Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Canadian Nuclear Safety Commission (CNSC) Early Role in the Adaptive Phase Management Project

CNSC Presenters:

- **Julie Mecke, Senior Project Officer, Wastes and Decommissioning Division**
- **Julie Brown, Geoscience Assessment Officer, Environmental Risk Assessment Division**

Hornepayne Community Liaison Committee
Hornepayne, ON
March 26, 2013

CNSC CCSN

Scope of presentation

- CNSC is independent regulator
- No licence application, early in the process
- We do not promote the APM program and nuclear energy
- CNSC role is to ensure safety

Outline

1. Overview of the CNSC 's independent regulatory role and current licensing process
2. Regulatory approach for radioactive waste management
3. Current (interim) management of used nuclear fuel
4. CNSC early involvement in the APM project
5. Ongoing independent research and international collaboration
6. CNSC's role in regulating the transportation of nuclear substances
7. Concluding comments

Canadian Nuclear Safety Commission

- Canada's nuclear regulator
  - Reports to Parliament through Minister of Natural Resources

Regulates the use of nuclear energy and materials to:

- protect the health, safety and security of Canadians and the environment;
- implement Canada's international commitments on the peaceful use of nuclear energy; and
- disseminate objective information

Regulatory Philosophy

Licensees responsible for the protection of health, safety, security, and the environment and respecting Canada's international commitments

CNSC responsible for regulating licensees, assessing whether licensees are compliant with the NSCA, regulations, and international obligations

A regulator with 67 years of experience

CNSC Regulates Facilities and Activities

- Nuclear power plants
- Uranium mines and mills
- Uranium fuel fabricators and processing
- Nuclear substance processing
- Industrial and medical applications of nuclear substances, such as nuclear medicine and cancer treatment centers
- Research labs and educational facilities
- Export/import of controlled nuclear substances, equipment and technology
- Waste management facilities

…from cradle to grave

CNSC - Independent Commission Tribunal

- Commission members are independent
- Commission hearings are public and Webcast



Transparent decision-making

CNSC - Staff

Scientific, technical and other professional staff, responsible for:

- implementing the decisions of the Commission
- verifying compliance with licences and regulations
- reviewing licence applications and performing EA review work
- developing regulatory guidance
- advising on regulatory policy and options
- engaging citizens and communities through outreach

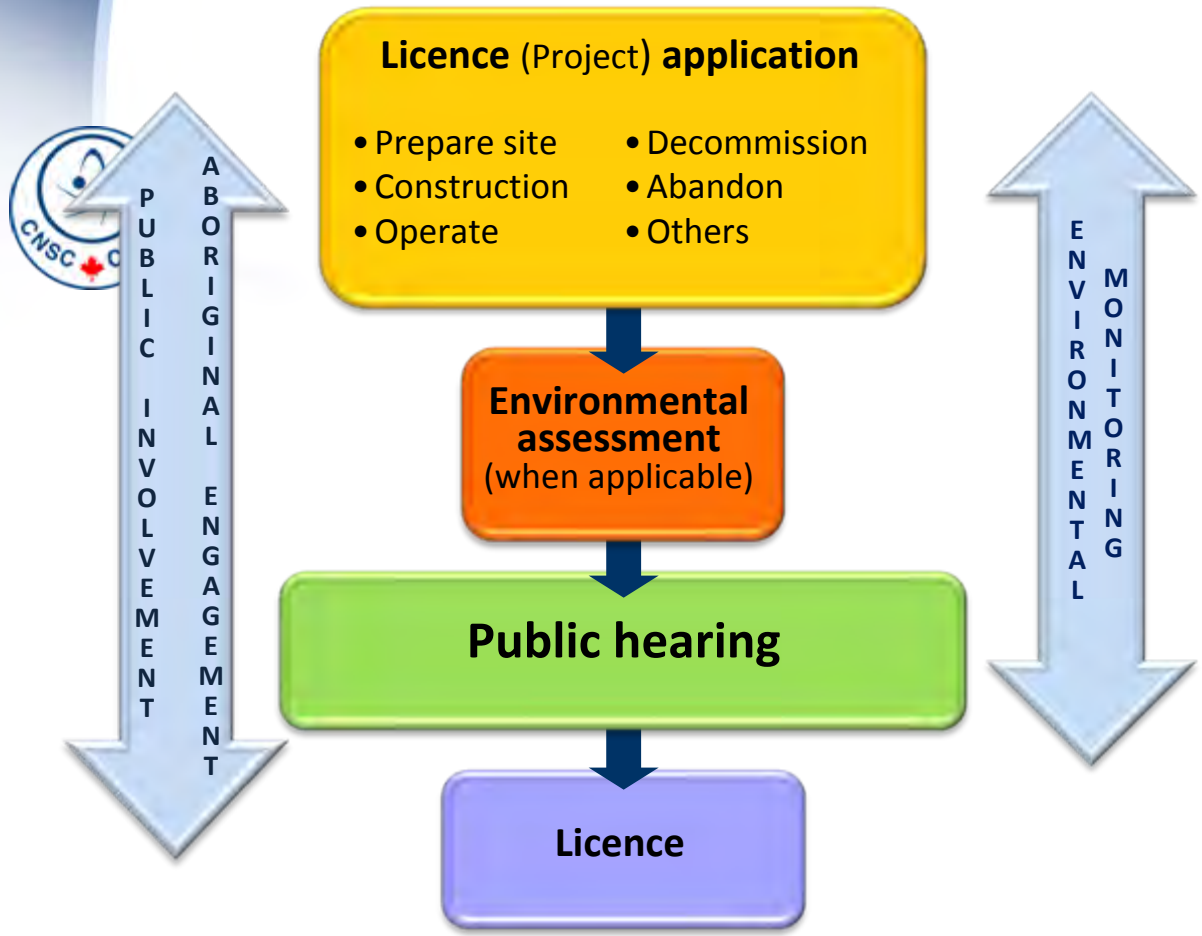
Stages of Licensing for Class I Facilities

