CNSC

READY FOR THE FUTURE

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nuclearsafety.gc.ca

CANADIAN NUCLEAR SAFETY COMMISSION (CNSC) OVERVIEW

HIGHLIGHTS OF CURRENT NUCLEAR REGULATORY ACTIVITIES

THE CNSC'S READINESS TO REGULATE PROJECTS INVOLVING SMALL MODULAR REACTORS

MY PRIORITIES AS THE NEW CNSC PRESIDENT

CLOSING REMARKS

CANADIAN NUCLEAR SAFETY COMMISSION

OUR MANDATE

Regulate the use of nuclear energy and materials to protect **health, safety,** and **security** 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

MORE THAN 70 YEARS OF REGULATORY EXPERIENCE

INDEPENDENT COMMISSION

Quasi-judicial administrative tribunal

Agent of the Crown (duty to consult)

Reports to Parliament through Minister of Natural Resources

Commission members are independent and part-time

Commission hearings are public and webcast

Decisions are reviewable by Federal Court

TRANSPARENT, SCIENCE-BASED DECISION MAKING

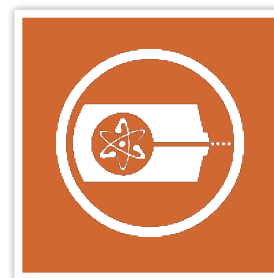# THE CNSC REGULATES ALL NUCLEAR FACILITIES AND ACTIVITIES IN CANADA

Uranium mines and mills

Uranium fuel fabrication and processing

Nuclear power plants

Nuclear substance processing

Industrial and medical applications

Nuclear research and educational activities

Transportation of nuclear substances

Nuclear security and safeguards

Import and export controls

Waste management facilities

OVER THE FULL LIFECYCLE OF THESE ACTIVITIES

CNSC STAFF LOCATED ACROSS CANADA

Human Resources: 915 FTEs
Licensees: 1,700
Licences: 2,500

Headquarters (HQ) in Ottawa

4 Site Offices at Power Plants
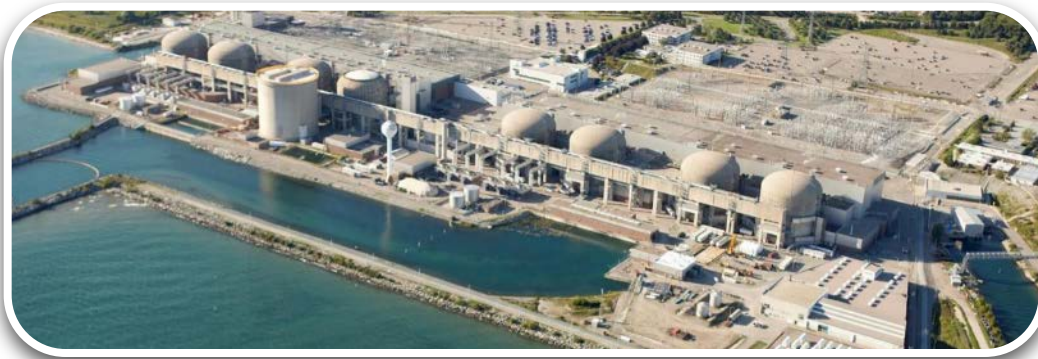
1 Site Office at Chalk River

4 Regional Offices

Calgary

Saskatoon

Chalk River   **HQ**

Laval

Point Lepreau

Bruce
Mississauga

Darlington
Pickering

HIGHLIGHTS OF CURRENT NUCLEAR REGULATORY ACTIVITIES

STATUS OF CANADA'S FLEET OF NUCLEAR POWER PLANTS

PICKERING NGS (ONTARIO)

Licence expires August 2028

6 operating reactors, 3100 Mwe capacity

Permanent shutdown in 2024

DARLINGTON NGS (ONTARIO)

Licence expires November 2025

3 operating reactors + 1 refurbishment,

3512 MWe capacity

All 4 reactors will be refurbished

New build licence to prepare site expires 2022

STATUS OF CANADA'S FLEET OF NUCLEAR POWER PLANTS

B **BRUCE NGS A & B (ONTARIO)**

Licence expires May 2020

8 operating reactors, 6232 Mwe capacity

Hearings on application for licence renewal finished in May; Commission decision is pending

Refurbishment plan: 2 completed, 6 to be carried out by 2033

L **POINT LEPREAU NGS (NEW BRUNSWICK)**

Licence expires June 2022

1 operating reactor, 705 MWe capacity

Refurbished and returned to service in 2012

# WASTE AND DECOMMISSIONING PROJECTS

CNSC

CANADIAN NUCLEAR LABORATORIES

THREE ENVIRONMENTAL ASSESSMENTS UNDER WAY FOR CANADIAN NUCLEAR LABORATORIES DECOMMISSIONING PROJECTS

- Two in Ontario (Chalk River Laboratories and Rolphton), one in Manitoba (Whiteshell)
- Attracting much public attention
- Environmental Assessment process is delayed pending CNL's responses to questions arising from application review

