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Licensing Process for New Nuclear Power Plants in Canada

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LICENSING PROCESS FOR NEW NUCLEAR POWER PLANTS IN CANADA

EXECUTIVE SUMMARY

This document is the first revision of INFO-0756, initially published in February 2006. The most significant update to the original document is the addition of information concerning the joint review panel process which allows the processes for environmental assessment and licensing to prepare a site to run concurrently (during the same time frame). A Joint Review Panel is established as a single body, to make appropriate decisions about the environmental assessment, and the application for a licence to prepare a site. While these processes now run concurrently, the decisions by the Joint Review Panel are still taken at different stages.

Other changes in the document reflect the knowledge acquired by the Canadian Nuclear Safety Commission (CNSC) in its review of the new nuclear power plant applications received since 2006.

This document covers only the major steps in licensing a new nuclear power plant. It does not address any approvals that may be required once the licences (to prepare a site, construct, operate or decommission) are issued, nor does it list the technical requirements used to support the assessment of licence applications.

This document describes the licensing process for new nuclear power plants in Canada, taking into consideration the requirements and regulations made under the *Nuclear Safety and Control Act* (NSCA) — the cornerstone of the CNSC regulatory framework.

The CNSC is currently updating its regulatory framework for licensing new nuclear power plants. The updated framework will reflect Canada's commitment to international standards and best practices, including the International Atomic Energy Agency's (IAEA) nuclear safety standards. The IAEA's standards set out high-level safety goals that apply to all reactor designs. This alignment to international standards and best practices allows the CNSC to build on the most recent advancements in safety, and on the experiences of the international regulatory community, in order to enhance Canadian requirements. Canadians, therefore, can be assured that any new nuclear power plants built in Canada will meet the highest standards for health, safety, security and environmental protection.

The Government of Canada has recently created the Major Projects Management Office (MPMO) — an initiative to coordinate the development and implementation of an integrated federal project plan throughout the environmental assessment, the licensing and permitting processes and the aboriginal consultation phases. The CNSC is a participant in the MPMO initiative with respect to major nuclear projects, including new nuclear power plants. The MPMO will also track and monitor new nuclear power plant projects as they proceed through the regulatory review. For further information, please refer to <http://www.mpmo-bggp.gc.ca>.

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1. INTRODUCTION

The Canadian Nuclear Safety Commission (CNSC) is mandated, under the *Nuclear Safety and Control Act* (NSCA), for regulating all the nuclear facilities and nuclear-related activities in Canada. 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, they must obtain a licence issued by the CNSC.

This document provides an overview of the process for licensing new nuclear power plants in Canada, taking into consideration the requirements of the NSCA and associated regulations. The description of the process also takes into account a key prerequisite for a licence to be issued by the Commission, which is the completion of an Environmental Assessment (EA) pursuant to the *Canadian Environmental Assessment Act* (CEAA).

2. THE CANADIAN NUCLEAR SAFETY COMMISSION

The Parliament of Canada first established legislative control and federal jurisdiction over the development and use of nuclear energy and nuclear substances in 1946, with the introduction of the *Atomic Energy Control Act* (AECA) which also established the Atomic Energy Control Board (AECB). Fifty years later, it became necessary to update the regulatory requirements, in order to include protection of the environment, health, safety and security. The Canadian Nuclear Safety Commission was established as the successor to the AECB, when the NSCA came into force in May 2000.

The CNSC regulates the use of nuclear energy and materials to protect health, safety, security and the environment, and to respect Canada's international commitments on the peaceful use of nuclear energy¹. It is an independent quasi-judicial agency which reports to Parliament through the Minister of Natural Resources. Nuclear regulation is solely federal jurisdiction, and the CNSC has no provincial counterparts. The CNSC is comprised of the Commission Tribunal and the CNSC staff organization². The Commission Tribunal is a quasi-judicial tribunal and court of record, which is responsible to:

- make transparent decisions on the licensing of nuclear-related activities in Canada;
- establish legally binding regulations;
- set regulatory policy direction on matters relating to health, safety, security and environmental issues affecting the Canadian nuclear industry.

The CNSC staff reviews applications for licences, according to the regulatory requirements of the NSCA, as well as CNSC regulations and regulatory documents, while taking into consideration input from other departments and agencies. The staff also makes recommendations to the Commission, and enforces compliance with the NSCA, regulations, and any licence conditions imposed by the Commission.

1 The CNSC's mandate is set out in Section 9 of the *Nuclear Safety and Control Act*.

2 The Canadian Nuclear Safety Commission is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

Through the NSCA, the Commission has the authority to make and enforce regulations and licence conditions in the areas of health, safety, security and environmental protection related to nuclear energy, and with respect to the implementation of Canada's policies and obligations concerning the non-proliferation of nuclear weapons.

In making a licensing decision, the Commission considers the applicant's request, recommendations from CNSC staff, and any written or oral presentations from intervenors (including the public) made during public hearings. The *CNSC Rules of Procedure* — available at www.nuclearsafety.gc.ca — set out requirements for the participation in public hearings held by the Commission. Section 6 of this document provides additional information on public participation in the licensing process.

On behalf of the Government of Canada, the CNSC implements the *Safeguards Agreement and Additional Protocol* between Canada and the International Atomic Energy Agency (IAEA), for the verification of Canada's commitments concerning the peaceful use of nuclear energy and materials. The CNSC also cooperates with other national governments, in order to ensure compliance with the terms and conditions of Canada's bilateral nuclear cooperation agreements, and in advancing multilateral nuclear non-proliferation arrangements.

3. THE NUCLEAR REGULATORY FRAMEWORK IN CANADA

The *Nuclear Safety and Control Act* is the cornerstone of the CNSC's regulatory framework, which consist of regulations and licence conditions developed under the Sections 9(b) and 21(1) (e) of the NSCA.

Regulatory documents are issued by the CNSC to provide guidance to licence applicants with regards to the acceptable ways of complying with regulatory requirements, and form the basis for the assessment of licence applications. All regulatory documents are developed through a transparent consultative process with stakeholders (which include licensees, government, non-governmental organizations and the general public.)

