



# Information Dissemination

# **Licensing Process for Class I Nuclear Facilities and Uranium Mines and Mills**

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## **Licensing Process for Class I Nuclear Facilities and Uranium Mines and Mills**

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This document can be viewed on the CNSC at website [nuclearsafety.gc.ca](https://nuclearsafety.gc.ca). To request a copy of the document in English or French, please contact:

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## Preface

This regulatory document is part of the CNSC's Processes and Practices series of regulatory documents. The full list of regulatory document series is included at the end of this document and can also be found on the [CNSC's website](#).

The Canadian Nuclear Safety Commission regulates the use of nuclear energy and materials to protect health, safety, security and the environment; 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. Before any person or company can prepare a site for, construct, operate, decommission or abandon a nuclear facility; or possess, use, transport or store nuclear substances, it must obtain a licence issued by the CNSC.

This document provides an overview of the licensing process for Class I nuclear facilities and uranium mines and mills in Canada, taking into consideration the requirements of the *Nuclear Safety and Control Act* (NSCA) and associated regulations.

REGDOC 3.5.1 supersedes INFO-0756, *Licensing Process for New Nuclear Power Plants in Canada* (May 2008) and INFO-0759 Revision 1, *Licensing Process for New Uranium Mines and Mills in Canada* (August 2010).

Version 2.1 includes administrative updates to references to the Secretariat. As of January 1, 2022, the Commission Secretariat was renamed the Commission Registry and the Commission Secretary became the Commission Registrar.

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## Licensing Process for Class I Nuclear Facilities and Uranium Mines and Mills

### 1. Introduction

#### 1.1 Purpose

This document provides an overview of the licensing process for Class I nuclear facilities and uranium mines and mills in Canada, taking into consideration the requirements of the *Nuclear Safety and Control Act* (NSCA) and associated regulations.

#### 1.2 Scope

This document is applicable to Class I nuclear facilities and uranium mines and mills and provides information on the licensing process for all stages of licensing, from initial application to abandonment. This document does not describe the process for other licensing activities such as amendments or renewals.

### 2. The Canadian Nuclear Safety Commission's role

Those wishing to carry out activities related to the site preparation, construction, operation, decommissioning and abandonment of nuclear facilities and uranium mines and mills in Canada must first obtain a licence from the CNSC. These activities are regulated under the [Nuclear Safety and Control Act](#) (NSCA) which establishes the CNSC's authority to set regulatory requirements for all nuclear-related activities in Canada.

The Commission is the CNSC's decision-making body and makes licensing decisions for all major nuclear facilities. As an independent administrative tribunal, it makes its decisions based on public input as well as CNSC staff's recommendations. The Commission makes its decisions transparently, guided by the [Canadian Nuclear Safety Commission Rules of Procedure](#), which define how public hearings and opportunities to be heard are conducted and the [Canadian Nuclear Safety Commission By-laws](#), which define the management and conduct of commission meetings.

Staff perform technical assessments of licence application submissions against regulatory requirements, make recommendations to the Commission, and verify compliance with the NSCA, regulations, and any licence conditions imposed by the Commission.

#### 2.1 Nuclear regulatory framework

The CNSC's regulatory framework consists of laws passed by Parliament that govern the regulation of Canada's nuclear industry, and regulations, licenses and regulatory documents that the CNSC uses to regulate the industry.

The following regulations made under the NSCA list the information applicants must submit to the CNSC as part of their licence applications:

- [General Nuclear Safety and Control Regulations](#)
- [Radiation Protection Regulations](#)
- [Class I Nuclear Facilities Regulations](#)

- [Class II Nuclear Facilities and Prescribed Equipment Regulations](#)
- [Uranium Mines and Mills Regulations](#)
- [Nuclear Substances and Radiation Devices Regulations](#)
- [Packaging and Transport of Nuclear Substances Regulations](#)
- [Nuclear Security Regulations](#)
- [Nuclear Non-proliferation Import and Export Control Regulations](#)

A licence application must be accompanied by payment of the application fee as set by the [Canadian Nuclear Safety Commission Cost Recovery Fees Regulations](#).

Applicants must also be aware of, and comply with, other federal, provincial or territorial, and municipal legislation that may also apply to their projects. Some examples include:

- [Nuclear Terrorism Act](#)
- [Canadian Environmental Assessment Act, 2012](#) (CEAA 2012)
- [Canadian Environmental Protection Act](#)
- [Fisheries Act](#)
- [Navigable Waters Protection Act](#)
- [Transportation of Dangerous Goods Act](#)
- [Canada Labour Code](#)
- [Nuclear Energy Act](#)
- [Nuclear Fuel Waste Act](#)
- [Nuclear Liability and Compensation Act](#)
- [Radiation Emitting Devices Act](#)
- [Species at Risk Act](#)
- [Migratory Birds Convention Act, 1994](#)
- [Canada Water Act](#)

The CNSC issues regulatory documents that set out requirements and guidance that many applicants may use in preparing their licence applications. Regulatory documents form the basis for the assessment of licence applications. These documents are developed through a transparent consultative process with stakeholders, which include the general public, licensees, other government agencies, and non-governmental organizations.

National standards – particularly the consensus standards produced by the CSA Group – set out the necessary elements for acceptable design and performance at a regulated facility or for a regulated activity. Standards are one of the tools the CNSC uses to evaluate whether licensees are qualified to carry out licensed activities.

The CNSC's regulatory framework is also informed by international standards and best practices, including the guidance provided by the International Atomic Energy Agency's publications. Alignment with international standards and best practices allows the CNSC to build on the most recent advancements in safety in order to enhance Canadian requirements.

### **3. Involving Stakeholders in the Licensing Process**

The CNSC operates with a high level of transparency and is committed to engaging stakeholders through a variety of appropriate consultation processes, effective information sharing, participant

funding programs and communications. This commitment includes engaging potential applicants, affected parties, the public and Aboriginal groups in the early stages of nuclear projects and throughout the licensing process.

### **3.1 Pre-licensing communication with the CNSC, the public and Aboriginal groups**

It is recommended to contact the CNSC as soon as the applicant has enough information from preliminary activities to determine that a new nuclear project will proceed. Early communication can help the applicant develop a good understanding of:

- regulatory requirements
- environmental assessment process
- licensing process
- information that must be included in a licence application

Early communication enables the CNSC to plan for consultation with various interested parties including Aboriginal groups. Applicants are also encouraged to present the proposed project as early as possible to local communities and Aboriginal groups in order to address any potential interests and concerns. Early engagement in the planning and design stages of a proposed project can benefit all concerned by enhancing relationships, building trust, improving the understanding of the proposed project and its objectives.

### **3.2 Involving the public in the licensing process**

Public participation is encouraged in all licensing decisions. The consideration of licence applications for nuclear facilities by the Commission follows the public hearing process, as set out in the [Canadian Nuclear Safety Commission Rules of Procedure](#), which are available on the CNSC's website. One- or two-part public hearings for licensing applications typically take place over a 90-day period.

These proceedings allow affected parties and the public to learn about nuclear facilities and projects and to give an opportunity to be heard before the Commission. Aboriginal people and members of the public can participate in public hearings via written submissions and/or oral presentations. Commission hearings and meetings can also be viewed online as [webcasts](#), and transcripts of public hearings and meetings are also available to the public.

Throughout the lifecycle of a nuclear facility, licensees must provide information to the public and stakeholders on their safety record and their nuclear facilities and related activities. CNSC regulatory document [RD/GD-99.3, Public Information and Disclosure](#), [1] sets out regulatory requirements for licensees to proactively inform their public and stakeholders of their facilities' activities, as well as events or incidents that may occur. Its objective is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public.

### **3.3 Involving Aboriginal groups in the licensing process**

The CNSC's approach to involving Aboriginal groups includes commitments to uphold the honour of the Crown (federal, provincial and territorial governments), through relationship building and information sharing, as well as to meet the CNSC's legal obligations under section 35 of the *Constitution Act, 1982*. Since 2004, the Supreme Court of Canada has held that the Crown has a duty to consult and accommodate, where appropriate, when it contemplates conduct



that might adversely impact potential or established Aboriginal and/or treaty rights and related interests, including Aboriginal title.

