the exposure are expected. The incident was reported to the Commission in CMD 17-M22 on April 12, 2017.

26 In February 2018, a nuclear energy worker received a dose of approximately 3 600 mSv to the right wrist, in excess of the annual regulatory equivalent dose limit of 500 mSv. No health effects have been observed since the incident and no physical effects due to the exposure are expected. The incident was reported to the Commission in CMD 18-M18 on March 15, 2018.

27 A Category 2 (high-risk) exposure device was lost on August 3, 2016, and recovered on August 4, 2016. CNSC packaging requirements for this type of device are designed to withstand extreme drops, fire and direct

impacts. Therefore, the device was in safe condition to be transported back to a secure storage location for inspection. There was no impact to members of the public or the environment, and the CNSC was in constant contact with the licensee and local response authorities to ensure that appropriate follow-up actions were taken. The risk categorization of the sealed source at the time of the event – Category 1 (highest risk) to Category 5 (lowest risk) – is based on the IAEA document titled *Categorization of Radioactive Sources*. Only Categories 1 and 2 are included in this indicator. More information on lost and stolen sources is available on the CNSC's website.

28 The International Atomic Energy Agency (IAEA) concludes annually, on the basis of its verification efforts in a state, that all nuclear material remains in peaceful use and that there are no indications of diversion.

29 The decrease in Indigenous participation in 2018–19 relative to 2017–18 is due to fewer total public proceedings.

30 GC InfoBase, https://www.tbs-sct.gc.ca/ems-sgd/edb-bdd/index-eng.html#start

31 Not Myself Today, https://www.notmyselftoday.ca/

32 2018–19 Main Estimates, https://www.canada.ca/en/treasury-board-secretariat/services/planned-government-spending/government-expenditure-plan-main-estimates.html

33 Canadian Nuclear Safety Commission, Future-Oriented Statement of Operations, http://nuclearsafety.gc.ca/eng/resources/publications/reports/future-oriented-financial-statements/index.cfm

34 Natural Resources Canada, www.nrcan.gc.ca/home

35 Justice Laws Website, *Nuclear Safety and Control Act*, www.laws-lois.justice.gc.ca/eng/acts/N-28.3/

36 Canadian Nuclear Safety Commission, Departmental Plans, www.nuclearsafety.gc.ca/eng/resources/publications/reports/rpp/index.cfm

37 Report on Federal Tax Expenditures, http://www.fin.gc.ca/purl/taxexp-eng.asp

38 Canadian Nuclear Safety Commission, www.nuclearsafety.gc.ca/