



The Canadian Nuclear Regulatory Process and the Use of the Safety Case for Demonstrating the Long Term Safety of Radioactive Waste



**Safety Cases for the Deep Disposal of
Radioactive Waste: Where Do We Stand?**

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Outline



- **The CNSC and its Regulatory Philosophy**
- **Guidance on Radioactive Waste: LT Safety**
- **Licensing Process**
- **Information for licensing RWM Facilities**
- **Attributes of the safety case**
- **Concluding remarks**



Nuclear Safety and Control Act



- **Prohibits activities related to nuclear substances, prescribed equipment and prescribed information**

- **Creates CNSC and defines its authority, including:**
 - **to define classes of licences**
 - **to issue licences and enforce compliance**
 - **to make regulations****and responsibilities, including:**
 - **to hold public hearings**
 - **to provide an opportunity to be heard**



CNSC Mandate under the NSCA



- To regulate the development, production and use of nuclear energy and materials **to prevent unreasonable risk to Health & Safety, the Environment** and national security
- To regulate the production, possession and use of nuclear substances, prescribed equipment and prescribed information;
- To implement measures respecting international commitments on the peaceful use of nuclear energy and substances; and
- To **disseminate scientific, technical and regulatory information** concerning CNSC activities



Regulatory Philosophy



- Licensees are directly responsible for managing regulated activities
- CNSC is responsible to Canadians for assuring that licensees' responsibilities are properly discharged
- CNSC's non-prescriptive approach places the burden of demonstrating safety on the licensee



Guidance on Radioactive Waste



- P-290: Managing Radioactive Wastes**
- G-320: Assessing the Long Term Safety of Radioactive Waste Management**

Methodology

System description

- Site characterization / Baseline environment
- Design and operation of the facility

Safety Assessment

- Assessment Context
- FEPS
- Scenarios

Supporting analyses for confidence, credibility

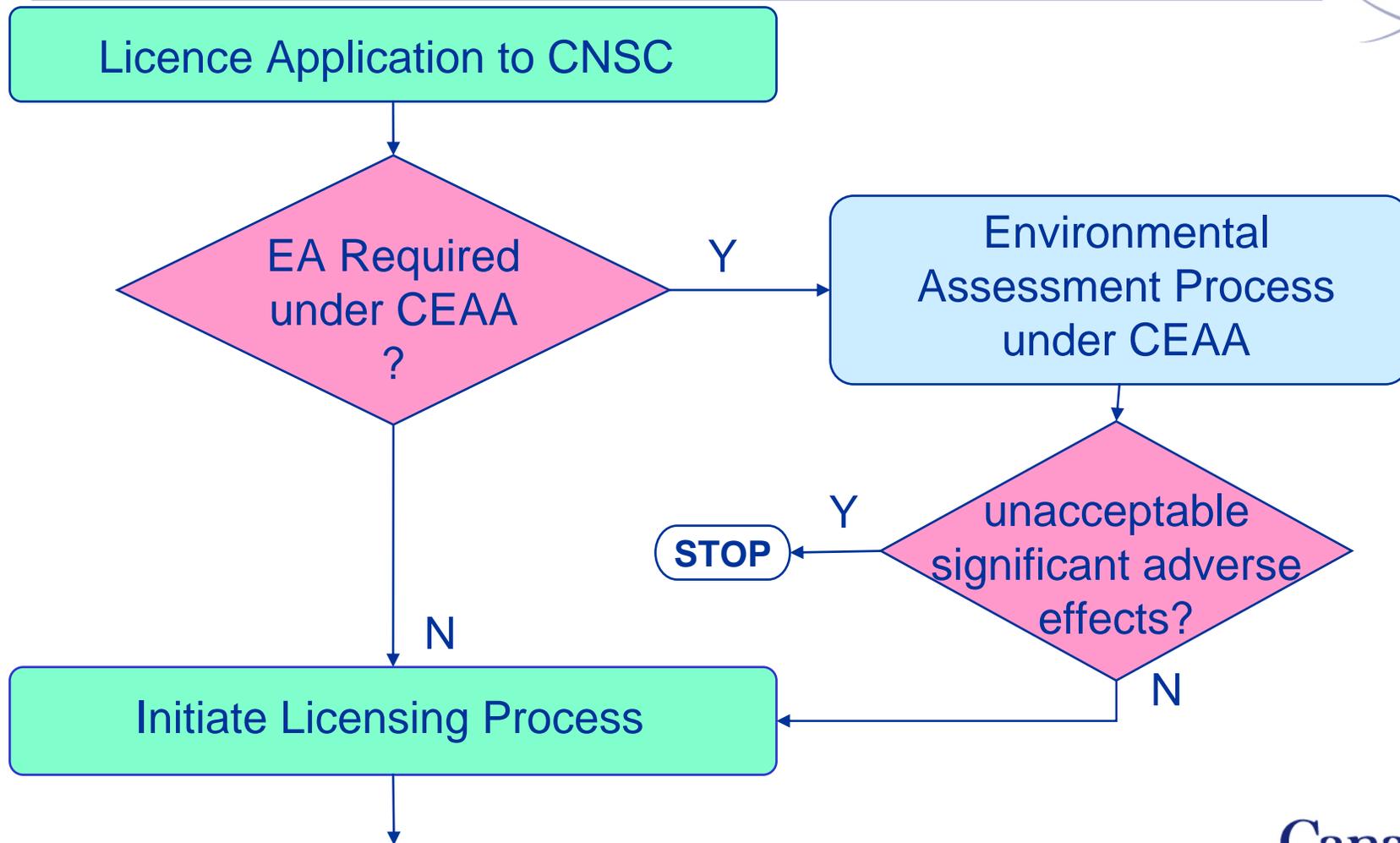
- Assumptions / limitation of model calculations
- Uncertainty analysis

