



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Canada



Regulatory Oversight Report for Canadian Nuclear Power Generating Sites: 2020

Commission Meeting
December 15, 2021
CMD 21-M36.A



CNSC Staff
Presentation

e-Doc 6643290 (PPTX)
e-Doc 6697774 (PDF)



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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
- Response to the pandemic
- Closing remarks



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INTRODUCTION



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CNSC Regulatory Oversight Reports – 2020

- November 23, 2021
 - Use of Nuclear Substances in Canada
- November 25, 2021:
 - Canadian Nuclear Laboratories Sites
- December 15-16, 2021:
 - **Canadian Nuclear Power Generating Sites**
 - Uranium Processing and Nuclear Substance Processing Facilities
 - Uranium Mines and Mills



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Nuclear Power Generating Sites in 2020

LEGEND

Waste Type Stored

- Low-level waste
- Intermediate-level waste
- Spent fuel

Reactor Status

- In-service within design life
- Returned to Service
- In refurbishment
- Safe storage

Pickering

Waste:

Reactor Status:

Bruce A & B

Waste:

Reactor Status:

Gentilly-2

Waste:

Reactor Status:

Point Lepreau

Waste:

Reactor Status:

Darlington

Waste:

Reactor Status:



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Indigenous Engagement and Consultation (1/2)

CNSC staff would like to acknowledge the Indigenous Nations and communities whose traditional and/or treaty territories are in proximity to the sites covered in this ROR and the organizations that represent them.

Pickering and Darlington Sites

- Williams Treaty First Nations (7 different First Nations)
- Métis Nation of Ontario
- Mohawks of the Bay of Quinte

Gentilly-2

- The Grand Conseil de la Nation Waban-Aki (2 different First Nations)
- Nation huronne-wendat

Point Lepreau Site

- Wolastoqey Nation of New Brunswick (7 different First Nations)
- Mi'gmawe'l Tplu'taqnn (9 different First Nations)
- Peskotomuhkati Nation

Bruce Site

- Saugeen Ojibway Nation (2 different First Nations)
- Historic Saugeen Métis
- Métis Nation of Ontario



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Indigenous Engagement and Consultation (2/2)

Nuclear power generating sites fall within the traditional and treaty territories of many Indigenous Nations and communities.

- CNSC staff inform Indigenous Nations and communities of this report and participant funding opportunities
- CNSC staff continue to engage and identify opportunities to discuss and address topics of interest and concern
- CNSC staff continue to conduct ongoing engagement with interested Indigenous Nations and communities, including the implementation and development of Terms of Reference for long-term engagement

CNSC is committed to building long-term relationships with Indigenous Nations and communities



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CNSC Compliance Verification Program

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

- Compliance verification activities include surveillance by onsite inspectors at NPPs, inspections and technical 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 221 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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Regulatory Oversight Report (ROR)

- Provides a summary of CNSC staff compliance verification activities and the performance results associated with those activities for a given calendar year
- Project team activities:
 - Assembled compliance and performance information for the specific areas (SpAs) that comprise each safety and control area (SCA)
 - Rated each SpA based on compliance and performance information
 - Rated each SCA based on SpA ratings
- 2020 NPGS report is similar in structure to 2019 NPGS report
- Additional information on CNSC regulatory framework provided in “General Description of Regulatory Framework for Nuclear Power Generating Sites”



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GENERAL RESULTS FOR NPPS AND WMFS



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General Safety Performance and Observations

All SCAs were rated “Satisfactory” (SA) for all NPPs and WMFs

- All reportable events were of low safety significance
 - Licensees took appropriate follow-up actions
- Unplanned reactor trips and transients were managed safely
- The public and the environment were protected
 - Radiological releases to environment were below regulatory limits
 - Radiological doses to the public and workers were below regulatory limits
- Lost-time injuries and accidents were below WANO industry targets
- Licensees met applicable requirements related to nuclear security and Canada’s international obligations