0	1	2	3	4	5
Pre-project (no licence)	Site preparation	Site Construction	Site operation	Decommissioning (Closure and Post Closure)	Release from licensing (Abandonment)

Financial guarantees are required at stages 1 through 4

Staged approach / Early planning

CNSC Licensing Process for Phased Licensing



CNSC oversight

- Licence conditions
- Inspections
- Compliance assurance

Licensee obligations

- Health and safety
- Environmental protection
- Security
- Monitoring
- Reporting
- Financial guarantee

Commission Public Hearing

- Commission members are independent
- Commission hearings are public and Webcast
- The Commission Tribunal holds public hearings on licensing matters for major nuclear facilities
  - Give affected parties and members of the public an opportunity to be heard before the Commission Tribunal
  - Hearings may be held in communities

…provide input into the licensing process

Public Involvement in the Process

Harmonization with Provincial/Federal Agencies

- CNSC utilizes a harmonized or joint review approach with other federal, provincial or territorial departments in such areas as health, environment, transport and labour.
- The CNSC would expect nuclear facilities to comply with all applicable federal and provincial regulations.
- Joint Regulatory Review Process
- Federal and provincial agencies are considered in the regulatory process and are reflected, as appropriate, in the licence in the form of site-specific requirements.

Compliance Program

Verification

Clarity

Enforcement

2) Regulatory Approach for Radioactive Waste

- Approach stems from the *Nuclear Safety and Control Act* (NSCA), and CNSC regulatory policy document ***P-290, Managing Radioactive Waste***
- Three principles:
  - Plan for the complete life of the facility
  - Multi-barriers between radioactive material and people/the environment
  - Defence in depth – never rely on a single system or process for protection

Canada's Radioactive Waste Classification

1) High-level radioactive waste (HLW)
2) Intermediate-level radioactive waste (ILW)
3) Low-level radioactive waste (LLW)
   - o low-level short-lived radioactive waste (VSLLW)
   - o very-low-level radioactive waste (VLLW)
4) Uranium mine and mill tailings