The CNSC respects these commitments by informing Aboriginal groups of proposed projects, consulting with potentially impacted Aboriginal groups and encouraging participation throughout the licensing process. Aboriginal peoples are also encouraged to bring their concerns before the Commission. The CNSC also ensures that all recommendations or decisions pertaining to licensing decisions under the NSCA and environmental assessments under the CEAA 2012 consider Aboriginal groups' potential or established rights pursuant to the *Constitution Act, 1982*.

When developing and implementing consultation processes, the CNSC considers the guiding principles that have emerged from Canada's case law and best consultation practices as outlined in the document [Aboriginal Consultation and Accommodation – Updated Guidelines for Federal Officials to Fulfill the Duty to Consult – March 2011](#). Further details on the CNSC's approach to Aboriginal consultation can be found in [Codification of Practice: CNSC's Commitment to Aboriginal Consultation](#) and [Supplementary Information for Licensees: Aboriginal Consultation](#). CNSC regulatory document REGDOC-3.2.2, *Aboriginal Engagement*, is currently under development. See the CNSC's website for more information.

### **3.4 Participant funding program**

The CNSC administers a participant funding program to give the public, Aboriginal groups and other stakeholders the opportunity to request funding to participate in matters related to licensing for major nuclear facilities. The CNSC determines whether to offer participant funding as well as the maximum amount available for each offering. The objectives of the participant funding program are:

- to enhance Aboriginal, public and stakeholder participation in the licensing process
- to help stakeholders bring valuable information to the Commission through informed and topic-specific interventions related to aspects of licensing

More information about the [participant funding program](#) is available on the CNSC's website.

## **4. Environmental Assessment**

Protecting the environment is part of the CNSC's mandate. The CNSC requires the environmental effects of all licensed activities to be evaluated and considered when licensing decisions are made. An environmental assessment (EA) is a review of information used to support the Commission's determination on whether the licensee will make adequate provisions for the protection of the environment and the health and safety of persons while carrying out a licensed activity. An EA is carried out at the beginning of a project and considers the entire lifecycle of a project.

An EA includes information prepared by CNSC staff and comments received from Aboriginal groups and the public. After reviewing the EA, the Commission determines whether a proposed project is not likely to result in significant adverse environmental effects, taking into consideration the implementation of mitigation measures. Licensing, compliance and verification activities ensure that the licensee has implemented the mitigation and follow-up measures.

The proposed project may also require an EA by another provincial or territorial jurisdiction. To the extent possible, these processes are harmonized to reduce duplication and provide regulatory efficiency.

CNSC regulatory document REGDOC-2.9.1, *Environmental Protection: Environmental Assessments*, is currently under development. See the CNSC's website for more information.

## 5. Overview of the Licensing Process

The CNSC initiates the licensing process once it receives an application from an applicant. The [Canadian Nuclear Safety Commission Rules of Procedure](#) require the application to be filed with the Commission Registrar, along with the prescribed fee, as set out in the [Canadian Nuclear Safety Commission Cost Recovery Fees Regulations](#).

For major resource projects such as new uranium mines or reactor facilities, Natural Resources Canada's Major Projects Management Office (MPMO) coordinates the work of all the federal departments and agencies that have a role in the regulatory review of the project. The MPMO has published the *Guide to Preparing a Project Description for a Major Resource Project* to assist applicants, and more information is available on the [MPMO website](#).

The licence application contains, at a minimum, the identity of the applicant, a project description and a proposed schedule for completing the licensing process. Applicants are also encouraged to submit a schedule of submissions of all required information.

Section 3 of the [General Nuclear Safety and Control Regulations](#) identifies information that must be included in all licence applications. Some examples are:

- management structure
- radiation protection
- security
- waste management

Application requirements for specific licence types are listed in the [Class I Nuclear Facilities Regulations](#) and [Uranium Mines and Mills Regulations](#). For more information, see sections 6 and 7 of this document.

CNSC staff conduct technical assessments of the information submitted by an applicant to determine if it meets the regulatory requirements of the NSCA and regulations, CNSC requirements and expectations, international and domestic standards, and applicable international obligations. The CNSC's assessment includes input from other federal and provincial government departments, including those responsible for regulating health and safety, environmental protection, emergency preparedness, and the transportation of dangerous goods.

Once the assessment of an applicant's information is complete, CNSC staff will make recommendations on the licence application to the Commission. A licensing hearing is held to take into account the views, concerns and opinions of interested parties and intervenors. These hearings are open to the public and webcast live. The Commission considers the entirety of an application and all information received in the course of the matter before making a decision. Each decision to license is based on information that demonstrates that the activity or the operation of a given facility can be carried out safely and that the environment is protected.

Following the hearing, the Commission members will deliberate and issue a decision, including reasons for the decision. Typically, the decision and reasons for the decision are published within six weeks after the close of the hearing. See Appendix A for the licensing process map for Class I nuclear facilities and uranium mines and mills.

The timelines for regulatory reviews of licence applications are provided in section 8 of this document. The following may influence the duration of the licensing process:

- the EA process, depending on the jurisdictions involved and the amount of time required by the applicant to prepare the necessary documentation
- whether the information provided with the application is comprehensive and complete so the review of the application can be carried out in an efficient and timely manner
- the time required for the applicant to complete its activities at each licensing stage (prepare the site, construct and commission the nuclear facility and train and certify facility personnel)
- outstanding safety issues at each licensing stage, which will require resolution before CNSC staff can prepare their recommendations to the Commission for the next stage

Once a licence is issued, the CNSC carries out compliance activities to verify that the licensee is complying with the NSCA, associated regulations and its licence.

## 6. Licensing Process for Class I Nuclear Facilities

Class I nuclear facilities include nuclear reactors, including nuclear power plants and research reactors, high-energy accelerator facilities, as well as facilities that handle, process or store large quantities of nuclear substances. The CNSC's licensing process for Class I nuclear facilities follows the stages laid out in the [Class I Nuclear Facilities Regulations](#), proceeding progressively through each stage of their lifecycle. The regulations list the required information to support an application to conduct the following activities:

- prepare site
- construct
- operate
- decommission
- abandon

If the necessary applications are filed with the required information, the Commission may, at its discretion, issue a licence that includes multiple classes of licences (e.g., a licence to prepare site and construct, or a licence to construct and operate). A single licence may also be issued for multiple facilities, each at a different stage in their lifecycle.

See Appendix C, Regulatory Process for the Transition of a Reactor Facility from Operation to Decommissioning End State, for additional guidance on the regulatory lifecycle of a reactor facility.

### 6.1 Application to prepare site for a Class I facility

The objective of the site preparation stage is to assess whether the site is suitable for the construction and operation of a nuclear facility. An application for a licence to prepare site (LTPS) does not require detailed design information or specifications of a facility design but must provide enough information to demonstrate that releases of radioactive and hazardous substances are within limits claimed in the EA, and meet all applicable regulatory requirements.

The specific information required for an application for a LTPS for a Class I nuclear facility is listed in sections 3 and 4 of the *Class I Nuclear Facilities Regulations*. Examples of information submitted in support of an application to prepare a site are:

- the characteristics of the site and its environment, which could influence the transfer (to persons and the environment) of radioactive and hazardous material that may be released
- the potential effects of external events (such as seismic events, tornadoes and floods) and human activity on the site
- the population density, population distribution and other characteristics of the region, insofar as they may affect the implementation of emergency measures and the evaluation of the risks to individuals, the surrounding population and the environment
- public information program to keep the public and Aboriginal groups informed of the anticipated effects of the facility's site preparation activities on their health and safety and on the environment
- preliminary decommissioning plan
- proposed financial guarantee for the activities to be licensed under the licence to prepare site
- the proposed protective zone for the purposes of land use planning by the surrounding municipalities (reactor facilities)

The review of the application focuses on determining whether the site characteristics that have an impact on health, safety, security and the environment have been identified, and that these characteristics have been taken into consideration and will also be considered in the design, operation and decommissioning of the proposed facility. The technical information arising from the consideration of external events, site-specific characteristics and supporting assessments is used as input into the design of the facility for the chosen site, which is submitted in the construction licence application.