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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 - 4 operational in 2020
- Unit 2 returned to service in June 2020, and Unit 3 entered refurbishment activities in September 2020
- CNSC accepted the Basis Document for the next Periodic Safety Review in January 2021
- No Licence Conditions Handbook (LCH) revision in 2020



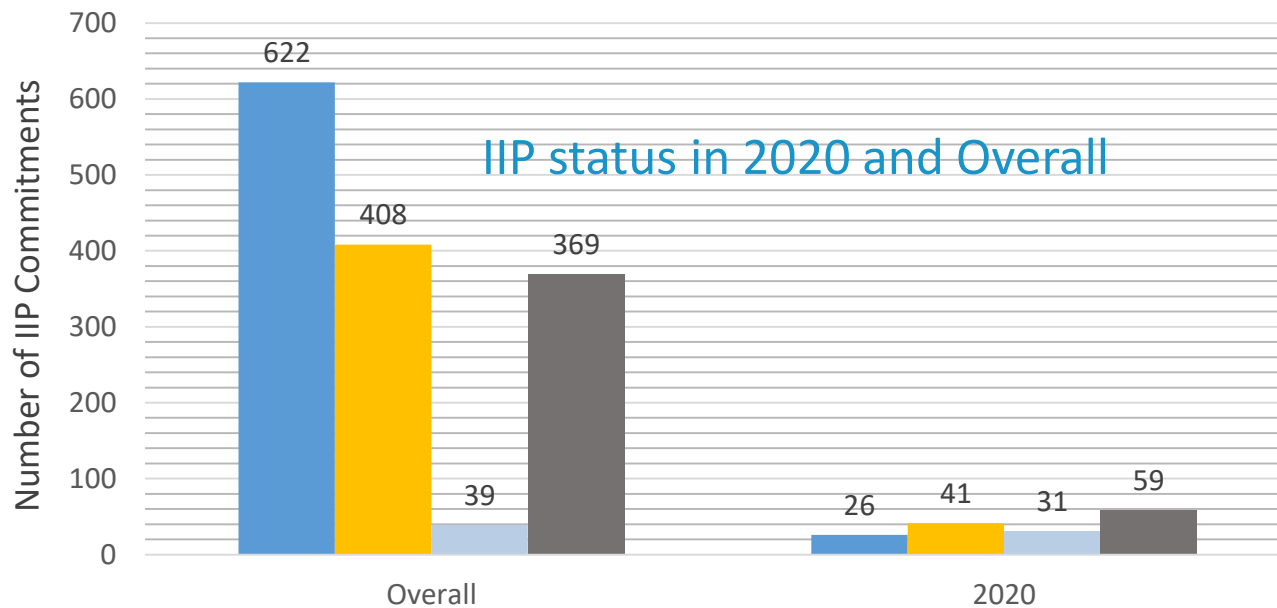


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Darlington Nuclear Generating Station Highlights (1/3)

Status as of December 31, 2020



Satisfactory progress on Integrated Implementation Plan (IIP) commitments

- Planned by OPG
- Completed by OPG
- Under CNSC Review
- Closed by CNSC



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Darlington Nuclear Generating Station Highlights (2/3)

- Compliance oversight activities are ongoing with Unit 3 defueling and draining activities completed at the end of 2020
- CNSC staff oversight of Unit 2 refurbishment activities confirmed that
 - IIP was being implemented, as required
 - Regulatory requirements were met and Unit 2 was returned to service in June 2020

CNSC staff continued effective oversight
of refurbishment during the pandemic



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Darlington Nuclear Generating Station Highlights (3/3)

CNSC staff assigned “satisfactory” ratings for all SCAs at the DNGS in 2020, with some notable improvements:

- OPG made considerable effort to improve its performance in the area of radiological hazard control. CNSC staff noted a clear improvement in this area compared to staff’s assessment in 2019
- Chemistry Control was strong and compared favourably with industry averages
- Preventive maintenance deferrals and backlogs for corrective and deficient maintenance remained low and were better than industry averages



