



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Canada



Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2021

Commission Meeting

November 3, 2022

CMD 22-M34.A



CNSC Staff Presentation

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Outline

- Introduction
- General results for nuclear power plants (NPPs) and associated waste management facilities (WMFs)
- Highlights for each NPP and the WMFs
- Closing remarks



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INTRODUCTION



Indigenous Consultation and Engagement

Pickering and Darlington Sites

- Alderville First Nation
- Curve Lake First Nation
- Hiawatha First Nation
- Mississaugas of Scugog Island First Nation
- Beausoleil First Nation
- Georgina Island First Nation
- Rama First Nation
- Mohawks of the Bay of Quinte
- Métis Nation of Ontario

Gentilly-2

- Grand Conseil de la Nation Waban-Aki
- Nation Huronne-wendat

Point Lepreau Site

- Wolastoqey Nation of New Brunswick (representing 6 Maliseet communities)
- Mi'gmawé'l Tplu'taqnn (representing 9 Mi'kmaq communities)
- Kopit Lodge (representing Elsipogtog First Nation)
- Peskotomuhkati Nation

Bruce Site

- Saugeen Ojibway Nation
- Historic Saugeen Métis
- Métis Nation of Ontario



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CNSC Compliance Verification Program



The safety performance of NPPs and WMFs is assessed by CNSC staff using the results of activities conducted through the compliance verification program.

- **Verification activities** include surveillance by onsite inspectors at NPPs, inspections and compliance assessments
- CNSC staff track actions until closure and verify compliance via follow-up activities
- Over **1,300 findings** derived from compliance verification activities
- Licensees submitted **232 event** reports and over **90 scheduled reports** during the year, and these were reviewed by CNSC staff

Risk-informed and performance-based approach



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GENERAL RESULTS FOR NPPS AND WMFS



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General Safety Performance and Observations

- Radiological releases to environment were below regulatory limits
- Radiological doses to the public and workers were below regulatory limits
- All nuclear material in Canada remained in peaceful activities and Canada's international obligations were fulfilled
- All reportable events were of low safety significance
 - Licensees took appropriate follow-up actions
- Unplanned reactor transients were managed safely
- Lost-time injuries and accidents were below World Association of Nuclear Operators (WANO) industry targets

The public and the environment were protected



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Security Performance and Observations

All SCAs were rated “Satisfactory” (SA) for all NPPs and WMFs, with the exception of the Security SCA at Darlington and Pickering NPPs, which were rated “Below Expectations” (BE).

- The BE ratings have been discussed in an **in-camera session** with the Commission
- Details provided to the Commission in CMD 22-M34.B



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HIGHLIGHTS FOR EACH NPP



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Darlington Nuclear Generating Station

Power reactor operating licence:

January 2016 – November 2025

- Units 1, 2 and 4 operational in 2021
- Unit 3 entered refurbishment activities in September 2020
- Licence Conditions Handbook (LCH) revision in June, 2021
- Satisfactory progress on IIP – as of December 31 2021, 69% of IIP complete



Darlington Nuclear Generating Station

Source: OPG



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Darlington Nuclear Generating Station Highlights

- The Periodic Safety Review (PSR) Basis Document was submitted by OPG in Sept. 2020, and accepted by CNSC staff in Jan. 2021
 - OPG submitted 15 Safety Factor Reports, which will form the basis for development of the 2025-2035 IIP
 - This IIP will be used to support the next licence renewal application, expected in 2024
- The Commission amended the Darlington PROL to include authorization for a new activity and licence condition related to the production of Mo-99
 - The Commission established 2 Regulatory Hold Points and provided the CNSC EVP-CROO with the authority to remove them

CNSC staff continued effective oversight
of these major projects during the pandemic



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Pickering Nuclear Generating Station

Power reactor operating licence:

September 2018 – August 2028

- Authorization from the Commission is required to operate beyond 2024
- Units 1, 4, 5, 6, 7 and 8 operational in 2021
- Units 2 and 3 defueled in 2008
- CNSC staff revised LCH in April 2021
- All IIP commitments are now completed by OPG and closed by the CNSC



Pickering Nuclear Generating Station

Source: OPG



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Pickering Nuclear Generating Station Highlights

- PNGS experienced no reactor trips and the reactor trips performance against the target for 2021 was better than industry performance target
- CNSC staff confirmed that all special safety systems for PNGS met their unavailability targets in 2021
- CNSC staff confirmed that PNGS critical corrective maintenance backlogs continued to remain very low