Before issuing an LTPS the Commission must be satisfied that the site preparation activities will be carried out in a manner that will satisfy all health, safety, security and environmental protection requirements.

The CNSC is developing requirements and guidance for this stage of licensing. See the website for more information.

## **6.2 Application to construct a Class I facility**

A licence to construct enables a licensee to construct, commission and operate some components of the facility (e.g., security systems). Some commissioning activities may be allowed in order to demonstrate the facility has been constructed in accordance with the approved design and that the structures, systems and components (SSCs) important to safety are functioning as intended.

An application for a licence to construct contains more detailed information about the design of the facility and the supporting safety case. The applicant must demonstrate that the proposed design of the facility conforms to regulatory requirements and will provide for the safe operation on the designated site over the proposed life of the facility.

The applicant is expected to address all follow-up activities identified during the EA, including those relevant to the design, construction and commissioning stages and verify that any outstanding issues from the site preparation stage have been resolved.

The specific information required for an application for a licence to construct a Class I nuclear facility is listed in sections 3 and 5 of the *Class I Nuclear Facilities Regulations*. Examples of information submitted in support of an application to construct are:

- a description of the proposed design of the facility, taking into consideration the physical and environmental characteristics of the site
- environmental baseline data about the site and surrounding area
- a preliminary safety analysis report, showing the adequacy of the design
- description of measures to mitigate the effects on the environment and health and safety of persons that may arise from the construction, operation or decommissioning of the facility
- information on the potential releases of nuclear substances and hazardous materials, and proposed measures to control them
- programs and schedules for recruiting and training for workers who conduct licensed activities
- public information and disclosure program to keep the public and target audiences informed of the anticipated effects of the facility's construction activities on their health and safety and on the environment
- updated preliminary decommissioning plan
- proposed financial guarantee for the activities to be licensed under the licence to construct

The review of the application focuses on determining whether the proposed design, the safety analysis and other required information meet regulatory requirements. The evaluation involves rigorous engineering and scientific analysis, taking into consideration national and international standards and best practices in nuclear facility design and operation. The CNSC also verifies that any outstanding issues from the site preparation stage have been resolved. The protective zone set at the time of the LTPS is also confirmed during review of the licence to construct.

For the latter part of construction, regulatory attention focuses on the commissioning program and associated activities, to demonstrate to the extent practicable that all the SSCs have been built and function as intended.

See CNSC regulatory document RD/GD-369, *Licence Application Guide: Licence to Construct a Nuclear Power Plant* [2] for guidance on the information to be submitted for a licence to construct. The CNSC is developing other requirements and guidance for this stage of licensing. See the website for more information.

### **6.3 Application to operate a Class I facility**

A licence to operate will enable a licensee to complete final commissioning activities and to operate the facility. Commissioning activities provide assurance that the facility has been properly designed and constructed and it is ready for safe operation.

The specific information required for an application for a licence to operate a Class I nuclear facility is in sections 3 and 6 of the *Class I Nuclear Facilities Regulations*. Examples of information submitted in support of an application to operate are:

- a description of the structures, systems and equipment of the facility, including their design and operating conditions
- the final safety analysis report
- the proposed measures, policies, methods and procedures for:
  - commissioning systems and equipment

- operating and maintaining the nuclear facility
- handling nuclear substances and hazardous materials
- controlling the release of nuclear substances and hazardous materials into the environment
- preventing and mitigating the effects on the environment and health and safety that result from the operation and subsequent decommissioning of the facility
- assisting offsite authorities in emergency preparedness activities, including assistance to deal with an accidental offsite release
- developing and maintaining nuclear security
- public information and disclosure program to keep the public and target audiences informed of the anticipated effects of the facility's operation on their health and safety and on the environment
- updated preliminary decommissioning plan
- proposed financial guarantee for the activities to be licensed under the licence to operate

The first licence to operate the facility is typically issued with conditions (hold points). All the relevant commissioning tests must be satisfactorily completed before the hold points can be removed.

The CNSC is developing requirements and guidance for this stage of licensing. See the website for more information.

#### **6.4 Application to decommission a Class I facility**

At the end of the useful life of a facility, the licensee may decide to apply for a licence to decommission. Throughout the life cycle of the facility the preliminary decommissioning plan has been reviewed and updated.

The specific information to be provided in support of an application for a licence to decommission a Class I nuclear facility is in sections 3 and 7 of the *Class I Nuclear Facilities Regulations*. Examples of information submitted in support of an application to decommission are:

- major components and systems within the facility which must be considered during decommissioning planning
- expected levels of radiation and contamination within the facility, following the end of operation
- assessment of structures, to ensure that they are capable of being maintained for the proposed period of storage and monitoring
- a public information and disclosure program to inform the public and target audiences of the anticipated effects of the decommissioning activities on the health and safety of the public and on the environment
- disposal plans for nuclear materials and radiation devices (prescribed nuclear materials)
- quantities, or volumes, of wastes of all types (radioactive and hazardous) expected during the decommissioning activities

The licensee's responsibility can be terminated once long-term monitoring has confirmed the successful completion of decommissioning. The Commission may issue a licence to abandon or an exemption from licensing, which will end the licensee's responsibility for the site and then transfer responsibility for regulatory oversight or institutional control from the CNSC to the

province or territory, if applicable. Information required to support the transfer agreement includes:

- results of decommissioning work
- results of environmental monitoring programs
- description of requirement for long-term institutional controls
- a program to inform the public of the effects of the transfer of responsibility on the health and safety of the public and on the environment

## 7. Licensing Process for Uranium Mines and Mills

The [\*Uranium Mines and Mills Regulations\*](#) (UMMR) list the required information to support an application to conduct the following activities:

- prepare site and construct
- operate
- decommission

If the necessary applications are filed with the required information, the Commission may, at its discretion, issue a licence that includes multiple classes of licences (e.g., one licence to prepare site, construct, operate and decommission). A single licence may also be issued for multiple facilities, each at a different stage in their lifecycle.

### 7.1 Application to prepare site and construct a mine or mill

During this stage a licensee may prepare the site, construct, commission and operate some components of the facility (e.g., a mine water treatment plant). Some commissioning activities may also be allowed in order to demonstrate the facility has been constructed in accordance with the approved design and that the SSCs important to safety are functioning as intended. All relevant commissioning tests must be satisfactorily completed and documented before an operating licence is issued.

The specific information required to obtain a licence to prepare site and construct is listed in sections 3, 4, and 5 of the UMMR. Examples of information submitted in support of an application to prepare the site and construct are:

- a description of the proposed design for the uranium mine or mill and its waste management system, taking into consideration physical and environmental characteristics of the site
- environmental baseline data on the site and surrounding area
- for mines, a description of the site geology, ground support structures, and ground water regime (local and regional)
- the anticipated quantities and grade of ore and waste rock that will be removed and their proposed storage and disposal locations
- a description of the proposed mining and milling methods and their associated programs
- results of the process-hazard analysis and the proposed quality assurance program for the design of the mine or mill
- a proposed commissioning plan for the components, systems and equipment to be installed in the mine or mill
- measures to mitigate the effects on the environment and health and safety of persons that may arise from the construction, operation or decommissioning of the facility

- information on the potential releases of nuclear substances and hazardous materials and proposed measures to control them
- a program and schedule for recruiting and training operations and maintenance staff
- a public information and disclosure program to inform the public and target audiences of the anticipated effects of the site preparation and construction of the facility on their health and safety and on the environment
- preliminary decommissioning plan
- proposed financial guarantee for the activities to be licensed under a licence to prepare site and construct

## **7.2 Application to operate a mine or mill**

At this stage, the licensee completes final commissioning and is then able to fully operate the facility including mining or milling the ore. The final commissioning activities will demonstrate that the facility has been constructed in accordance with the approved design and that the SSCs important to safety are functioning reliably and in accordance with design expectations.