The CNSC is presently updating its regulatory framework for licensing new nuclear power plants. The updated framework will draw upon international standards and best practices, including the IAEA's nuclear safety standards, to the extent practicable to enhance Canadian requirements. These standards set out high-level safety goals and requirements, which apply to all reactor designs.

Canada has been an active participant in the development of IAEA nuclear safety standards, as well as the drafting of technical documents, which provide more specific technical requirements and best practices for the siting, design, construction, operation, decommissioning and abandonment of nuclear power plants. The IAEA standards and technical documents have served as references and benchmarks for the CNSC's nuclear regulatory requirements for many years.

While the continued successful operation of nuclear power plants throughout the world shows that they can be operated safely, just like any other complex technology (such as airplanes and automotive vehicles), new ideas and advances in engineering always provide room for safety improvements. The alignment to international standards and best practices allows the CNSC to

build on the most recent advancements in safety, and on the experiences of the world's regulatory community, in order to enhance Canadian requirements. Canadians, therefore, can be assured that any new nuclear power plants built in Canada will meet the highest standards for health, safety, security and environmental protection.

It is important to note that it is the responsibility of licence applicants to choose the nuclear power plant technology that best meets the safety goals, as well as their corporate business plans and strategies. The CNSC's regulatory framework does not limit the choice of technology available to companies who may wish to build and operate new nuclear power plants in Canada. However, any proposed reactor technology will need to meet the regulatory requirements for health, safety, security and environmental protection.

Section 26 of the NSCA prohibits any person from preparing a site, constructing, operating, decommissioning or abandoning a nuclear facility without a licence granted by the Commission. Section 24(4) of the NSCA further states that "no licence may be issued unless, in the opinion of the Commission, the applicant:

- is qualified to carry on the activity that the licence will authorize the licensee to carry on; and
- will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed."

Licences granted by the Commission may contain conditions that must be met by licensees, in addition to the responsibility for meeting the requirements of the NSCA and associated regulations. The regulations, issued under the NSCA, that apply to nuclear power plants are:

- the *General Nuclear Safety and Control Regulations*;
- the *Radiation Protection Regulations*;
- the *Class I Nuclear Facilities Regulations*;
- the *Nuclear Substances and Radiation Devices Regulations*;
- the *Packaging and Transport of Nuclear Substances Regulations*;
- the *Nuclear Non-Proliferation Import and Export Control Regulations*; and
- the *Nuclear Security Regulations*.

These regulations provide licence applicants with general performance criteria, and list the information which all applicants must submit to the CNSC as part of the licence application. Applications for licences must be accompanied by licence fees, as set out in the *CNSC Cost Recovery Fees Regulations*, which is available at www.nuclearsafety.gc.ca.

Other legislation, enacted by Parliament, with which the applicants are required to comply includes, but is not limited to:

- the *Nuclear Liability Act*;
- the *Nuclear Fuel Waste Management Act*;
- the *Canadian Environmental Assessment Act*;
- the *Canadian Environmental Protection Act 1999*;

- the *Fisheries Act*;
- the *Species at Risk Act*;
- the *Migratory Bird Convention Act*; and
- the *Canada Water Act*.

4. LICENSING PROCESS FOR NEW NUCLEAR POWER PLANTS

Under the NSCA, the licensing process is initiated by an application sent by the proponent³ to the CNSC. The *CNSC Rules of Procedure* — available at www.nuclearsafety.gc.ca. — state that the application must be filed with the Secretary of the Commission, along with the prescribed fees.

In the CNSC's regulatory regime, nuclear power plants are defined as Class I nuclear facilities, and the regulatory requirements for these facilities are found in the *Class I Nuclear Facilities Regulations*. The regulations also require separate licences for each of the five phases in the lifecycle of a nuclear power plant:

1. a licence to prepare a site;
2. a licence to construct;
3. a licence to operate;
4. a licence to decommission; and
5. a licence to abandon⁴.

The CNSC's assessment of the information submitted by applicants in support of their application is carried out along with input from other federal and provincial government departments and agencies responsible for regulating health and safety, environmental protection, emergency preparedness, and the transportation of dangerous goods. Separate licences are granted for each phase in the lifecycle of the nuclear power plant, and would be issued in sequence. However, the applications to prepare a site, to construct and to operate a new nuclear power plant may be assessed in parallel. Additional information on the licensing process, under the NSCA, is provided in section 4.2 of this document.

In addition to the five licensing stages pursuant to the NSCA and its regulations, Section 5(1)(d) of the CEAA stipulates that an EA must be carried out, so as to identify whether a project is likely to cause significant adverse environmental effects, before any federal authority could issue a permit or licence, grant an approval, or take any other action for the purpose of enabling the project to be carried out in whole or in part. More information on EAs is available in the next section of this document.

The Government of Canada has recently created the Major Projects Management Office (MPMO) — an initiative to coordinate the development and implementation of an integrated federal project plan throughout the Environmental Assessment, the licensing and permitting processes and the aboriginal consultation phases. The CNSC is a participant in the MPMO initiative with respect to major nuclear projects, including new nuclear power plants. The MPMO will also track and monitor new nuclear power plant projects as they proceed through the regulatory review. For further information, please refer to <http://www.mpmo-bggp.gc.ca>.

³ Reference to proponent is interchangeable with licence applicant.

⁴ Licences to abandon nuclear power plants are not discussed further in this document.

4.1 A Prerequisite for Licensing: Environmental Assessment under the *Canadian Environmental Assessment Act*

Environmental assessments (EAs) are carried out to meet the requirements of the *Canadian Environmental Assessment Act* (CEAA). EAs identify whether a specific project is likely to cause significant environmental effects, and determine whether those effects can be mitigated. By considering environmental effects and mitigation early in project planning, potential delays and unnecessary costs can be avoided or reduced.