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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 2020
- Units 2 and 3 defueled in 2008
- CNSC staff revised LCH in April 2020



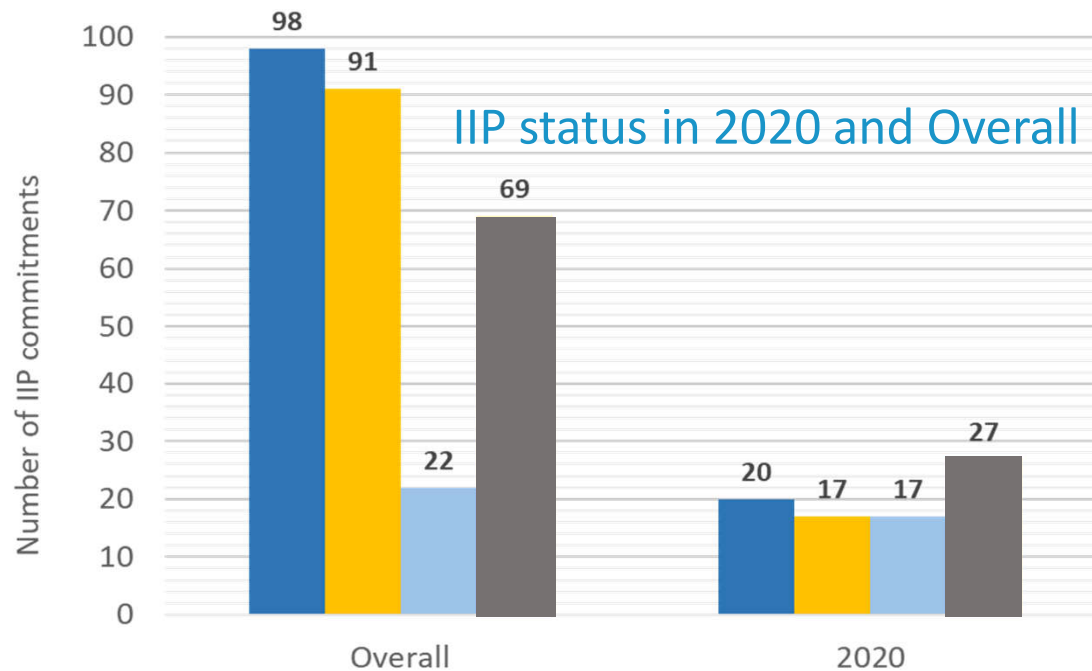


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Pickering Nuclear Generating Station Highlights (1/3)

Status as of December 31, 2020



Status update on IIP commitments

- Planned by OPG
- Completed by OPG
- Under CNSC review
- Closed by CNSC



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Pickering Nuclear Generating Station Highlights (2/3)

Fish impingement monitoring and Fisheries Act authorization (FAA)

- No observed impingement in 2020 of Schedule 1 (Species at Risk Act) fish species
- 3,525.72 kg biomass of fish impinged in 2020
- Fisheries & Oceans Canada are reviewing OPG request to amend the FAA

Thermal Plume Monitoring

- OPG submitted “Potential Effects of PNGS Thermal Plume on the Survival of Round Whitefish Embryos, 2018-2020” thermal plume monitoring report
- CNSC staff and Environment and Climate Change Canada (ECCC) are currently reviewing OPG's submission



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Pickering Nuclear Generating Station Highlights (3/3)

Compliance Verification - Inspections

- CNSC staff Type I inspection of the operations program concluded that OPG has adequately defined, developed, implemented, and maintained the Nuclear Operations Program at PNGS
- CNSC staff conducted maintenance related inspections that confirmed OPG's maintenance program consistently met applicable regulatory requirements
- CNSC conducted an on-site inspection during a PNGS full-scale emergency exercise
 - Findings were related to exercise planning, control, and dosimetry practices
 - OPG addressed all non-compliant findings to CNSC staff satisfaction



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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 2020
- Bruce Power started major component replacement (MCR) outage on Unit 6
- CNSC staff revised LCH in May 2020