The specific information required to obtain a licence to operate is listed in sections 3, 4, and 6 of the UMMR. Examples of information submitted in support of an application to operate are:

- a description of the structures, systems and equipment at the uranium mine or mill, including the design and operating conditions
- the results of any commissioning work
- preliminary decommissioning plan
- proposed financial guarantee for the activities to be licensed under a licence to operate
- proposed measures, policies, methods and procedures for:
  - commissioning systems and equipment
  - operating and maintaining the nuclear facility
  - handling nuclear substances and hazardous materials
  - controlling releases of nuclear substances and hazardous materials into the environment
  - waste management systems
  - preventing and mitigating the effects on the environment and health and safety resulting from operation of the facility
  - ground control measures for mines
  - assisting offsite authorities in emergency preparedness activities, including assisting dealing with an accidental offsite release
  - nuclear security
- a public information and disclosure program to inform the public and target audiences of the anticipated effects of the facility's operation on the health and safety of the public and on the environment

In addition to assessing the information included in the application, CNSC staff also verify that any outstanding issues from the site preparation and construction stage have been resolved.

## **7.3 Application to decommission a mine or mill**

The licence to decommission enables the licensee to decommission the mine or mill. The specific information required to obtain a licence to decommission is found in sections 3, 4, and 7 of the UMMR. Examples of information submitted in support of an application to decommission are:

- a proposed schedule for the decommissioning work



- land, buildings, structures, components, systems, equipment, nuclear substances and hazardous substances that will be affected by decommissioning
- the quantities or volumes of all other wastes (radioactive and hazardous) expected during the decommissioning activities
- measures, methods and programs for carrying out decommissioning
- description of the planned state of the site upon completion of the decommissioning work
- long-term management of some of the nuclear materials onsite (e.g., uranium tailings, special waste rock, residues and sludge, contaminated equipment that cannot be released from the site)
- a public information and disclosure program to inform the public and target audiences of the anticipated effects of the decommissioning activities on their health and safety and on the environment

The licensee's responsibility can be terminated once long-term monitoring has confirmed the successful completion of decommissioning. The Commission may issue a licence to abandon or an exemption from licensing which will end the licensee's responsibility for the site and then transfer responsibility for regulatory oversight or institutional control from the CNSC to the province or territory, if applicable. Information required to support the transfer agreement includes:

- results of decommissioning work
- results of environmental monitoring programs
- description of requirement for long-term institutional controls
- a program to inform the public of the effects of the transfer of responsibility on the health and safety of the public and on the environment

## **8. Timelines for Regulatory Reviews of Licence Applications**

A regulatory review is initiated once the Commission has determined that the applicant has submitted sufficient information to begin the review. A notice that the regulatory review has begun is then provided to the applicant and posted on the CNSC's website. An initial application may not include all the required information and the balance may be submitted based on a schedule determined by the applicant.

### **8.1 Regulated timelines for initial regulatory approvals**

The CNSC has established 24-month timelines in regulations for new nuclear facilities that require its regulatory review and a Commission decision on:

- a licence to prepare a site for a Class I nuclear facility
- a licence to prepare site for and construct a uranium mine and mill

Timelines for regulatory reviews apply to CNSC activities only and include the time needed to:

- ensure the initial licence application has sufficient information, including a comprehensive set of documentation submitted in support of the application
- complete a technical assessment of the application
- conduct a public hearing for the licensing decision related to the application
- publish the Commission's decision

Where the CNSC will need to carry out an environmental assessment in addition to its regulatory review, the timelines will accommodate the time needed to carry out the environmental assessment within the 24 month timeline.

The timelines do not include the time:

- that the CNSC waits for a response to a request for information that is required to complete the review
- to accommodate an applicant's request to extend the schedule for submitting required information
- to address matters outside the CNSC's control, such as the time for other jurisdictions to participate in and complete an environmental assessment

## 8.2 Expected regulatory review timelines for subsequent licensing stages

Regulatory review timelines provide more predictable timing of regulatory reviews of applications for licences for, while continuing to protect health, safety, security and the environment. The regulatory review process includes measures to allow Aboriginal groups, the public and interested parties to participate fully in the regulatory review of a licence application.

Timelines for the assessment of an application for a first licence for subsequent licensing stages are provided for illustrative purposes in the following sections. These timelines:

- assume that the CNSC will receive complete and comprehensive applications
- include the time needed for resolution of CNSC's comments on submissions
- assume the CNSC is solely responsible for completing the EA
- include the time required for the two-part licence hearing process, which is approximately four months and the Commission decision-making process which is up to 90 days

### 8.2.1 Class I nuclear facilities: Timelines for regulatory reviews of applications

Timelines for Class IA nuclear facilities:

Licensing stage	Timeline (months)
Licence to prepare site	24
Licence to construct	32
Licence to construct and operate	40
Licence to operate	24
Licence to decommission	24

See Appendix B.1 for a chart depicting licensing timelines for Class IA nuclear facilities (i.e., nuclear power plants and research reactors), from the initial application to a licence to operate.

See Appendix C, Regulatory Process for the Transition of a Reactor Facility from Operation to Decommissioning End State, for additional guidance on the regulatory lifecycle of a reactor facility.

Timelines for Class IB nuclear facilities:

<b>Licensing stage</b>	<b>Timeline (months)</b>
Licence to prepare site	24
Licence to construct	24
Licence to prepare site and construct	24
Licence to construct and operate	30
Licence to operate	20
Licence to decommission	24

See Appendix B.2 for a chart depicting licensing timelines for Class IB nuclear facilities (i.e., facilities that handle, process, or store large quantities of nuclear substances).

For major Class I nuclear facilities it is unlikely that the licensing process will involve a combined licence to prepare site and construct. The timelines are the same for a licence to construct and for a licence to prepare site and construct because the site preparation, characterization and evaluation are done in parallel with the review of the construction information.

### **8.2.2 Uranium mines and mills: Timelines for regulatory reviews of applications**

Timelines for uranium mines and mills:

<b>Licensing stage</b>	<b>Timeline (months)</b>
Licence to prepare site and construct	24
Licence to operate	20
Licence to decommission	24

See Appendix B.3 for licensing timelines for uranium mines and mills, from initial application to a licence to operate.

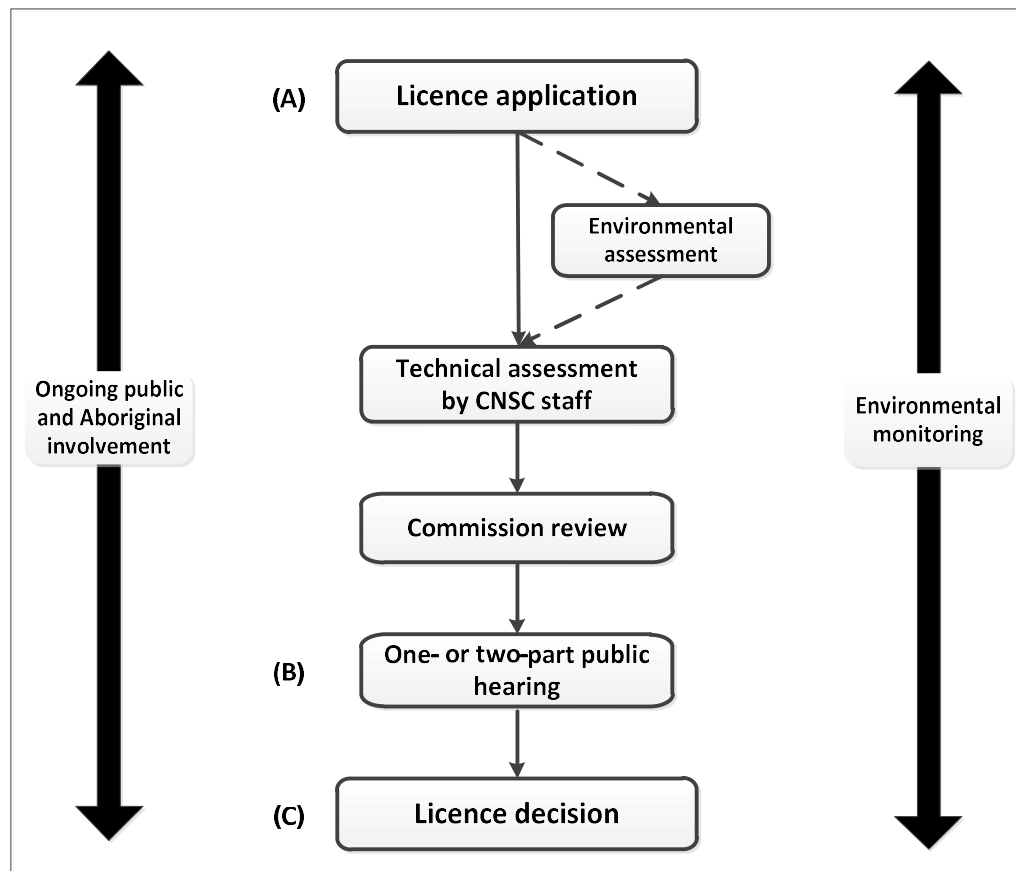
## Appendix A: Process for Obtaining a Licence for Class I Nuclear Facilities and Uranium Mines and Mills

Upon receipt of an application, the CNSC has the authority under section 24(2) of the *Nuclear Safety and Control Act* to decide whether to issue a licence.