OPG DEEP GEOLOGIC REPOSITORY (DGR)
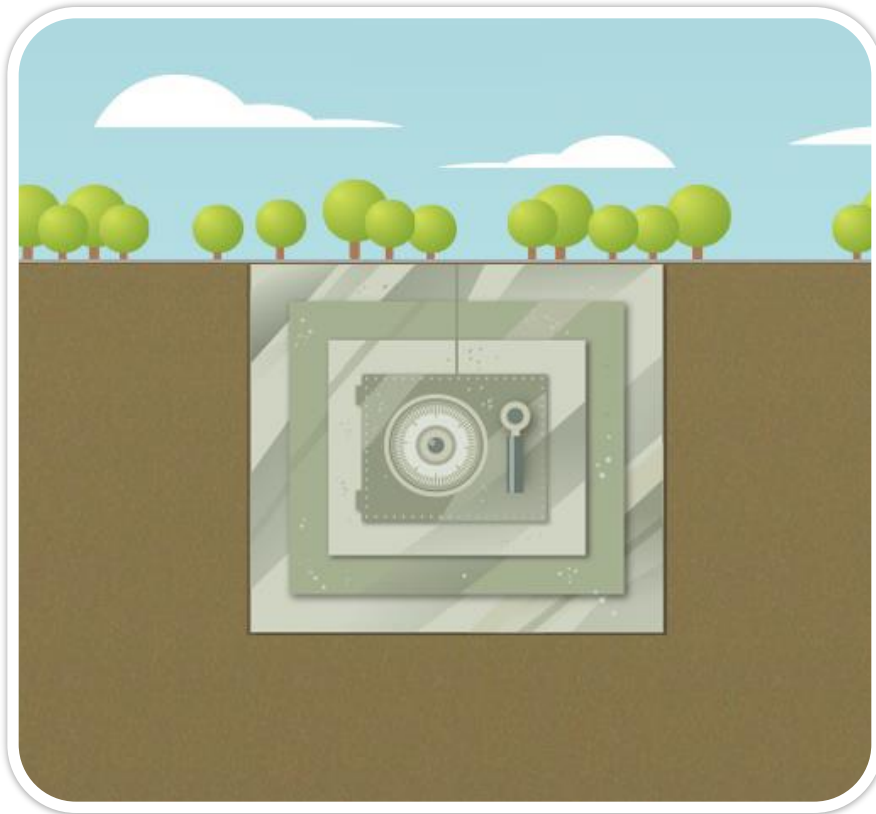
DEEP GEOLOGIC REPOSITORY

- Ontario Power Generation proposal for a low and intermediate-level facility on Bruce nuclear site

- EA was completed in 2015

- Decision from Minister of Environment and Climate Change Canada pending

NUCLEAR WASTE MANAGEMENT ORGANIZATION (NWMO)

NWMO
Learn more communities
1. South Bruce
2. Hornepayne
3. Huron-Kinloss
4. Ignace
5. Manitouwadge

SPENT FUEL REPOSITORY – NUCLEAR WASTE MANAGEMENT ORGANIZATION

- NWMO conducting a process to find a willing host community – 5 of 22 sites remain under consideration

- CNSC has conducted early engagement with communities and Indigenous groups to explain the regulatory process

THE CNSC'S READINESS TO REGULATE PROJECTS INVOLVING SMALL MODULAR REACTORS

SMALL MODULAR REACTORS (SMRs)

SIGNIFICANT INTEREST IN CANADA

- Potential uses
  - Providing energy to northern and remote communities
  - Power source for mining/industrial operations
  - Grid connected power generation
- Utility, Federal and Provincial governments interest
- Canadian Nuclear Laboratories (CNL) – Request for Expression of Interest (RFEOI) for SMR demonstration project – proposes to host an SMR by 2026
- New Brunswick Government investing in nuclear research cluster

PAN-CANADIAN SMR ROADMAP

- Led by Natural Resources Canada in response to the October 2017 House of Commons Standing Committee report on nuclear energy

- Brings together Federal, Provincial/territorial governments, utilities and key stakeholders

- Roadmap will identify the opportunities for SMR applications in Canada

- Will serve to guide important decisions and reduce uncertainty

- The CNSC is an observer providing regulatory clarity to roadmap participants

THE CNSC HAS A MANDATE TO DISSEMINATE INFORMATION ABOUT CANADIAN REGULATORY REQUIREMENTS AND PROCESSES

ELEMENTS OF REGULATORY READINESS STRATEGY

ESTABLISHED PROCESSES FOR ENABLING DECISIONS FOR REGULATION

REGULATORY FRAMEWORK

Nuclear Safety and Control Act (NSCA), regulations, licences, regulatory documents

RISK-INFORMED PROCESSES

Managed processes covering strategic decision making
Pre-licensing and licensing compliance