For new nuclear power plants, the CNSC initiates an EA when a proponent applies under the NSCA for a licence to prepare the site and submits a complete Project Description. Federal departments and agencies will use this Project Description to determine if any associated regulatory decisions need to be made, and to determine if an EA under CEAA will be required.

Before any licensing decision can be made with respect to a new nuclear power plant, the EA must be completed. EAs examine the five phases in the lifecycle of a nuclear power plant: siting, construction, operation, decommissioning and abandoning.

Large-scale and environmentally-sensitive projects, such as nuclear power plants, usually undergo an environmental assessment called a comprehensive study, which mandates public participation (nuclear power plants are included in the CEAA's *Comprehensive List Study Regulations*, which identifies the projects for which comprehensive studies are mandatory.) The EA for a new nuclear power plant project would not be conducted as a comprehensive study if the project is referred to a panel or a mediator by the federal Minister of the Environment, following a recommendation by the Commission. A project's EA is referred for review by a panel (also referred to as a "review panel") in the following cases:

- when it may cause significant adverse environmental effects, even after taking into account mitigation measures;
- when it is uncertain whether a project will cause significant environmental effects, given the implementation of mitigation measures; or
- where public concerns warrant referral.

If a decision is made to refer the EA of a new nuclear power plant to a review panel, the CEAA provides for one of the following three approaches to be taken:

- a review conducted by a panel appointed by the Minister of the Environment;
- a substitution arrangement, whereby the Commission process is used as a complete substitute for a review panel; or
- a joint review (panel) process, through the Panel of the Commission, whereby the Commission (represented by two or more members) is supplemented with temporary member(s) appointed by the Minister of the Environment.

The approach chosen for the review of the environmental assessment by a panel would require approval by the federal Minister of the Environment. The procedures for the conduct of the review by a panel would depend on the approach selected, but would incorporate, as appropriate,

the procedures set out in the 1997 Ministerial Guidelines entitled *Procedures for an Assessment by a Review Panel* (available at http://www.ceaa-acee.gc.ca/013/0001/0007/panelpro_e.htm).

The key documents involved in a review panel are:

- Terms of Reference for the panel: issued by the Minister of the Environment, after public consultation;
- Environmental Impact Statement Guidelines: developed by federal departments and agencies or the panel, after public consultation, and issued to the licence applicant, which also include information requirements for the site preparation licence decision;
- Environmental Impact Statement (EIS): developed by the proponent (licence applicant), in response to the requirements of the Environmental Impact Statement Guidelines;
- Report of the review panel: prepared by the panel following public hearings about the EIS submitted to the Minister of the Environment, and made available to the public; and
- Government Response: prepared by the responsible authority (the CNSC with the Canadian Environmental Assessment Agency), in consultation with other federal government departments, and submitted for approval by the Governor in Council, before being released to the proponent and the public.

Given the potential for overlapping EAs, the CEAA allows the federal Minister of the Environment to enter into agreements with provincial and territorial governments relating to the EA of projects where both governments have an interest, through a Joint Review Panel. Existing agreements provide guidelines for the roles and responsibilities of each government in the assessment of such projects (http://www.ceaa.gc.ca/013/agreements_e.htm).

Major projects such as construction and operation of a nuclear power plant also have the potential to impact the exercise of Aboriginal rights in the region where a nuclear power plant is proposed. As a regulatory agency, the CNSC must satisfy itself that the Crown's duty to consult and, if appropriate, accommodate, has been met towards Aboriginal communities whose rights may be impacted. This duty applies throughout the life-cycle of the project, including pre-submission licensing phase, the Environmental Assessment phase, the licensing phase and follow-up activities once operation of the nuclear power plant begins.

4.2 Licensing Process under the *Nuclear Safety and Control Act*

The process followed by the CNSC for the assessment of a licence application under the NSCA is depicted in the process map in Figure 1 (see end of document). This process map shows key activities carried out by the applicant, CNSC staff and the Commission. Since the application for a licence to prepare site triggers the EA process, the EA covers the entire lifecycle of the nuclear power plant. Additional EAs for other licensing stages – after the licence to prepare site – will not be required. The information to be provided by the applicant when applying for a licence for site preparation, or construction, operation or decommissioning of a nuclear power plant is specified in:

- Section 3 of the *General Nuclear Safety and Control Regulations*;
- Sections 3 through 7 of the *Class I Nuclear Facilities Regulations*;

- the *Nuclear Security Regulations*;
- the *Radiation Protection Regulations*;
- the *Packaging and Transport of Nuclear Substances Regulations*; and
- the *Nuclear Substances and Radiation Devices Regulations*.

Licence applications must contain all of the information specified in the regulations mentioned above. This information should be comprehensive and complete at the time the application is submitted, so that the CNSC's assessment of the application can be as effective and efficient as possible, and so that any concerns can be identified at the earliest possible time. This, in turn, will optimize the time needed by CNSC staff to carry out the regulatory assessment and prepare recommendations regarding the application for consideration by the Commission. In addition, information on decommissioning plans and financial guarantees for the new nuclear power plant are required early in the licensing process. The *Class I Nuclear Facilities Regulations* require applicants to provide information on the proposed plan for decommissioning their nuclear facility or site.

In addition to the details concerning decommissioning plans, the *General Nuclear Safety and Control Regulations* require that information on financial guarantees should accompany licence applications. Financial guarantees are required in order to ensure that sufficient funds are available for decommissioning activities at any licensing stage (including the plant, at the end of its useful life) and for the long-term management of spent nuclear fuel. Information on proposed financial guarantees should include any obligations for funding the decommissioning and long-term management of nuclear fuel waste, pursuant to the *Nuclear Fuel Waste Management Act*.

In accordance with the *Nuclear Safety and Control Act* (NSCA) and the *Class I Nuclear Facilities Regulations*, an applicant must file separate applications for licences: first, to prepare a site; later, to construct; and then to operate the facility. While the Commission will make decisions regarding these licences in sequence, there are some processes that licence applicants may pursue in parallel, according to their own project risk assessments. For example, if an applicant decides to submit an application for a *Licence to Construct* in parallel with the EA and *Licence to Prepare Site* process, there is no need to duplicate the information already submitted in the EIS and application for a licence to prepare site.