Licensing hearings usually take place through a one- or two-part process. Public hearings give the applicant, CNSC staff, the public and Aboriginal groups an opportunity to be heard before the Commission. Most decisions involving major nuclear facilities are made through the two-part public hearing process, during which two hearings typically take place 60 days apart.

Figure 1 depicts the process for obtaining a licence for Class I nuclear facilities and uranium mines and mills.

**Figure 1. Licensing process for Class I nuclear facilities and uranium mines and mills**



### Notes:

Public and Aboriginal involvement and environmental monitoring are ongoing throughout the licensing process.

(A) The scope of the licence application determines the complexity of the review by CNSC staff and the Commission (see section 8 of this document for more information). If the environmental assessment

takes place at the same time as the regulatory review of the application, it will be presented to the Commission for decision at Part 1 of the hearing.

- (B) The applicant and CNSC staff present their submissions to the Commission at the public hearing, which is open to the public and broadcast on the CNSC's website. The public and Aboriginal groups are also encouraged to present their views on the application to the Commission.

Submissions that are filed with the CNSC for public hearings are called Commission Member Documents. For more details, see CNSC regulatory document G-379, *Guide for Applicants and Intervenors: Writing CNSC Commission Member Documents* [3].

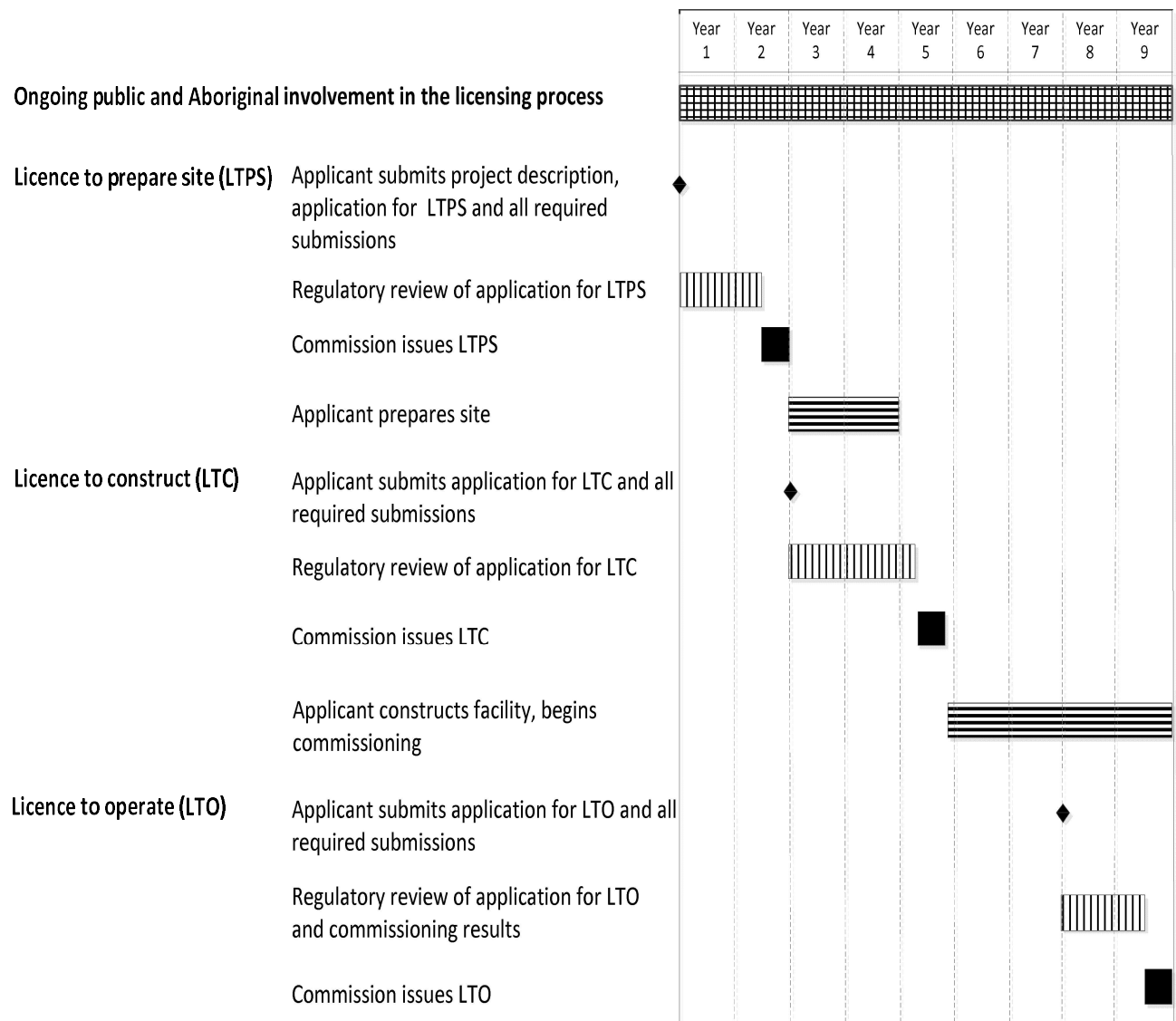
- (C) Following the hearing, the Commission deliberates and renders a decision. The CNSC issues the Commission's decision on the granting of the licence. The Commission's decision and its reasons for decision are usually published within six weeks of the conclusion of the hearing.

## Appendix B: Licensing timelines for Class I Nuclear Facilities and Uranium Mines and Mills

### B.1 Class IA nuclear facilities (reactor facilities)

Figure 2 depicts the licensing timeline from the initial application to a licence to operate for Class IA nuclear facilities.