HLW

ILW

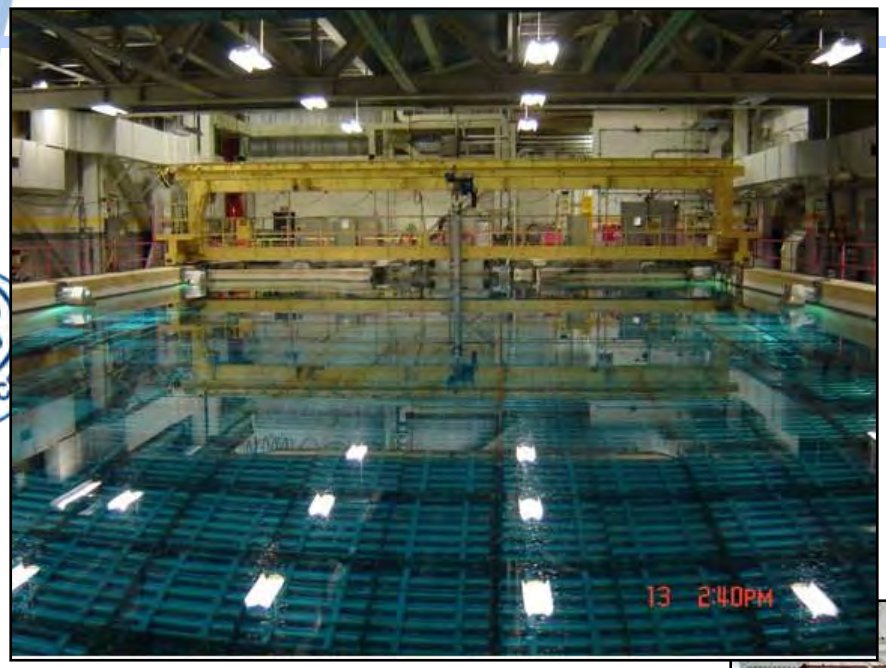
LLW

Uranium mine & mill tailings

3) How Used Nuclear Fuel is Currently Managed (interim storage)

- Each reactor site has wet storage pools for used nuclear fuel storage (15 to 20 yrs of operation)
- After a period in wet storage (7 to 10 yrs), used nuclear fuel can be transferred to dry storage
- Each reactor site has facilities for the safe, dry storage of used nuclear fuel
- Dry storage facilities:
  - are monitored and have no impact on the public and the environment
  - meet requirements for national security and international agreements

Interim Management of Used Nuclear Fuel (cont'd)



Used nuclear fuel in wet storage within reactor bays

Dry storage containers holding used nuclear fuel

4) CNSC Involved Early in the APM Process (Pre-project)

Objectives

- Build independent knowledge
- Start a dialogue with future applicant
- Communicate the CNSC's role and responsibilities as Canada's nuclear regulator
- Clarify CNSC regulatory expectations and requirements
- Focus on key safety aspects
- Maximize national and international collaboration
- Review key research publications from future applicants

CNSC/NWMO APM Working Arrangement (Pre-project)

- Early CNSC participation in siting process, prior to submission of a licence application
  - Information to interested communities
  - Public meetings to provide information on the nuclear regulator's role
  - Identifying regulatory requirements for a geological repository
  - Pre-project design reviews of APM deep geological repository concepts (crystalline and sedimentary)

Pre-project Communication Activities

Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

Canada

Canadian Nuclear Safety Commission

nuclearsafety.gc.ca

Français | Home | Contact Us | Help | Search | canada.gc.ca

Home > About CNSC > Regulated Facilities and Activities > Managing Canada's Radioactive Waste > What About Future Long-Term Waste Management?

About CNSC

- Our Mission
- History
- Organization
- Values and Ethics at the CNSC
- International
- **Regulated Facilities and Activities**
  - Nuclear Power Plants
  - Heavy Water Production Plants
  - Uranium Mines and Mills in Canada

What About Future Long-Term Waste Management?

The Canadian nuclear industry and the Government of Canada are developing several long-term radioactive waste management solutions. The following are some of these initiatives.

Nuclear Waste Management Organization (NWMO)

The NWMO was established in 2002 by Ontario Power Generation Inc., Hydro-Québec and New Brunswick Power Corporation in accordance with the *Nuclear Fuel Waste Act* to assume responsibility for the long-term management of Canada's used nuclear fuel. The NWMO has the mandate to implement Adaptive Phased Management (APM), a process to find a solution for the long-term storage of used nuclear fuel that is socially acceptable, technically sound, environmentally responsible and economically feasible to Canadians.

In May 2010, as part of the APM approach, the NWMO launched its Site Selection Process to select a willing community to host a geological repository for the long-term management of Canada's used nuclear fuel.

Pre-project Technical Activities

- Long-term safety must be considered at the very beginning of repository planning
  - Geosphere Attributes
  - Repository Attributes
- Pre-licensing review of Safety Case key elements
  - Pre-project design reviews of APM deep geological repository concepts (crystalline and sedimentary)
- Conduct independent research
  - Natural tracers, glaciation, gas migration, excavation disturbed zones (EDZ).