All regulatory work performed by the CNSC in reviewing and assessing the information pursuant to licence applications is cost recovered from the licence applicants. It is important to note that any information submitted in support of a licence application will be made public, except for prescribed information, or information protected under the provisions of the *Access to Information Act* (such as security-related or commercially-sensitive data).

Early communication with the CNSC can help the applicant develop a good understanding of the regulatory requirements for new nuclear power plants, the licensing process and the information to be submitted in support of a licence. Early communications also enable the CNSC to plan for the regulatory review, including making sure that adequate staff is available to carry out the regulatory assessment.

4.2.1 Site Preparation

Prior to issuing a licence to prepare the site for construction of a nuclear power plant, the Commission must be satisfied that it is feasible to perform the site preparation activities in a manner that will satisfy all health, safety, security and environmental protection requirements. In addition, the Commission cannot issue a site preparation licence, unless a decision as a result of the EA has been made, indicating that the project may proceed.

The CNSC will also need to be assured that the site meets all applicable regulatory requirements.

The following aspects are considered in the evaluation of the suitability of a site over the life of a nuclear power plant:

- the potential effects of external events (such as seismic events, tornadoes and flood) and human activity on the site;
- 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; and
- 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.

Under the regulations, an applicant must submit, for any licence, a Project Description of the facility and plans showing the location, perimeter, areas, structures and systems of the facility. An application for a *Licence to Prepare Site* does not require detailed information or determination of a reactor design; however, high level design information is required for the environmental assessment that precedes the licensing decision for a *Licence to Prepare Site*. An application for a *Licence to Construct* must contain more detailed information about the reactor design and a supporting safety case (additional information on the construction licensing process is provided in section 4.2.2 of this document).

Specific information required to obtain a *Licence to Prepare Site* is listed in Section 4 of the *Class I Nuclear Facilities Regulations* (available at <http://www.nuclearsafety.gc.ca>).

The goal of the CNSC, during the site preparation stage, is to ensure that the site characteristics which may have an impact on health, safety, security and the environment have been identified, and that these characteristics can and will be taken into consideration in the design, operation and decommissioning of the proposed nuclear power plant. 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 nuclear power plant, and must be included in the application.

The CNSC staff's conclusions and recommendations from technical reviews are documented in reports submitted to the Commission. It is the Commission, not the CNSC staff, which issues the *Licence to Prepare Site* after holding a public hearing, where all parties (applicant, CNSC staff and intervenors) have the opportunity to participate. As noted earlier, the Commission will not issue a licence unless it is satisfied that the applicant will make adequate provisions to protect

health, safety, security and the environment, and to respect international obligations to which Canada has agreed. It is the responsibility of the applicant to demonstrate that it will make any such adequate provisions, when applying for a licence.

Licences are typically issued with conditions, which may include “hold points” where CNSC approval is required before further work may proceed.

4.2.1.1 Joint Review Panel: Concurrent Environmental Assessment and Site Preparation Licence

The Environmental Assessment (under the CEAA) and the *Licence to Prepare Site* (under the NSCA) have overlapping but distinct information requirements. For instance, an EA requires more information about potential accidents and incidents than the CNSC regulations require in a *Licence to Prepare Site*. Conversely, the CNSC regulations require information that is not typically included in an EA, such as Section 4(d) of the *Class I Nuclear Facilities Regulations*, which requires submission of the proposed quality assurance program for the design of the facility.

Both environmental assessment and licensing (to prepare a site) processes occur concurrently when a project undergoes a Joint Review Panel process (see section 4.1). This ensures that the information submitted by the proponent can be considered by public and government agencies through a single process, and any appropriate decisions under EA and licensing can be made by a single body — the Joint Review Panel.

The combined EA and licensing procedure, under the Joint Review Panel process, is illustrated in Figure 2 (see end of document).

Key documents in a Joint Review Panel process are:

- the Joint Review Panel Agreement, which gives the terms of reference for the Joint Review Panel;
- the Environmental Impact Statement (EIS) Guidelines, which provide instructions to the proponent on how to prepare the EIS and the application for a *Licence to Prepare Site*.

The Canadian Environmental Assessment Agency and the CNSC invite the public and other stakeholders to comment on both documents, before they are published in the final form by the federal Minister of the Environment.

Once the documents are published, the EIS Guidelines are provided to the licence applicant, and a Joint Review Panel is appointed.

A proponent uses the EIS Guidelines to prepare and submit the EIS and other documents in support of the application for *Licence to Prepare Site*. Through a public technical review, the Joint Review Panel considers the advice of CNSC staff, other government departments and agencies, and the comments provided by the Aboriginal groups, the public and other stakeholders. The Panel will require the proponent to submit additional information until the

Panel is satisfied that the intent of the EIS Guidelines is met, and there is sufficient information to proceed to the public hearings.

At the hearings, the Joint Review Panel hears interventions about the EIS from the public and other stakeholders to consider the evidence presented. Upon the completion of the hearings, the Joint Review Panel prepares and submits a report on the environmental assessment of the project to the Minister of the Environment, who makes the report available to the public.

After considering this report, the Governor in Council approves a Government Response. The response includes a recommendation on whether the CNSC can proceed to issue a license. Subject to the Governor in Council recommendation, the Joint Review Panel may issue the *License to Prepare Site* for a new nuclear power plant. At this stage, the Joint Review Panel would have met its responsibilities, and would no longer be involved with the subsequent licensing phases of a new nuclear power plant project.

4.2.2 Construction

When applying for a *License to Construct* a nuclear power plant, it is the responsibility of the applicant to demonstrate to the CNSC that the proposed design of the nuclear power plant conforms to regulatory requirements, and will provide for the safe operation on the designated site over the proposed life of the facility. The information required in support of the application to construct a nuclear power plant includes, for example:

- a description of the proposed design for the nuclear power plant, taking into consideration the physical and environmental characteristics of the site;
- environmental baseline data, on the site and surrounding area;
- a Preliminary Safety Analysis Report, showing the adequacy of the design;
- 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; and,
- programs and schedules for recruiting and training operations and maintenance staff.