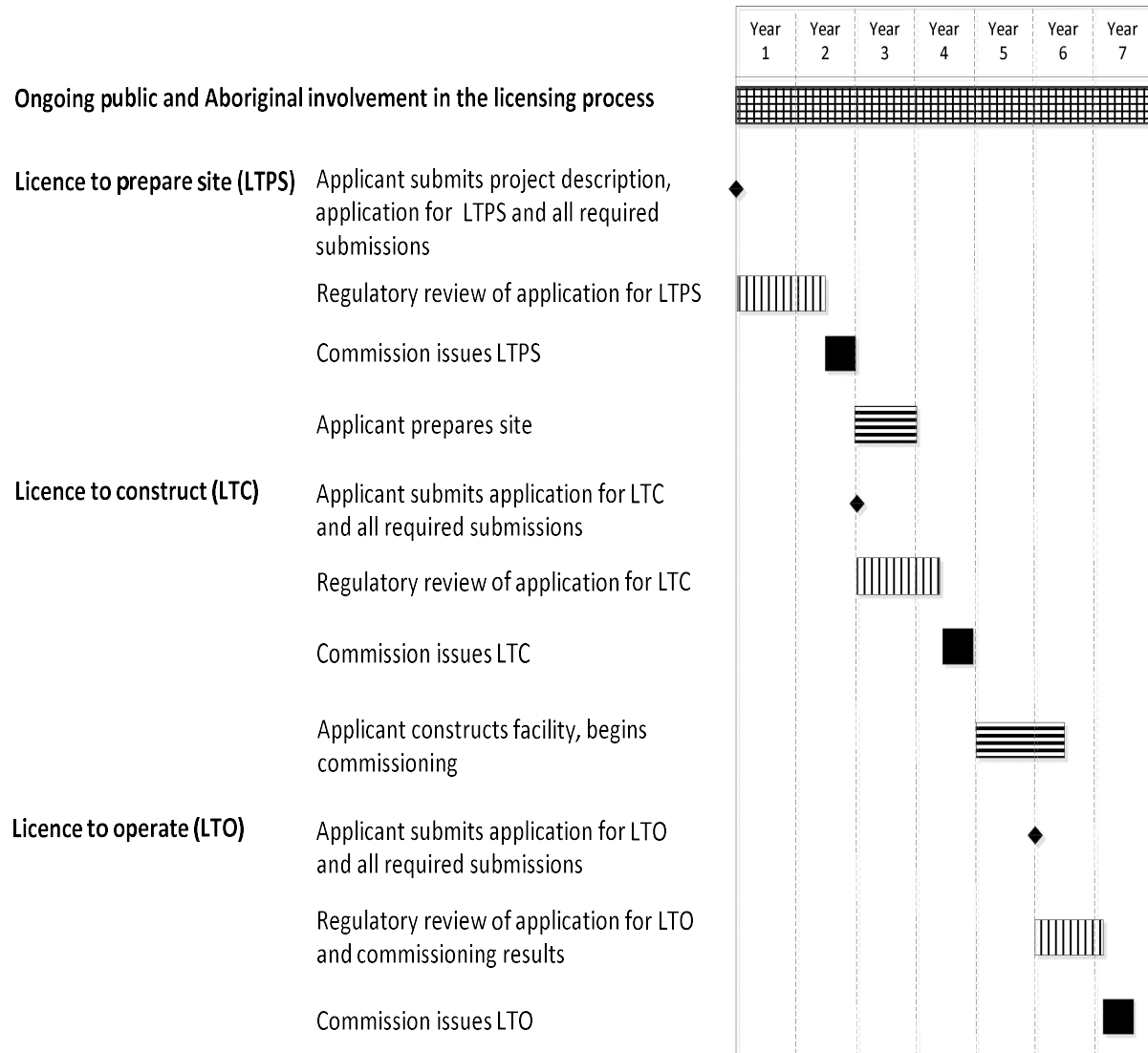
**Figure 2. Licensing timeline for Class IA nuclear facilities**



**B.2 Class IB nuclear facilities  
(high-power accelerators and facilities that handle, process or store large quantities of nuclear substances)**

Figure 3 depicts the timeline for licensing, from the initial application to a licence to operate for Class IB nuclear facilities.

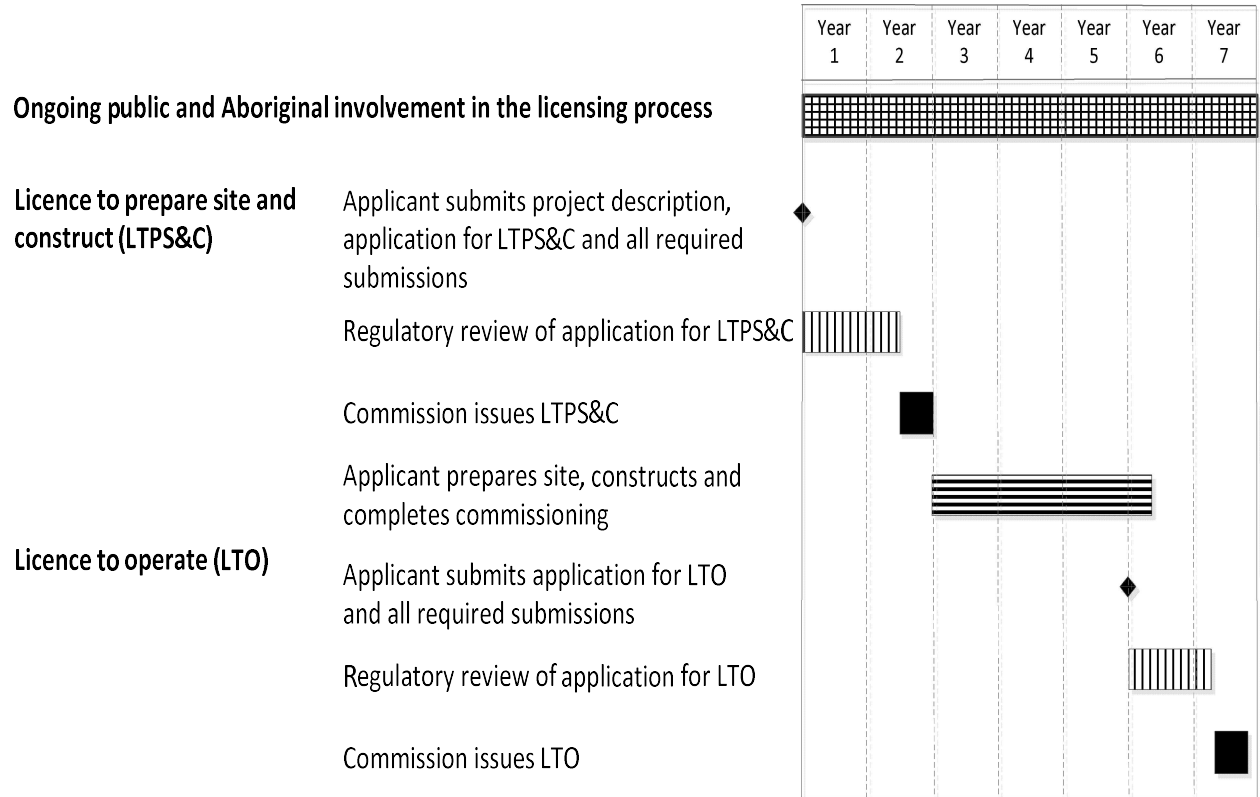
**Figure 3. Licensing timeline for Class IB nuclear facilities**



### B.3 Uranium mines and mills

Figure 4 depicts the timeline for licensing, from the initial application to a licence to operate for uranium mines and mills.

**Figure 4. Licensing timeline for uranium mines and mills**





## Appendix C: Regulatory Process for the Transition of a Reactor Facility from Operation to Decommissioning End State

This appendix outlines the regulatory process that is followed when a reactor facility (reactor) transitions from an operational state to a decommissioned state and is ready to be released from CNSC regulatory control.

### C.1 Lifecycle of a Reactor

There are five phases in a reactor's lifecycle:

1. siting
2. construction
3. operation
4. decommissioning
5. release from CNSC regulatory control

Following decommissioning, and with the assumption that disposal repositories are in place to accept low- and medium-level wastes as well as spent fuel, the site is released from CNSC regulatory control. Without disposal repositories in place, a portion of the site would be maintained as a nuclear waste management facility until final and offsite long-term management or permanent disposal solutions become available.

### C.2 Regulatory Requirements

At all phases except for the release from CNSC regulatory control, a decommissioning plan is required. The decommissioning plan is developed and updated progressively (typically every five years at a minimum) over the facility's lifecycle to reflect the appropriate level of detail required for the respective licensed activities.

For siting, construction and operation phases, the decommissioning plan (normally called a preliminary decommissioning plan or PDP) is required to outline the decommissioning strategy in sufficient detail to provide the basis for an estimation of the cost of decommissioning and hence the establishment of a financial guarantee.

Additionally, during the operation phase and at the time the licensee makes a decision to cease commercial operation, the CNSC requests an end-of-commercial operation (ECO) plan to outline the steps for continued safe operation, shutdown and stabilization of the facility.

For the decommissioning phase, typically one of two strategies may be followed:

1. **immediate decommissioning:** comprises immediate dismantling of the facility
2. **deferred decommissioning:** comprises a period of storage with surveillance followed by dismantling

For either strategy, the decommissioning plan (normally called a detailed decommissioning plan or DDP) provides more detail on the decommissioning strategy and the actual licensed activities that will be undertaken. It is also used to verify the estimation of the cost of decommissioning and hence the maintenance of the financial guarantee.