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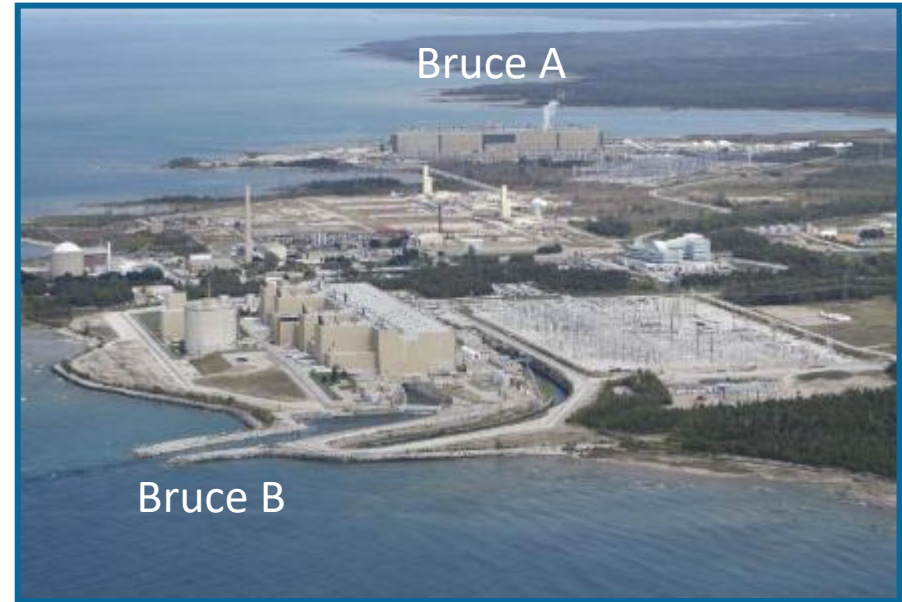
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Bruce A and Bruce B Nuclear Generating Stations

Power reactor operating licence:

October 2018 – September 2028

- Units 1 - 5, 7, 8 were fully operational in 2021
- Bruce Power continued major component replacement (MCR) outage on Unit 6
- CNSC staff revised LCH in September 2021
- Satisfactory progress on IIP - As of December 31, 2021, 28% of IIP complete



Bruce A and Bruce B Nuclear Generating Stations

Source: Bruce Power



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Bruce A and Bruce B Nuclear Generating Stations Highlights

- Bruce Power along with the CANDU industry is addressing the issue of elevated Heq in the inlet and outlet ends of some pressure tubes
- In 2021, both Bruce A and B experienced no reactor trips and the reactor trips performance against the target for 2021 was better than industry performance target
- CNSC staff confirmed that all special safety systems for Bruce A and B met their predicted unavailability targets in 2021
- In 2021, the preventive maintenance completion ratio at both Bruce A and B has recovered to above 93%



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Point Lepreau Nuclear Generating Station

Power reactor operating licence:

July 2022 – June 2032

- No LCH revision in 2021
- Satisfactory progress on IIP, related to relicensing PSR - As of December 31, 2021, 81% of IIP complete
- Part I Public Hearing for licence renewal in January 2022 and Part II in May 2022
- PROL renewed for a period of ten years following the relicensing hearing



Point Lepreau Nuclear Generating Station

Source: NB Power



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Point Lepreau Nuclear Generating Station Highlights

- CNSC staff conducted an independent sampling of food, seafood and medicinal plants with representatives from Indigenous Nations. There were no results of concern found during this sampling campaign
- In 2021, CNSC staff reviewed NB Power's revised 2021 Safety Report and found all updates to be in accordance with REGDOC-2.4.1 *Deterministic Safety Analysis*
- NB Power revised Environmental Risk Assessment (ERA) in 2021 to address CNSC comments. CNSC staff confirmed the revision against the requirements of CSA N288.6
- The New Brunswick Emergency Measures Organization (NBEMO), along with NB Power, completed Exercise Synergy Challenge in 2021. CNSC staff verified that the exercise was conducted in accordance with REGDOC-2.10.1



Réunion de la Commission, le 3 novembre 2022

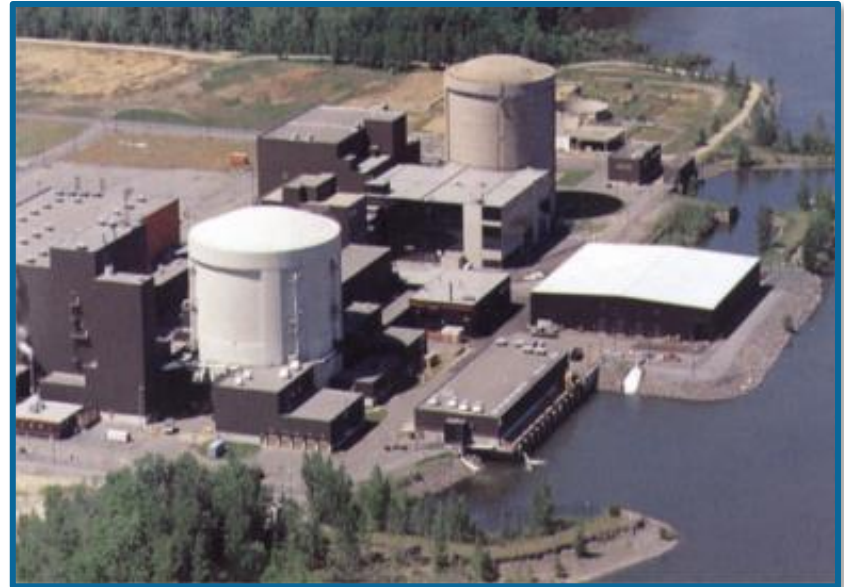
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Installations de Gentilly-2

