The regulator’s role in the safe disposal of low-level and intermediate-level radioactive waste

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Presentation Outline

• Introduction to the Canadian Nuclear Safety Commission (CNSC)
• CNSC licensing process and regulatory framework
• Canada’s radioactive waste classification
• Initiative for a deep geologic repository for low- and intermediate-level waste (L&ILW)
  – public hearing process
  – Crown consultation
  – lessons learned and path forward for CNSC staff
• Conclusions
Canadian Nuclear Safety Commission (CNSC)

- Canada’s independent nuclear regulator
- Regulates the use of nuclear energy and materials to:
  - protect the health, safety and security of persons and the environment
  - implement Canada’s international commitments on the peaceful use of nuclear energy
  - disseminate objective scientific, technical and regulatory information to the public

Regulatory philosophy

Licensees: responsible for the protection of health, safety, security and the environment and for implementing Canada’s international commitments

CNSC: responsible for regulating licensees, assessing whether licensees are compliant with the Nuclear Safety and Control Act, regulations and international obligations

A regulator with 69 (updated) years of experience
CNSC Regulates Facilities and Activities

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

...from cradle to grave
CNSC Licensing Requirements

- Legal basis for licensing:
  - Nuclear Safety and Control Act (NSCA)
- Application requirements:
  - NSCA
  - CNSC regulations
  - regulatory documents
  - guidance documents

- CNSC licences:
  - 14 safety and control areas (SCAs) grouped in functional areas: management, facility and equipment, core control processes

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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

- CSA Group (formerly called Canadian Standards Association (CSA)) – national

CNSC Licensing Process

License (Project) Application
- Prepare site
- Construction
- Operate
- Decommission
- Abandon
- Others

Environmental Assessment

Public Hearing

Licence

CNSC oversight
- Licence conditions
- Inspections
- Compliance assurance

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

* Open and transparent public involvement at all stages

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Stages of Licensing for Class I Facilities

Financial guarantees are required at stages 1 through 4

Staged approach / early planning
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 (unique to Canada)
Managing historic LLW: the Port Hope Area Initiative

Aerial View of Port Hope, Ontario
Historic LLW and the Port Hope Area Initiative (cont’d)

- **Phase I:** Possession and management of the nuclear substances at the Welcome WMF
- **Phase II:** Construction of the Long-Term Low-Level Radioactive Waste Facility (LTWMF)
  - integration of the waste from the Welcome WMF
  - cleanup and remediation of offsite historic waste within the Municipality of Port Hope and transfer to the new LTWMF
- **Phase III:** The post-closure phase, involving long-term monitoring and maintenance of the LTWMF.
Managing L&ILW: Ontario Power Generation’s Deep Geologic Repository (DGR)

- Long-term management of OPG low- and intermediate-level radioactive waste
- Volume: 200,000 cubic metres of emplaced waste
- **Not** for used nuclear fuel
- Proposed project location: Tiverton (Municipality of Kincardine), Ontario
Waste generation

• Low- and intermediate-level waste (L&ILW) is generated by various processes and activities at the nuclear power plants

• Waste generators are responsible for understanding and characterizing their wastes at all stages (production, processing, transfer, transport, storage and disposal)

• L&ILW is segregated and characterized at source as part of a waste management program

Waste characteristics / characterization requirements

• Reflective of the materials, processes and activities producing it

• Includes the physical, radiological, chemical and biological properties

• Characterization commensurate with hazards and stage of management
OPG-Proposed Location for DGR

Location for DGR, Bruce site – courtesy OPG
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Joint Review Panel (JRP) Process for OPG’s DGR

1. JRP public review period for environmental assessment (EA) and licence to prepare site and construct (LPSC) application

2. JRP public hearing for EA and LPSC followed by development of EA panel report

3. EA panel report submitted to federal Minister of Environment

4. EA decision made by federal Minister of Environment

5. JRP decision on LPSC application
JRP Process for OPG’s DGR

- 3-person panel appointed to conduct the environmental assessment and consider the licence application under the NSCA
- DGR Joint Review Panel hearings
  - September 16–29 and October 28–30, 2013
  - September 9–18, 2014
  - held in Kincardine and Port Elgin, ON
- Hearings were webcast
- 200 public interventions
- CNSC staff made 18 presentations
- No regulatory decisions have been made to date
- Panel report will be submitted by May 6, 2015

The panel submits a report to the federal Minister of Environment who makes the final decision on the EA.
CNSC Staff Role in JRP Process

- Review and assess OPG’s Environmental Impact Statement (EIS) submissions against EIS Guidelines
- Review and assess OPG’s licence application submissions against NSCA and CNSC regulations
- Propose information requests to the JRP
- Assess sufficiency of responses to information requests
- Provide technical and scientific support to the JRP
- Act as Aboriginal Crown Consultation Coordinator
- Act as Federal Review Team Coordinator
CNSC Staff Assessment of OPG’s Environmental Impact Statement

- CNSC staff proposed 21 recommendations for the consideration of the JRP in the areas of:
  - project lifecycle
  - radioactive waste inventory
  - geology
  - hydrology and surface water
  - atmospheric environment
  - human health
  - socio-economic environment
  - long-term safety of the DGR Project
Public and NGO engagement

- CNSC is proactive and approaches local communities
  - Example: “CNSC 101”
- Participant funding program
- Website provides information
The CNSC, as the Crown Consultation Coordinator, has engaged and consulted with Aboriginal groups since May 2006 for the DGR Project

- met with Aboriginal groups to explain process and opportunities to participate as well as listen to their concerns
- encouraged Aboriginal groups to identify the project’s possible impacts on potential or established Aboriginal or treaty rights, share their traditional knowledge, and participate in public hearings
- provided updates via letters, emails and phone calls at key points in the process
- reviewed submissions to assess potential impacts
1. Methodology used to determine significance of adverse environmental effects
2. Updates to Geoscientific Verification Plan
3. Potential DGR expansion plans (for decommissioning waste)
4. Alternative options risk analysis
5. Waste inventory plan
6. Recent incidents at the Waste Isolation Pilot Plant (WIPP) in New Mexico
Proposed CNSC Licence

- Licence to prepare site and construct (LPSC) does not allow for possession of nuclear substances
- 10-year licensing period proposed for completion of design details and site preparation and construction activities
- CNSC inspectors to conduct independent safety checks, environmental monitoring
- Inspectors have enforcement tools if necessary
- Operating licence is required before waste packages can be placed in the completed repository. A public hearing will take place and the public will be given the opportunity to provide comments.
Lessons Learned

- Early involvement is important to the development of acceptable EA and licence application submissions
- Be clear on what, and how much, information is required
- Establish communication with the licensee/applicant
- Implement processes to track issues and information
- Recognize overlap in reviews early and ensure the right staff involvement to avoid duplication of effort and lost time
- Dedicate sufficient, qualified staff to process planning and project review
- Manage the timing of reviews and hearing preparation
- Apply lessons learned to other radioactive waste disposal initiatives
Concluding Comments

- The CNSC is responsible for 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
- Communication and cooperation with other agencies leads to a sound, comprehensive review