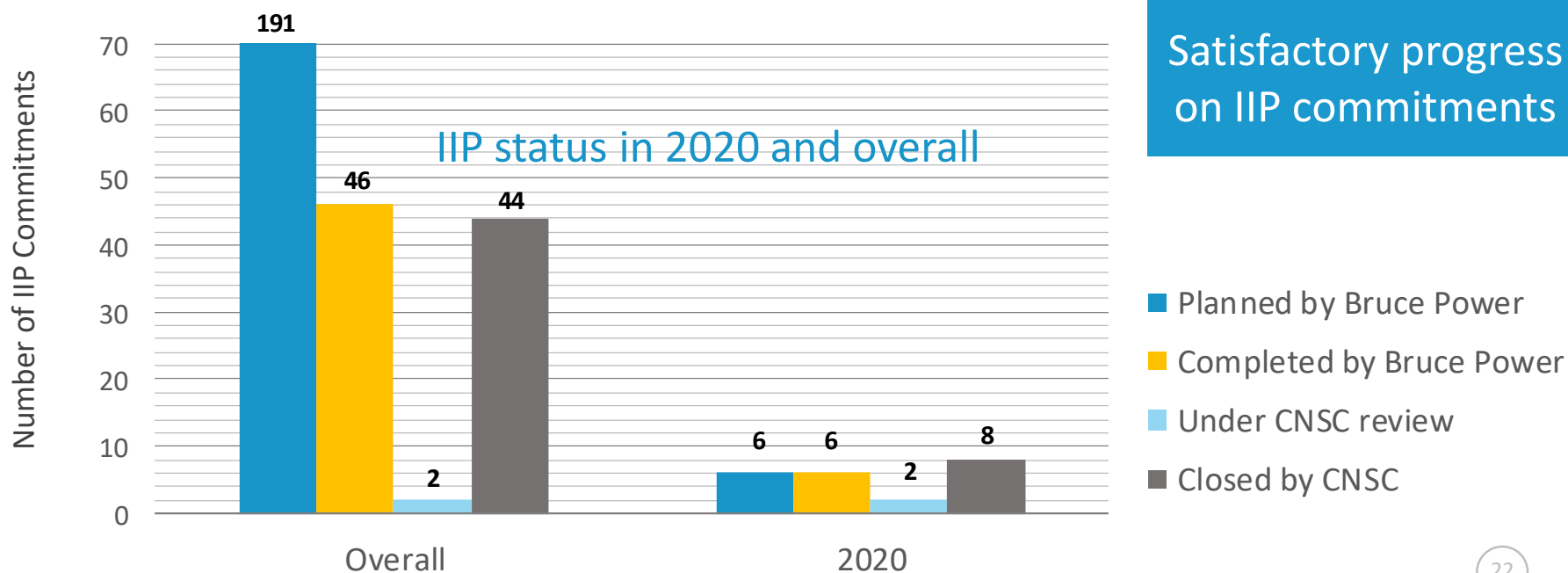


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Bruce A and Bruce B Nuclear Generating Stations Highlights (1/3)

Status as of December 31, 2020





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Bruce A and Bruce B Nuclear Generating Stations Highlights (2/3)

- Bruce Power submitted updated deterministic pressure tube fracture protection assessments
- Lutetium-177 isotope project at Bruce B is ongoing
- CNSC staff confirmed that special safety systems for all units met availability targets with one exception for Bruce B
 - No significant impact on station safety
 - Adequate corrective actions



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Bruce A and Bruce B Nuclear Generating Stations Highlights (3/3)

- CNSC staff confirmed that Bruce Power is compliant with the aging management requirements
- CNSC staff also focused in 2020 on:
 - Business continuity during the pandemic
 - Relations with Indigenous Nations and communities during the pandemic
 - Monitoring the fitness for service of fuel channels to verify that pressure tube fracture toughness will be sufficient for safe operation



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Point Lepreau Nuclear Generating Station