Permis de déclasser d'un réacteur nucléaire de puissance :

Juillet 2016 à juin 2026

- Les activités en préparation du déclasser de Gentilly-2 (Campagne de stockage à sec) suivent leur cours en 2021.
- Aucune mise à jour fait au MCP en 2021



Installations de Gentilly-2

Source: Hydro-Québec



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HIGHLIGHTS FOR WMFS



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Darlington Waste Management Facility

Waste Facility Operating Licence:

March 2013 to April 2023

- OPG processes and stores used nuclear fuel generated at DNGS
- OPG manages intermediate level waste from refurbishment activities at DNGS
- No LCH revisions in 2021



Aerial view of Darlington Waste Management Facility

Source: OPG



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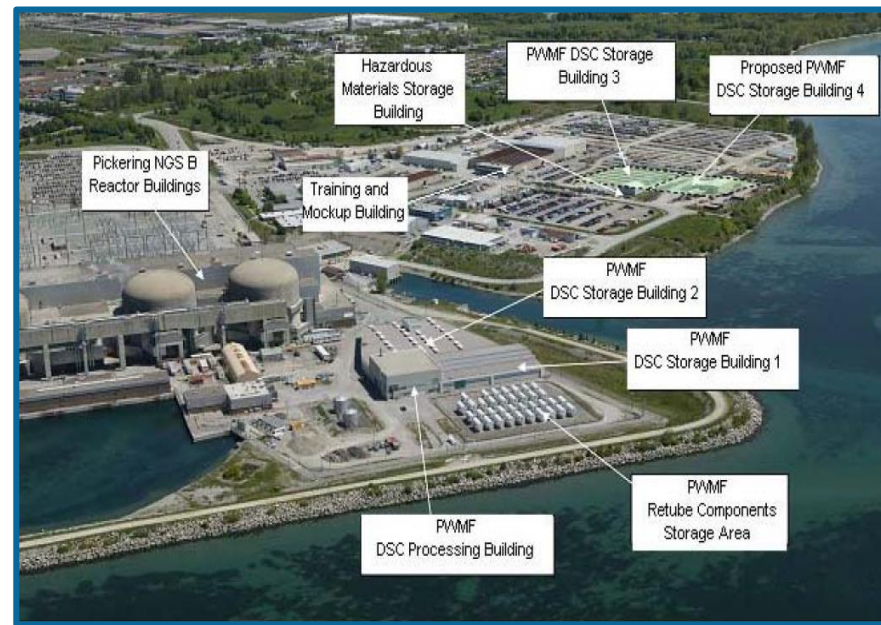
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Pickering Waste Management Facility

Waste Facility Operating Licence:

April 2018 – August 2028

- OPG processes and stores used nuclear fuel generated at PNGS
- OPG manages intermediate level waste from refurbishment activities at PNGS
- Following CNSC staff acceptance of commissioning report, delegated authority authorized OPG to operate storage building 4
- No LCH revisions in 2021



Aerial view of Pickering Waste Management Facility

Source: OPG



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Western Waste Management Facility & Radioactive Waste Operations Site 1

Waste Facility Operating Licence:

June 2017 – May 2027

- OPG processes and stores used nuclear fuel and manages intermediate level waste from refurbishment activities at BNGS
- OPG manages low and intermediate level waste generated from operations at DNGS, PNGS and BNGS
- Following CNSC staff acceptance of commissioning report, delegated authority authorized OPG to operate storage buildings 5 and 6
- No LCH revisions in 2021

Waste Nuclear Substance Licence:

October 2019 – October 2029

- In a state of care and maintenance
- No LCH revisions in 2021



Aerial view of Western Waste Management Facility;
Source: OPG



Aerial view of Radioactive Waste
Operations Site 1 Source: OPG



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Waste Management Facilities Highlights

In 2021, CNSC staff confirmed that:

- OPG operated DWMF, PWMF, WWMF, RWOS-1 in accordance with the operating policies, principles and operational safety requirements
- Maximum reported worker doses at WMFs were below regulatory limits
- There were no lost-time injuries at WMFs in 2021
- Releases to environment from WMFs were below regulatory limits and action levels



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CLOSING REMARKS



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Interventions on 2021 NPGS ROR

CNSC staff observed the following issues raised through interventions:

- Safe Operating Envelope
- Collective Dose to workers
- Radionuclides/Derived Release Limits/Open Government website
- Indigenous engagement and consultation/ representation in the ROR
- Content and scope of ROR

CNSC staff consideration of these issues are
provided in supplemental CMD 22-M34.B



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Final Conclusions

- Indigenous Nations and communities, the public and the environment were protected
- Reported doses to workers and public were below regulatory limits
- All nuclear material in Canada remained in peaceful activities and Canada's international obligations were fulfilled
- Issues identified during compliance verification activities and events were either addressed or are being addressed by licensees
- SCAs rated Satisfactory for all NPPs and WMFs with the exception of the Security SCA for Darlington and Pickering

Operations at
NPPs and
WMFs were
conducted
safely



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