5) Continuing Independent Research and International Collaboration

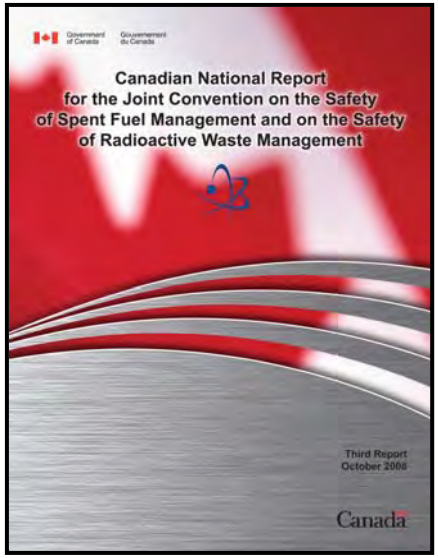
- Since 1978, CNSC involved in independent research and assessment, including international collaboration, on the safe long-term management of used nuclear fuel in geological repositories
- CNSC expanding this expertise to sedimentary rocks
  - Coordinated Assessment and Research Program (CARP)
- International Collaboration
  - France - long term performance of shaft seals (SEALEX)
  - European Union - regulatory expectations, foster common understanding of technical key points for safety (SITEX)

Sustainable network for Independent TECHNICAL EXPERTISE SITEx for Radioactive Waste Disposal

National and International Perspectives

- International Atomic Energy Agency (IAEA)
  - Radioactive Waste Management Committee
  - Transport Safety Standards Advisory Committee
  - Radiation Safety Standards Committee
- Nuclear Energy Agency (NEA)
  - Radioactive Waste Management Committee
- Canadian Standards Association (CSA) (national)
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

IAEA



International Perspectives (cont.)

Waste Isolation Pilot Plant (WIPP), New Mexico

Photo 1: Designated Transportation Routes to the WIPP Facility
Source: US DOE visitor centre

Photo 2: Room 6, plugged horizontal borehole for Remote Handled Waste

US EPA www.epa.gov/rpdweb00/wipp
US DOE www.wipp.energy.gov/

6) CNSC's role in Regulating the Transportation of Used Nuclear Fuel

Transport Safety = Package Design

Responsibility

- The transport of nuclear substances (this includes used nuclear fuel) is regulated by:
  - Canadian Nuclear Safety Commission
  - Transport Canada
- Regulated the same as nuclear substances, except for used nuclear fuel a transportation security plan is also required.

26

Consignors/shipper - Responsibilities

- The consignor is responsible for:
  - Selecting the proper package type
  - Preparing the package for shipment
  - Displaying proper safety marks on packages
  - Preparing the shipping documents
  - Implementing an Emergency Response Plan
  - Providing additional information to carriers, when applicable
  - Reporting Incident
  - Ensuring that workers have received Radiation Protection and TDG training
  - Maintaining records
- In order to transport used nuclear fuel in Canada a transportation security plan is also required

Emergency Response

- Regulations require consignors to provide a 24 hour number on shipping documents
- Consignor must be able to provide information about the goods being transported to first responders
  - First responders are typically local firefighters and police officers
- Consignor is responsible to respond to transport accident to ensure adequate clean-up

Emergency Response (2)

- CNSC Duty officers provide guidance to first responders and to persons involved in the remediation of an accident involving Class 7

- CNSC Transport Specialists can provide assistance to the duty officer and first responders

Concluding Comments

- Canada's independent nuclear regulator
- CNSC responsibilities include the licensing, compliance and enforcement of the radioactive waste management facilities in Canada
- Protection of workers, the public and the environment is top priority
- Transparency and, aboriginal and public consultation are strongly valued
- There is a harmonized approach to relations with other government departments

Concluding Comments (cont.)

- No licence application is expected in the next few years
- CNSC is involved early in the process as this is an international best practice.
- The CNSC uses a comprehensive licensing process that covers the entire lifecycle of a geological repository
- Transportation to repository site will be included in the licensing process

Additional Resources

- CNSC fact sheet on Regulating Canada's Geological Repositories:
  http://www.nuclearsafety.gc.ca/eng/about/regulated/radioactivewaste/regulating-canadas-geological-repositories-fact-sheet.cfm

CNSC website for the APM project:
http://www.nuclearsafety.gc.ca/eng/about/regulated/radioactivewaste/cnsc-role-in-nwmo-apm-project.cfm

- Transportation of Nuclear Substances fact sheet:
  http://www.nuclearsafety.gc.ca/eng/readingroom/factsheets/packaging-and-transport-of-nuclear-substances.cfm

- Nuclear Security Regulations;
  http://laws.justice.gc.ca/en/n-28.3/sor-2000-209/153978.html

- CNSC Regulatory Guide G-208, *Transportation Security Plans for Category I, II or III Nuclear Material:*
  http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/G208_e.pdf

We Will Not Compromise Safety

nuclearsafety.gc.ca