Complementary arguments for confidence, credibility

- Bounding assessments / Limits
- Natural analogues

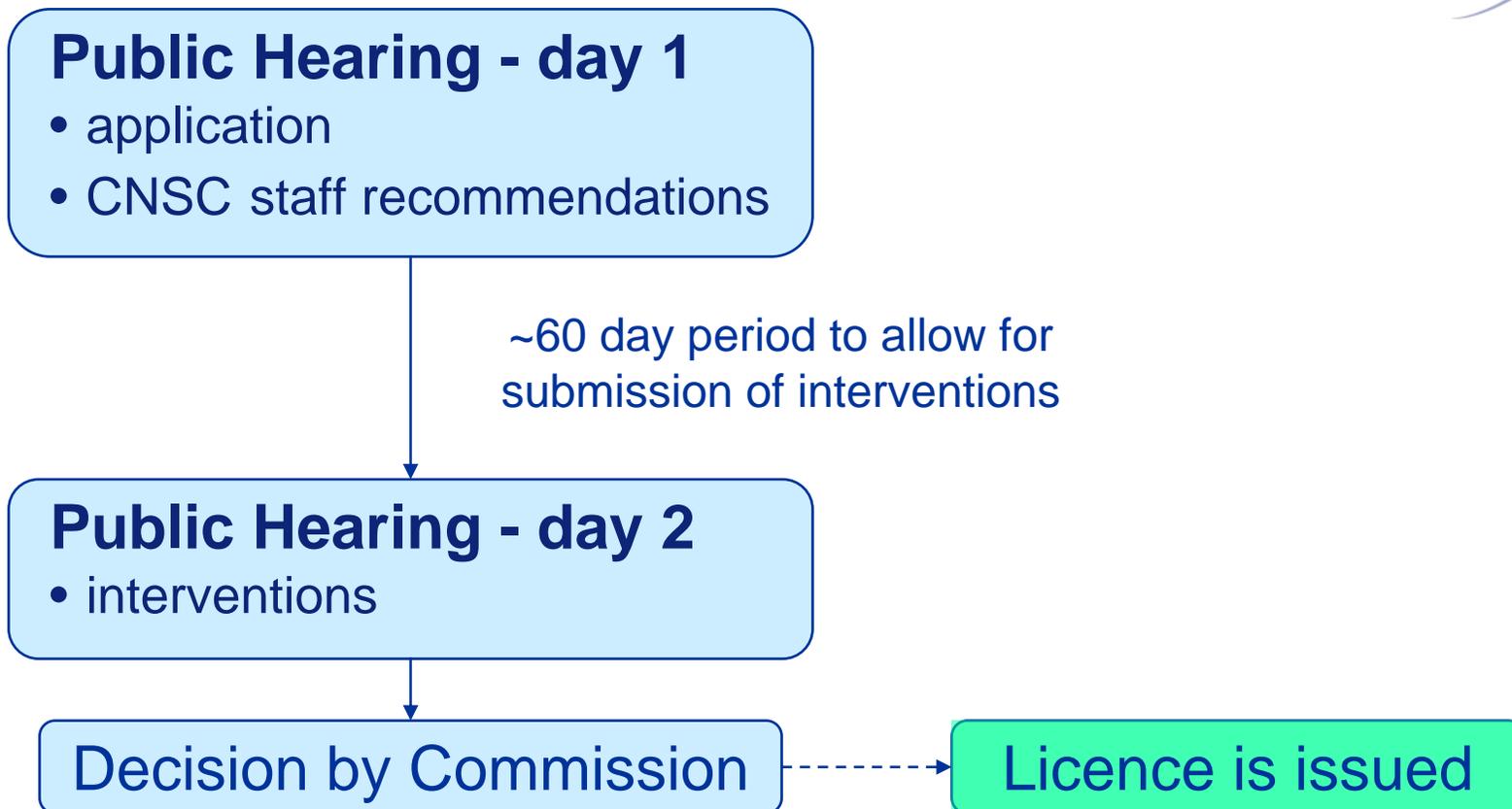


Pre-Licensing (CEAA)





Public Hearing Process





Key Information for CEAA Environmental Assessment

Elements of a Safety Case



-
- | | |
|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| • Description of the project | • System description |
| • Description of Baseline Environment | • Site characterization |
| • Evaluation of potential environmental effects | • Safety Assessment <ul style="list-style-type: none">– Assessment Context– FEPS– Scenarios |
| • Alternate means of implementing | • Complementary Arguments |
| • Follow-up program | • Assumptions and limitations of model calculations, Uncertainty Analysis |
| • Public and stakeholder consultation | • Confidence in the process, credibility of the proponent |



Key Information for a Licence Application

Elements of a Safety Case



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- Detailed description of the facility and its operation

- System description
 - Site characterization
 - Facility design

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- Safety Analysis Reports
 - Environmental Impacts associated with the current and subsequent stages

- Safety Assessment
- Supporting Analyses
- Complementary Arguments

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- Organizational structure, qualifications of the applicant

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- QA, RP, EM & security programs

- FEPS for operations scenarios