A more complete listing of the information required to obtain a *License to Construct* a nuclear power plant is listed in Section 5 of the *Class I Nuclear Facilities Regulations* (available at <http://www.nuclearsafety.gc.ca>).

After the construction licence application has been received, the CNSC performs a comprehensive assessment of the design documentation, the Preliminary Safety Analysis Report, the construction program, and any other information required by the regulations. The assessment focuses on determining whether the proposed design and safety analysis, along with other required information, meet regulatory requirements. Specifically, the evaluation involves rigorous engineering, scientific analysis and engineering judgment, taking into consideration the CNSC's experience and knowledge of the best practices in nuclear plant design and operation, as gained from existing power plants in Canada and around the world. This review may take place in parallel with the Environmental Assessment and site preparation licensing process.

In addition to reviewing the information included in the application, the CNSC also verifies that any outstanding issues from the site preparation stage have been resolved. The CNSC staff's conclusions and recommendations from these reviews are documented in reports submitted to the Commission; the Commission then makes the final decision on the issuance of the construction licence. As noted earlier, the Commission will not issue a licence unless it is satisfied that the applicant will make adequate provisions to protect health, safety, security and the environment, and to respect the international obligations to which Canada has agreed. As such, it is the responsibility of the applicant to show that there are no major safety issues outstanding at the time the Commission considers the application for a construction licence.

During the construction phase, the CNSC carries out compliance activities to verify that the licensee is complying with the NSCA, associated regulations and its licence. Such compliance activities focus on confirming that plant construction is consistent with the design, the licensee is demonstrating adequate project oversight and confirming that quality assurance requirements are being met.

For the latter part of construction, regulatory attention turns towards the inactive commissioning program (without fuel loaded) and associated activities, whose purpose is to demonstrate, to the extent practicable, that all the systems, structures and components function reliably.

4.2.3 Operation

When applying for a *Licence to Operate* a nuclear power plant, it is the responsibility of the applicant to demonstrate to the CNSC that it has established the safety management systems, plans and programs that are appropriate to ensure safe and secure operation. Information required in support of the application for a licence to operate includes, for example:

- a description of the structures, systems and equipment at the nuclear power plant, including their design and operating conditions;
- the Final Safety Analysis Report; and
- 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, resulting from the operation and subsequent decommissioning of the plant;
 - assisting off-site authorities in emergency preparedness activities, including assistance to deal with an accidental off-site release; and
 - nuclear security.

A more complete listing of the specific information required to obtain a licence to operate a nuclear power plant is found in Section 6 of the *Class I Nuclear Facilities Regulations* (available at <http://www.nuclearsafety.gc.ca>).

In addition to assessing the information included in the application to operate the nuclear power plant, the CNSC also verifies that any outstanding issues from the construction licensing stage have been resolved.

The CNSC staff's conclusions and recommendations from these reviews are documented in reports submitted to the Commission, which then makes the final decision on the issuance of the operating licence.

The *Licence to Operate* will enable the operator to begin active commissioning. The purpose of the commissioning activities is to demonstrate that the plant has been constructed in accordance with the design, and that the systems, structures and components important to safety are functioning reliably. The initial operating licence is typically issued with conditions (hold points) to load nuclear fuel, permit reactor start-up, and operation at power in steps up to the design rating of the plant. All the relevant commissioning tests must be satisfactorily completed before the hold points can be relinquished.

During the subsequent long-term operation of the plant, the CNSC carries out compliance activities in order to verify that the licensee is complying with the NSCA, associated regulations and its licence terms. If the compliance activities identify any non-compliance or adverse trend, there is a range of possible actions that the CNSC can take, from a request for licensee action to prosecutions.

4.2.4 Decommissioning

As noted above, the information on decommissioning plans and financial guarantees will, in practice, be taken into account at all stages of licensing (site preparation, construction and operation). At the end of a nuclear power plant's useful life, it will be necessary to decommission the facility. This will require a separate licence from the Commission. Factors taken into account when evaluating an application to decommission a nuclear power plant include, but are not limited to:

- the major components and systems within the facility, which must be properly considered during decommissioning planning;
- the design features that will facilitate the decommissioning activities and reduce the spread of contamination during operation;
- the expected levels of activation and contamination within the facility, following the end of operation;
- an assessment of structures, to ensure that they are capable of being maintained for the proposed period of storage and monitoring;
- the disposal of some of the nuclear materials and radiation devices (e.g., fresh fuel, spent fuel, heavy water and/or water contaminated with tritium, and other prescribed nuclear materials); and
- the quantities, or volumes, of wastes of all types (radioactive and hazardous) expected during the decommissioning activities.

A listing of the specific information to be provided in support of an application to obtain a licence to decommission a nuclear power plant is found in Section 7 of the *Class I Nuclear Facilities Regulations* (available at <http://www.nuclearsafety.gc.ca>).

In addition, the licensees must show that they have sufficient funds to decommission the plant, provide for the long-term management of spent nuclear fuel, and provide continuing environmental monitoring and maintenance of the site, for the duration of the licence.

5. TIMEFRAME FOR LICENSING NEW NUCLEAR POWER PLANTS IN CANADA

The regulatory process for new power plant licensing, from receipt of the initial application to commercial operation, can be divided into three phases:

- EA and *Licence to Prepare Site*;
- *Licence to Construct*; and
- *Licence to Operate*.

The NSCA does not have provisions for combined licences for site preparation, construction, or operation. Separate licences must, therefore, be granted for each phase, and would be issued in sequence. However, applications to prepare a site, to construct and to operate a new nuclear power plant could be assessed in parallel.

As a regulatory agency, the CNSC must satisfy itself that the Crown's duty to consult and, if appropriate, accommodate, has been met towards Aboriginal communities whose rights may be impacted. Activities related to Aboriginal consultation take place throughout the life-cycle of the project, including pre-submission licensing phase, the Environmental Assessment phase, the licensing phase and once operation of the nuclear power plant begins.