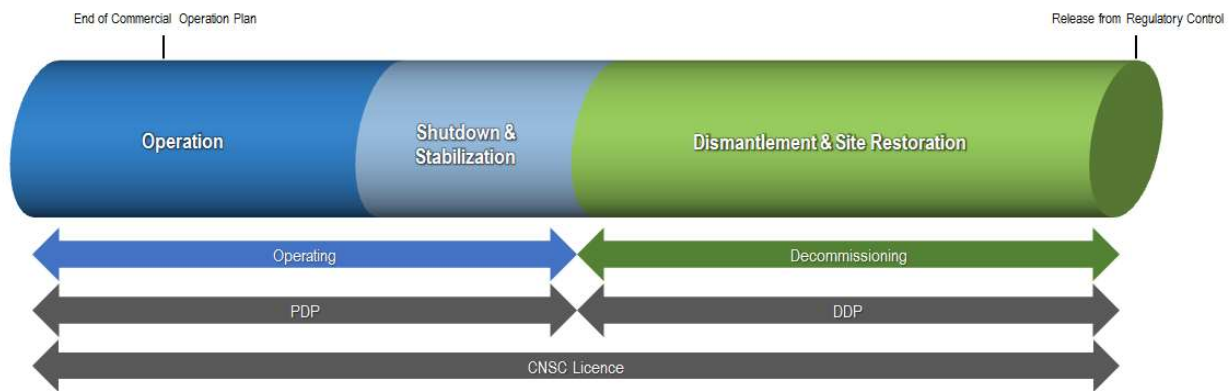
For immediate decommissioning, the decommissioning plan articulates the details of the execution of the decommissioning strategy and the detailed work packages that will be used to guide the dismantling work

typically covering a 2- to 10-year period. For deferred decommissioning, the decommissioning plan is initially focused on the storage with surveillance period, which typically covers 25 to 40 years. Then, towards the end of storage with surveillance, it is revised to detail the work to be completed during the dismantling of the installation. In both cases, there will be a typical period of 7 to 10 years where the spent fuel will be stored in the irradiated fuel bays for cooling. After this initial cooling period, the spent fuel is transferred to dry storage.

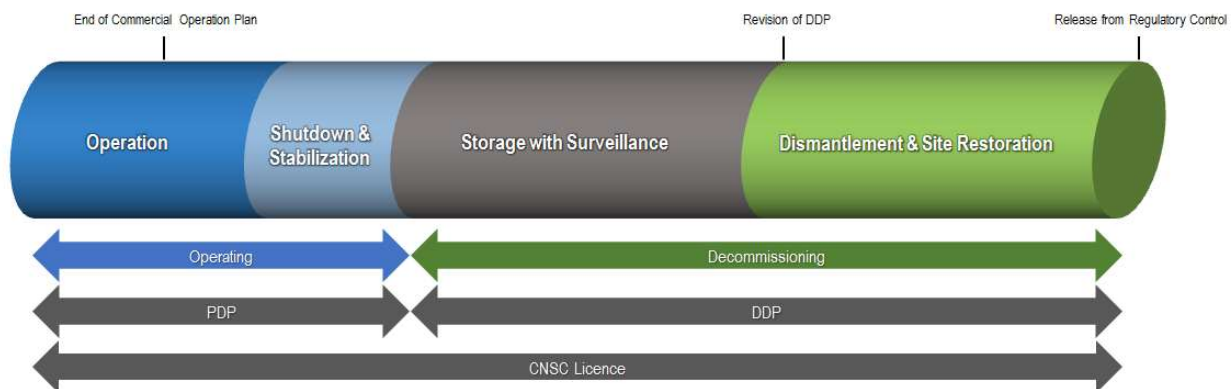
### C.3 Regulatory Process and Timeframe

Figures 1 and 2 depict the respective regulatory steps for immediate and deferred decommissioning, starting at the operation phase of the facility.

**Figure 1. Immediate Decommissioning**



**Figure 2. Deferred Decommissioning**



#### C.3.1 End of commercial operation

During operation, a licensee will identify a target date for end-of-commercial operation (ECO) of the facility. Normally, this would occur several years in advance which allows plans to be developed and implemented to assure continued safe operations over the final years and a smooth transition of the facility into safe shutdown and eventual implementation of the planned decommissioning strategy.

At this point, the CNSC requires the licensee to develop a plan for the facility’s ECO. This is a broad plan that comprises steps for approaching shutdown and the facility’s transition from shutdown to a stable state

(i.e. stabilization activities). For stabilization of the facility, key activities are: defueling the reactor, draining and storing of the cooling water from the reactor main systems, draining water from secondary and auxiliary cooling systems, cleaning and decontaminating, maintaining cooling for the irradiated fuel bays (IFBs), transferring the spent fuel to dry storage, modifying the operating conditions /programs to align with the state of the facility, performing extensive radiological surveys and maintaining routine surveillance of the facility.

Stabilization activities can be performed under a CNSC licence for operation or for decommissioning depending on how the licensee transitions the facility to storage with surveillance or dismantlement. For example, the transfer of spent fuel from the IFB to dry storage could be started under operation but completed under decommissioning.

### **C.3.2 Storage with surveillance**

If deferred decommissioning is chosen, the facility is placed into a period of storage with surveillance (nominally 25 to 40 years) prior to the dismantlement phase (note that if immediate decommissioning is implemented, there will be no storage with surveillance period). During this period, the activities are much reduced and focused on surveillance, inspection, servicing and maintenance to confirm that the structures, systems and components needed to maintain safe storage are functioning as required.

Examples of physical systems needed for storage with surveillance include:

- electrical power
- emergency lighting
- drainage, heating and ventilation
- security monitoring
- fire detection
- safeguards
- remote monitoring systems.

Examples of programs needed include:

- radiation protection
- environmental protection
- occupational health and safety
- training
- aging management

During storage with surveillance, there will be opportunities for activities to reduce risks at the facility. These include:

- reduction or removal of combustibles
- removal and recycling of non-contaminated or slightly-contaminated equipment (e.g., turbines, pumps, heat exchangers)
- reduction or isolation of asbestos
- demolition of non-nuclear facilities
- removal of radioactive waste to an off-site licensed storage facility
- reduction or removal of hazardous wastes

The CNSC requires, at this point, a decommissioning plan that details the programs and activities that will be maintained during storage with surveillance. This decommissioning plan would be later revised to detail the dismantling work to be completed. The financial guarantee, covering the period of storage with

surveillance, eventual dismantlement of the facility, and any long-term monitoring, would be reviewed and updated periodically (typically around five years) as per licence requirements.

### **C.3.3 Dismantling**

Dismantling is one of the last steps in the decommissioning process (nominally 2 to 10 years to dismantle). The facility is carefully dismantled, all resulting waste is disposed of appropriately and site restoration activities are performed to achieve the end state objectives for the installation.

The CNSC requires, at this point, details of the strategy and schedule of the execution of the physical work. In broad terms, this is called a detailed work breakdown structure (WBS). The following are examples of what should be included in the WBS:

- how the dismantled structures and components will be segregated and disposed of (e.g., clean vs contaminated)
- the measures to be taken to protect workers from conventional and radiological hazards
- the post-dismantlement monitoring activities (e.g., radiation protection and environmental) to demonstrate that the decommissioning objectives have been met

### **C.3.4 Release from CNSC regulatory control**

Release from CNSC regulatory control occurs when the licensee has successfully decommissioned the facility and restored the site to a state in which it can be released for future use (e.g., green field or brown field [industrial]). If unrestricted release cannot yet be achieved (i.e., due to long-term presence of contaminated systems, components or structures), a release under institutional controls (IC) could be done if the host province has an appropriate IC regime in place.

The CNSC requires, at this point, a submission for a licence to abandon or exemption from licensing. The submission needs to be supported by reports on the results of the decommissioning and site-restoration activities as well as the results of the radiological and environmental monitoring to demonstrate that the site no longer needs to be licensed under the *Nuclear Safety and Control Act* (NSCA).

## **C.4 Environmental Assessment and Licensing**

For a proposed new reactor facility, an environmental assessment (EA) under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), would be conducted that covers the entire reactor lifecycle.

For an existing reactor transitioning from an operational state to a decommissioned state, an EA under the NSCA would be conducted. The EA under the NSCA would assess the impacts of all the planned licensed activities and would be commensurate with the potential risks of those activities. An EA under the NSCA is carried out at every phase throughout the lifecycle of a facility. At each phase (i.e., for each licence application), CNSC staff consider all future phases of the lifecycle, taking into consideration available information.