CAPABLE AND AGILE STAFF

Capacity/capability
Training
International cooperation

REGULATORY READINESS

ENHANCING AND STREAMLINING OUR FRAMEWORK

- Currently, regulations under the *Nuclear Safety and Control Act* (NSCA) are **already suitable** for regulating SMRs

- The CNSC is actively working to further improve the existing regulatory framework

  o **CNSC discussion paper DIS-16-04**, *Small Modular Reactors: Regulatory Strategy, Approaches and Challenges* was published in 2016

  o *REGDOC-1.1.5 , Licence Application Guide: Small Modular Reactor Facilities* – Out for public consultation since July 31, 2018

  o *Nuclear Security Regulations* being amended to be more flexible and better accommodate SMR facilities

ALL REGULATORY REQUIREMENTS ARE COVERED UNDER CURRENT FRAMEWORK

VENDOR DESIGN REVIEW (VDR)

What is a VDR?

- Objective: to verify the acceptability of a nuclear power plant design with respect to Canadian nuclear regulatory requirements, codes and standards
- It is not a certification process and is not a licence
- It is an optional assessment of a nuclear power plant design based on a vendor's reactor technology

Benefits:

- Identify and address regulatory issues early to minimize delays in licensing and facility construction
- Higher-quality licence applications
- Efficient and effective licensing process
- Assists decision makers in quantifying project risks (informing cost and schedule estimates)
- Provides regulatory clarity on the expectations of the CNSC

VENDOR DESIGN REVIEWS IN PROGRESS

VDR no.	Country of Origin	Company	Reactor type / Output per unit
1	Canada/U.S.	Terrestrial Energy	Molten salt integral / 200 MWe
2	U.S./Korea/China	UltraSafe Nuclear/Global First Power	High-temperature gas prismatic block / 5 MWe
3	Sweden/Canada	LeadCold	Molten lead pool fast spectrum / 3 – 10 MWe
4	U.S.	Advanced Reactor Concepts	Sodium pool fast spectrum /100 MWe
5	U.K.	U-Battery	High temperature gas prismatic block / 4 MWe
6	U.K.	Moltex Energy	Molten salt fast spectrum / ~300 MWe
7	Canada/U.S.	StarCore Nuclear	High-temperature gas prismatic block / 10 MWe
8	U.S.	SMR, LLC. (A Holtec International Company)	Pressurized Water / 160 MWe
9	U.S.	NuScale Power	Integral Pressurized Water / 50 MWe
10	U.S.	Westinghouse Electric Co.	eVinci Micro Reactor / < 25 MWe

DETERMINING APPROPRIATE LICENSING STRATEGY

APPLICANTS

Potential licensees (applicants) are encouraged to consult with the CNSC early

- Discuss the nature of the proposed application
- CNSC can consider the appropriate approach and strategy to deal with all safety and control areas and advise the applicant of the CNSC's expectations

Applicant needs to ensure that all the licensing requirements are met

- Engagement with stakeholders, the public and impacted Indigenous groups
- Environmental considerations
- Site security
- Emergency planning

INTERNATIONAL COLLABORATION ON SMRs

The CNSC and Government of Canada are cooperating and sharing information with a number of countries on SMR technologies

Working closely with the International Atomic Energy Agency and the Nuclear Energy Agency on sharing best practices in the regulation of SMRs

Working bilaterally with a number of countries (e.g., United States, United Kingdom)

Leveraging the experience of others - CNSC technical review can be informed by other regulators' assessments

OVERSIGHT OF THE SUPPLY CHAIN – ROLE OF LICENSEES

THE LICENSEE MUST RETAIN CORE CAPABILITIES TO UNDERSTAND, SPECIFY, AND OVERSEE NUCLEAR SAFETY-RELATED WORK UNDERTAKEN ON ITS BEHALF BY CONTRACTORS

- Core capabilities include technical, operational and managerial elements

- Global experience from new build and refurbishment projects has shown that a strong supply chain management framework is important to prevent latent safety issues

THIS RESPONSIBILITY IS ARTICULATED THROUGHOUT THE CNSC REGULATORY FRAMEWORK

MY PRIORITIES AS THE NEW CNSC PRESIDENT

THE CNSC REMAINS A WORLD-CLASS REGULATOR

SAFETY IS OUR HIGHEST PRIORITY

- Independent

- Flexible, robust regulatory framework

- Well-resourced with the capacity, expertise and agility to regulate effectively

- Forward-looking to stay ahead of the technological curve – ready for emerging technologies

STRENGTHENING PUBLIC TRUST

Transparency

- Open/responsive and understandable information

Engagement

- Public
- Civil society
- NGOs
- Indigenous groups
- Domestic and international counterparts

OUR GOAL: FOR THE PUBLIC TO HAVE CONFIDENCE IN THE REGULATOR

WOMEN IN SCIENCE, TECHNOLOGY, ENGINEERING, MATH (STEM) CAREERS

THANK YOU

QUESTIONS?

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Canadian Nuclear Safety Commission / Commission canadienne de sûreté nucléaire

Canada