In the context of a Joint Review Panel process (see sections 4.1 and 4.2.1.1), Figure 3 (see end of document) shows the process map for licensing a new nuclear power plant, including the EA, the work carried out by the CNSC to assess applications, key decision points in the process and activities performed by the applicant. As shown in Figure 3 and in Table 1, the CNSC estimates that the total time from the receipt of application to the issuance of a licence to operate is approximately nine years — taking into consideration that a number of activities may proceed in parallel.

Table 1 outlines the estimated durations of the EA and Licensing phases, and includes approximate time for applicant's activities, such as preparation of the site and construction of the facility. The applicant's activities occur in parallel with regulatory activities.

The time estimates in Table 1:

- assumes that the CNSC will receive complete and comprehensive applications;
- includes the time needed for resolution of comments on submissions; and
- includes the time required for the 2-day licence hearing process, which amounts to six months.

Table 1: Approximate Duration of the Environmental Assessment and Licensing Steps

Activity	Duration
Aboriginal Consultation	ongoing
Environmental Assessment and Licence to Prepare Site (<i>includes development of Joint Review Panel Agreement and EIS Guidelines</i>)	~36 months
Applicant prepares site	~18 months
Licence to Construct – at least 6 months overlap with the previous activities	~30 months
Licence to Operate	~24 months
Applicant’s activities, e.g. plant construction	~48-54 months
Total duration from the application for the Licence to Prepare Site to Licence to Operate, taking into account overlapping environmental assessment/licensing and applicant’s activities, which may run in parallel	~9 years

Some of the following factors may also influence the duration of the licensing process:

- the EA process could take up to 36 months, depending on whether the EA is carried out as a comprehensive study or by a panel, and depending on the amount of time required by the licence applicant to prepare the necessary documentation (e.g. EIS, providing additional information requirements). This represents an estimate, based on past experience;
- the information required to accompany the application should be submitted in a comprehensive and complete package, so that the assessment of the application can be carried out in an effective, efficient and timely manner;
- the time required for the applicant to carry out its activities (i.e. prepare the site, construct and commission the nuclear power plant and train and certify plant personnel);
- whether there are any major safety issues that require resolution before CNSC staff can prepare their recommendations to the Commission; and
- whether the CNSC has the resources to carry out its review in a timely manner.

6. PUBLIC INVOLVEMENT IN THE LICENSING PROCESS

The CNSC is committed to operating with a high level of transparency. This includes engaging stakeholders through a variety of appropriate consultation processes, effective information sharing, and communications.

An EA for a new nuclear power plant, conducted either at the comprehensive study or panel review level, provides significant opportunities for public participation. If a decision is made to refer the project’s environmental assessment to a review by panel, these opportunities include commenting on draft Environmental Impact Statement (EIS) Guidelines and the Joint Review Panel Agreement, commenting on the EIS and participating in public hearings. Dedicated funds

are provided and administered by the Canadian Environmental Assessment Agency, to assist participants in preparing for and participating in the EA process.

In the case when a project undergoes a Joint Review Panel process (see sections 4.1 and 4.2.1.1), public participation is especially encouraged, because this approach involves decisions by a single body— a Joint Review Panel — about a project’s environmental assessment and licence to prepare a site.

The consideration of licence applications for new nuclear power plants by the Commission follows the public hearing process, as set out in the *CNSC Rules of Procedure*, which are available on the CNSC’s Web site at www.nuclearsafety.gc.ca. Typically, public hearings for licensing applications for nuclear power plants take place over two hearing days — held over a ninety-day period. Public hearings give affected parties and members of the public an opportunity to be heard before the Commission. The timelines for both one-day and two-day hearings, based on the *CNSC Rules of Procedure*, are shown in Figure 4 (see end of document).

Following the second day of the hearing, the Commission members will deliberate and render a Record of Proceedings, including Reasons for Decision. Typically, the Record of Proceedings and Reasons for Decision are published within six weeks after the close of the hearing.

In addition to the formal licensing process, the CNSC encourages licence applicants to undertake pre-application communications activities, such as public consultations, regarding their plans for new nuclear power plants. The CNSC has issued a regulatory guide (G-217: *Licensee Public Information Programs*), which provides general information to licensees on the regulatory requirements for public information programs.

Figure 1. Process for Obtaining a Licence to Construct or Operate a New Nuclear Power Plant in Canada