The EA under the NSCA informs the licensing decision on whether the applicant or licensee will, in carrying on a licensed activity, make adequate provision for the protection of the environment and the health of persons. An EA report for an EA under the NSCA is prepared by CNSC staff for each subsequent licence application for an existing licensed facility or activity.

For licensing, the Commission would consider the qualifications of the applicant / licensee and the effectiveness of measures being proposed against the requirements of the NSCA prior to rendering a regulatory decision to allow the requested activities. Note that there is flexibility in the licensing approach

in that an applicant / licensee may choose to combine some or all of the lifecycle phases into a single licence application rather than treating each separately.

Over the lifecycle of the facility, the licensing basis (i.e., licensed activities conducted under the licensee's programs which meet the relevant regulatory requirements) will be adjusted accordingly to reflect the appropriate phase in the lifecycle.

## **C.5 Examples of Implementation of the Regulatory Process**

### **C.5.1 Pickering**

The CNSC is applying this approach to the Pickering Nuclear Generating Station (Pickering) where the end of commercial operation (ECO) is currently targeted for the period between 2020 and 2024. As of 2016, Units 2 and 3 were in safe storage while units 1, 4, and 5 to 8 were continuing to operate safely. OPG established an ECO strategy, which included a sustainable operations plan (SOP) for the approach to shutdown of the remaining operating units, a stabilization activity plan (SAP) for transitioning to a stable state, a decommissioning plan, and the associated financial guarantee under its operating licence. When shutdown approaches, OPG will update its decommissioning plan to reflect the activities it plans to carry out.

### **C.5.2 Gentilly-2**

The provincial decision to shut down Gentilly-2 NPP was made just a few months before the actual shutdown, so there was little opportunity for Hydro-Québec to develop an ECO strategy. Nonetheless, the CNSC required Hydro-Québec to develop a plan to guide the safe shutdown and stabilization of the facility. As of 2016, Hydro-Québec was granted a decommissioning licence for the facility under which there was an updated decommissioning plan and associated financial guarantee. Under this licence, Hydro-Québec continued to transfer spent fuel from the IFB to dry storage. Hydro-Québec chose a deferred decommissioning strategy and therefore was required to update its detailed decommissioning plan by 2019. It is anticipated that the plan will cover a 40-year storage-with-surveillance period, after which it is expected to be updated to cover the planned five-year dismantlement period of the facility.

## Glossary

### **applicant**

An organization or person that has applied to the CNSC for a licence or for certification. For example, an applicant that applies for a licence to construct a nuclear facility has the overall responsibility, and controlling and coordinating authority, for overseeing the safe and satisfactory completion of all design, procurement, manufacturing, construction and commissioning work.

### **Class I nuclear facility**

A Class IA facility or a Class IB facility. (Source: *Class I Nuclear Facilities Regulations*)

### **Class IA facility**

A Class IA facility is a nuclear fission or fusion reactor or subcritical nuclear assembly; and a vehicle that is equipped with a nuclear reactor. (Source: *Class I Nuclear Facilities Regulations*)

### **Class IB facility**

A Class IB facility means any of the following facilities:

- (a) a facility that includes a particle accelerator, other than a particle accelerator described in paragraphs (d) and (e) of the definition “Class II prescribed equipment” in section 1 of the *Class II Nuclear Facilities and Prescribed Equipment Regulations*
- (b) a plant for the processing, reprocessing or separation of an isotope of uranium, thorium or plutonium
- (c) a plant for the manufacture of a product from uranium, thorium or plutonium
- (d) a plant, other than a Class II nuclear facility as defined in section 1 of the *Class II Nuclear Facilities and Prescribed Equipment Regulations*, for the processing or use, in a quantity greater than  $10^{15}$  Bq per calendar year, of nuclear substances other than uranium, thorium or plutonium
- (e) a facility for the disposal of a nuclear substance generated at another nuclear facility
- (f) a facility prescribed by paragraph 19(a) or (b) of the *General Nuclear Safety and Control Regulations*. (Source: *Class I Nuclear Facilities Regulations*)

### **environmental assessment (EA)**

An evaluation of the potential significant short-term and long-term adverse environmental effects of a project on the surrounding environment.

### **intervenor**

A person who is permitted to intervene at a public hearing under rule 19 of the *Canadian Nuclear Safety Commission rules of Procedure*. **Note:** The intervenor is a person who has an interest, expertise or information useful to the Commission in coming to a decision.

### **licensed activity**

An activity described in paragraph 26(e) of the Act that a licence authorizes the licensee to carry on in relation to a Class I nuclear facility. (Source: *Class I Nuclear Facilities Regulations*)

OR

An activity described in paragraph 26(e) of the Act that a licence authorizes the licensee to carry on in relation to a uranium mine or mill. (Source: *Uranium Mines and Mills Regulations*)

**licensee**

**Note:** In the regulations below, a person may be an individual or organization.

A person who is licensed to carry on an activity described in paragraph 26(e) of the *Nuclear Safety and Control Act* in relation to a Class I nuclear facility (Source: *Class I Nuclear Facilities Regulations*)

OR

A person who is licensed to carry on an activity described in paragraph 26(e) of the *Nuclear Safety and Control Act* in relation to a uranium mine or mill. (Source: *Uranium Mines and Mills Regulations*).

**licensing basis**

A set of requirements and documents for a regulated facility or activity comprising:

- the regulatory requirements set out in the applicable laws and regulations
- the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence
- the safety and control measures described in the licence application and the documents needed to support that licence application

**mill**

A facility at which ore is processed and treated for the recovery of uranium concentrate, including any tailings-handling and water treatment system associated with the facility (Source: *Uranium Mines and Mills Regulations*).

**mine**

An excavation site and a removal site (Source: *Uranium Mines and Mills Regulations*).

**Note:** A mine includes both these sites.

**structures, systems and components (SSCs)**

A general term encompassing all of the elements of a facility or activity that contribute to protection and safety. Structures are the passive elements: buildings, vessels, shielding, etc. A system comprises several components, assembled in such a way as to perform a specific (active) function. A component is a discrete element of a system. Some examples are wires, transistors, integrated circuits, motors, relays, solenoids, pipes, fittings, pumps, tanks and valves.

## References

1. Canadian Nuclear Safety Commission (CNSC), RD-99.3, *Public Information and Disclosure*, Ottawa, 2012.
2. CNSC, RD/GD-369, *Licence Application Guide: Licence to Construct a Nuclear Power Plant*, 2011
3. CNSC, G-379, *Guide for Applicants and Intervenors: Writing CNSC Commission Member Documents*, 2012.



## CNSC Regulatory Document Series

Facilities and activities within the nuclear sector in Canada are regulated by the Canadian Nuclear Safety Commission (CNSC). In addition to the *Nuclear Safety and Control Act* and associated regulations, these facilities and activities may also be required to comply with other regulatory instruments such as regulatory documents or standards.

Effective April 2013, the CNSC's catalogue of existing and planned regulatory documents has been organized under three key categories and twenty-five series, as set out below. Regulatory documents produced by the CNSC fall under one of the following series:

### 1.0 Regulated facilities and activities

Series	1.1	Reactor facilities
	1.2	Class IB facilities
	1.3	Uranium mines and mills
	1.4	Class II facilities
	1.5	Certification of prescribed equipment
	1.6	Nuclear substances and radiation devices

### 2.0 Safety and control areas

Series	2.1	Management system
	2.2	Human performance management
	2.3	Operating performance
	2.4	Safety analysis
	2.5	Physical design
	2.6	Fitness for service
	2.7	Radiation protection
	2.8	Conventional health and safety
	2.9	Environmental protection
	2.10	Emergency management and fire protection
	2.11	Waste management
	2.12	Security
	2.13	Safeguards and non-proliferation
	2.14	Packaging and transport

### 3.0 Other regulatory areas

Series	3.1	Reporting requirements
	3.2	Public and Aboriginal engagement
	3.3	Financial guarantees
	3.4	Commission proceedings
	3.5	CNSC processes and practices
	3.6	Glossary of CNSC terminology

**Note:** The regulatory document series may be adjusted periodically by the CNSC. Each regulatory document series listed above may contain multiple regulatory documents. For the latest list of regulatory documents, visit the [CNSC's website](#).