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- Public information program



Assessment of a Licence Application

Relation to a Safety Case



-
- No unreasonable risk from licensed activities
-
- Confidence in Safety Case
 - Methodology
 - Data
 - Results
 - Interpretation
-
- Applicant is qualified to carry out licensed activities (competence)
-
- Safety Case is comprehensive
 - FEPS & Scenarios
 - Clear presentation
 - Exclusions justified
-
- Applicant will make adequate provision to protect health, safety and security of persons and the environment (credibility)
-
- QA, RP, EM & EA follow-up programs clearly derived from FEPS & Scenarios, Safety Case interpretations



Attributes of the Safety Case



- ✓ Clear description of the system (facility, site and environment)
- ✓ Sufficiently comprehensive evaluation of long term safety
- ✓ Confidence building arguments (multiple lines of reasoning)
- ✓ Uncertainties identified for follow-up, resolution
- ✓ Stakeholder Consultation assisted by clarity and completeness
- ✓ Demonstrates applicant's qualifications and competence
- ✓ Basis for commitment to adequate provisions for safety



Closing Remarks



Licensing decisions are informed by diverse information

Much of this information is consistent with that in a Safety Case.

The Safety Case can provide

- a useful framework for managing information
- enhanced credibility of safety-related arguments
- a disciplined approach to communicating clearly
- a structure by which regulators can communicate their expectations and guide their reviews