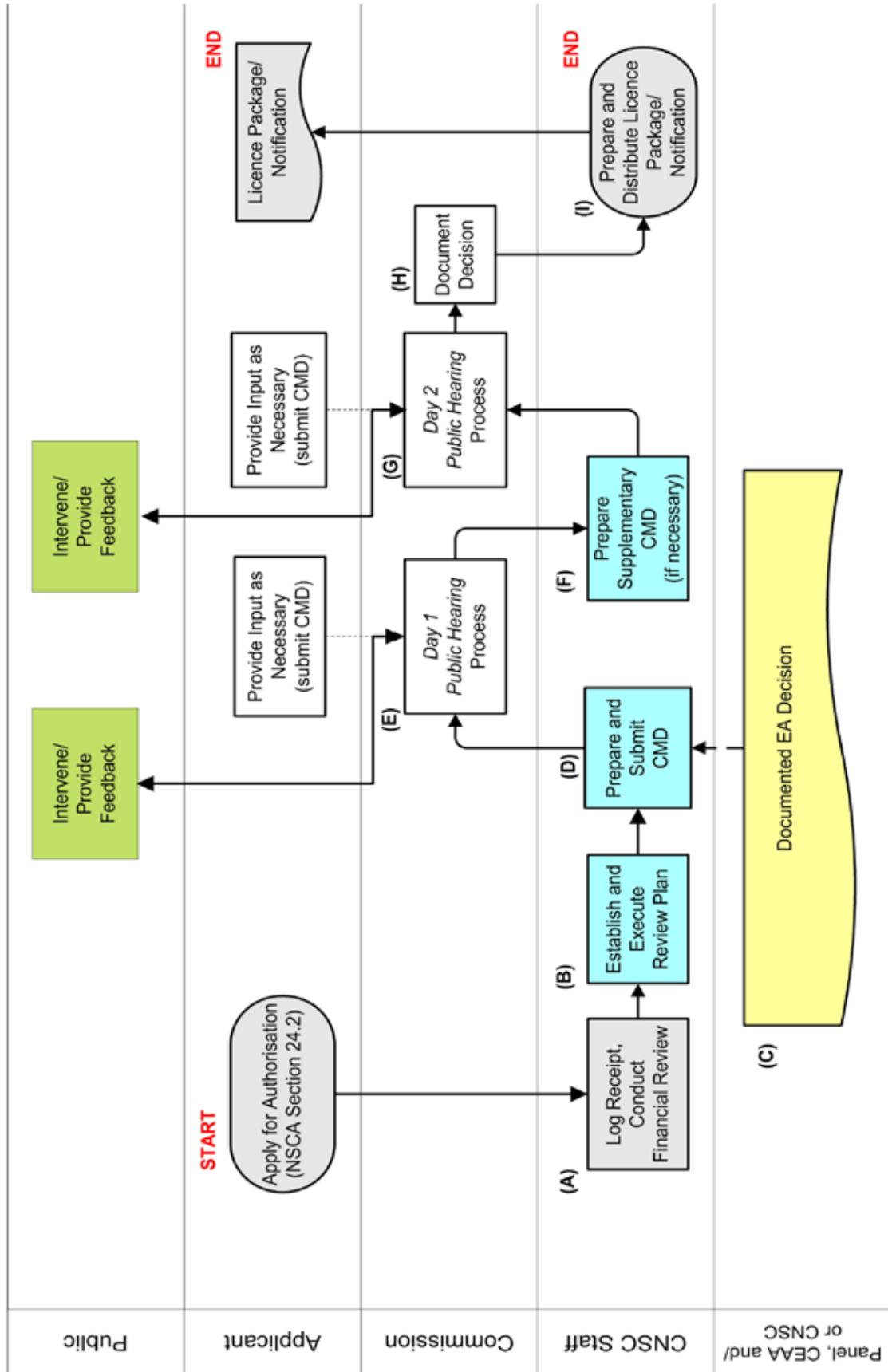


Figure 2. Joint Review Panel Process - Environmental Assessment (EA) and Licence to Prepare Site

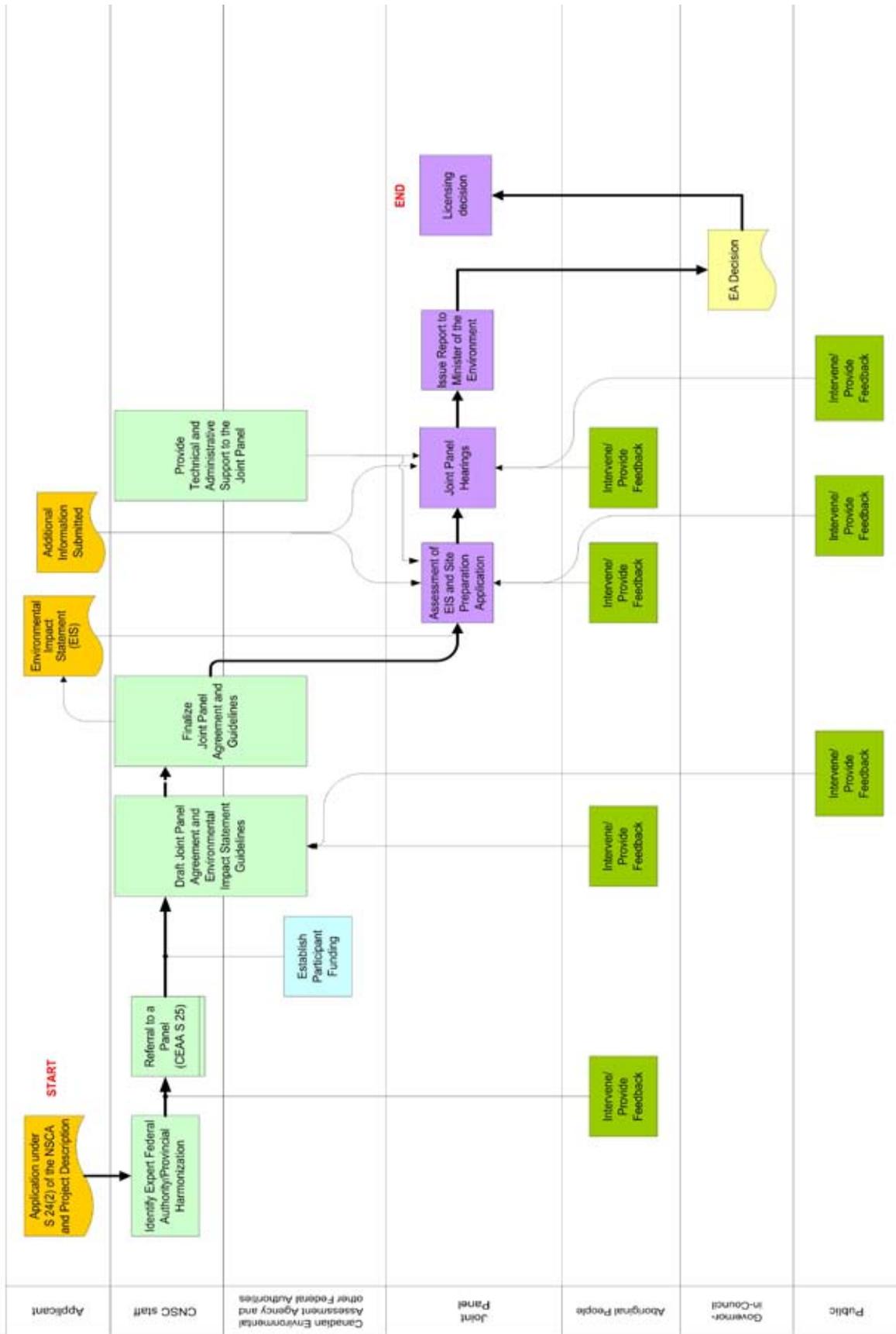


Figure 3. Environmental Assessment (EA) & Licensing Process for New Nuclear Power Plant

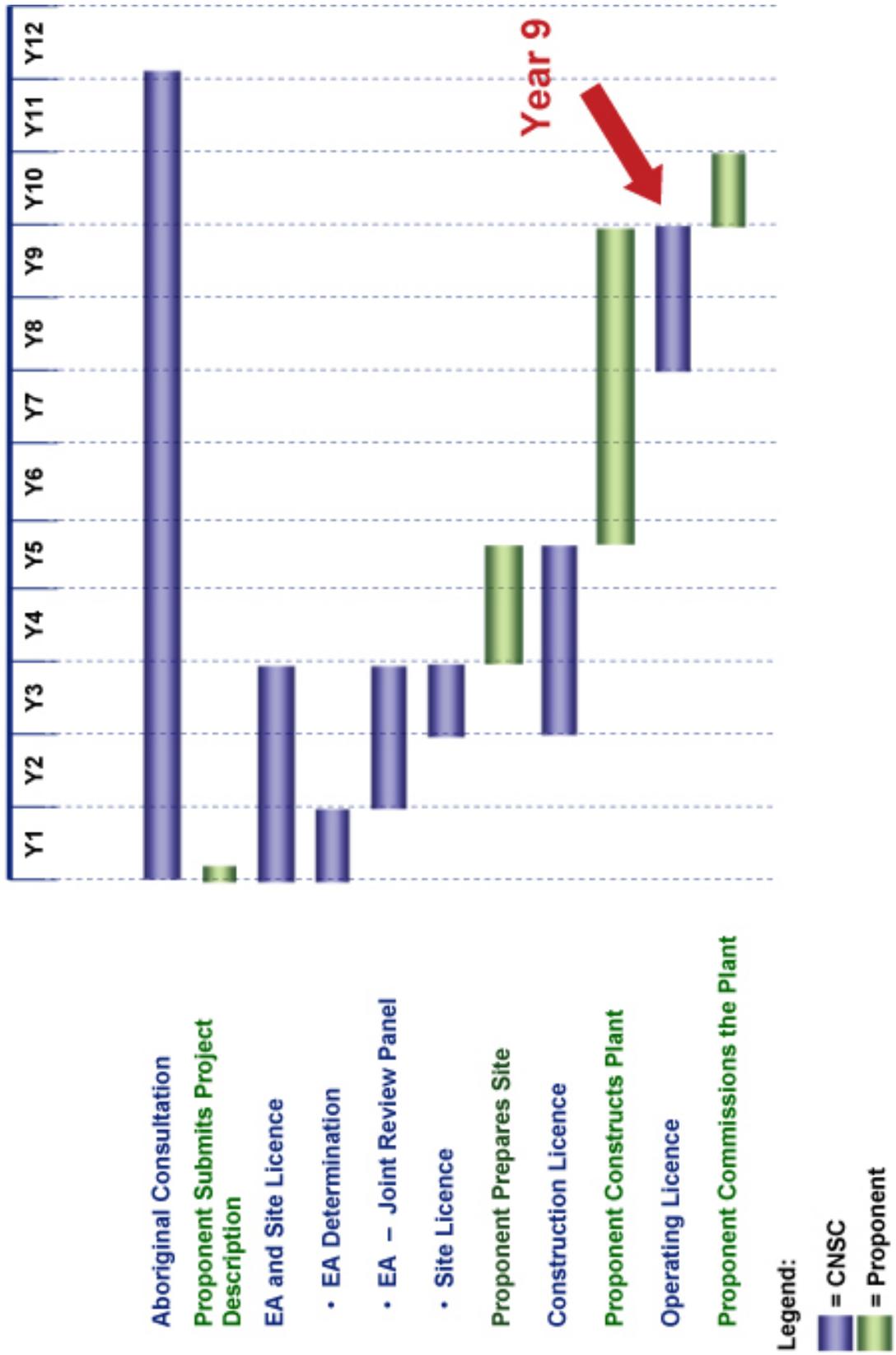
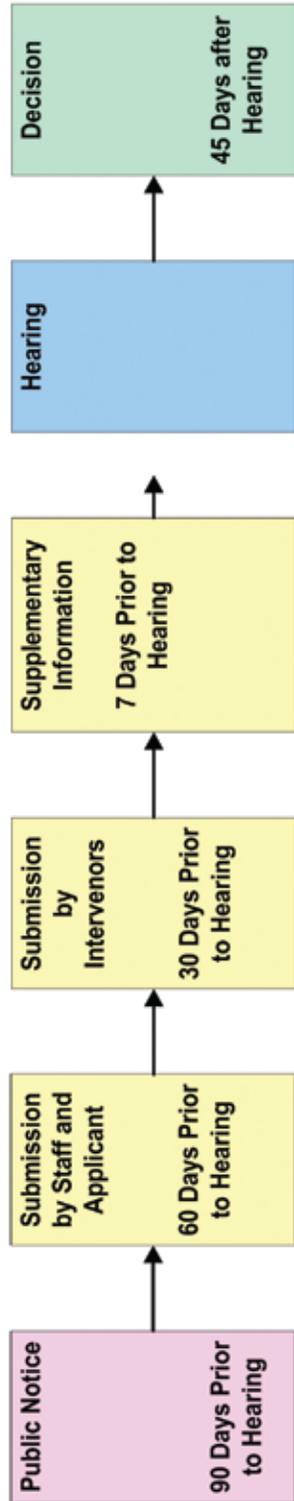


Figure 4. Timelines for one-day and two-day hearings.

One-Day Hearing (~ 5 Months):



Two-Day Hearing (~ 6 Months):