Power reactor operating licence:

July 2017 – June 2022

- Part I Public Hearing for licence renewal in January 2022 and Part II in May 2022
- Periodic Safety Review completed and CNSC staff accepted the IIP in June 2021
- No LCH revision in 2020





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Point Lepreau Nuclear Generating Station Highlights (1/2)

- CNSC staff confirmed planning and execution of 2020 outage
 - NB Power met all regulatory undertakings and commitments
- Maintenance Safety Performance Indicators continued to be maintained
 - Deferrals of preventive maintenance - Steady
 - Corrective maintenance backlog - Steady
 - Deficient maintenance backlog - Trending down
- CNSC staff are satisfied with NB Power's *Solid Radioactive Waste Management Facility* reports



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Point Lepreau Nuclear Generating Station Highlights (2/2)

Probabilistic safety assessment (PSA) reviews

- CNSC staff reviewed NB Power's revised PSA methodologies and related PSA reports and determined them to be acceptable
- NB Power submit Level 1 and 2 Internal Event at-power and shutdown PSAs in 2020 as part of the 2021 PSA update – currently under review by CNSC staff



Réunion de la Commission, le 15 décembre 2021

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Installations de Gentilly-2

Permis de déclassement d'un réacteur nucléaire de puissance :

Juillet 2016 à juin 2026

Les activités de déclassement à Gentilly-2 (Campagne de stockage à sec) suivent leur cours en 2020.





Réunion de la Commission, le 15 décembre 2021

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Gentilly-2 Faits Saillants

COVID-19

Hydro-Québec a déployé le plan d'urgence – Risque Biologique en mars 2020

Inspection

Le personnel de la CCSN a réalisé une inspection à distance portant sur l'Exercice incendie



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HIGHLIGHTS FOR WMFS



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Waste Management Facilities Highlights (1/4)

Operated by OPG

- Waste Facility Operating Licences
 - DWMF: March 2013 to April 2023
 - PWMF: April 2018 to August 2028
- CNSC staff revised LCH for DWMF and PWMF In July 2020

Darlington
Waste
Management
Facility
(DWMF)



Pickering
Waste
Management
Facility
(PWMF)





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Waste Management Facilities Highlights (2/4)

Operated by OPG

- WWMF:
 - Waste Facility Operating Licence
 - June 2017 – May 2027
 - CNSC staff revised LCH in August 2020
- RWOS-1:
 - Waste Nuclear Substance Licence
 - October 2019 – October 2029
 - LCH issued in 2020

Western
Waste
Management
Facility
(WWMF)



Radioactive
Waste
Operations
Site 1
(RWOS-1)





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Waste Management Facilities Highlights (3/4)

In 2020, 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 well below regulatory limits
- There were no lost-time injuries at WMFs in 2020
- Releases to environment from WMFs were below regulatory limits and action levels



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Waste Management Facilities Highlights (4/4)

Inspections

- In 2020, CNSC staff conducted inspections at DWMF and WWMF
 - DWMF: General Inspection; Fitness for Service
 - WWMF: General Inspection; Management System
- CNSC inspections at DWMF and WWMF resulted in non-compliant findings with regulatory requirements

Reportable Events

- OPG reported 8 events for the WMFs in 2020
- CNSC staff were satisfied with OPG's actions and corrective measures



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REGULATORY RESPONSE TO PANDEMIC



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Regulatory Response to Pandemic

- CNSC activated its business continuity plan (BCP) and modified regular compliance activities by developing procedures
 - Where feasible, on-site inspections being conducted with remote participation from subject matter experts
- CNSC staff worked with licensees to provide comprehensive and remote access to licensee information systems, for example:
 - Including actual plant data
 - Corrective action database
 - Participation in all key plant management meetings



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Regulatory Oversight of Licensees During Pandemic

- CNSC staff confirmed that licensees implemented their BCPs
- CNSC staff approved requests for regulatory flexibility to defer certain activities, for example:
 - Security exercises
 - Full-scale emergency exercise
 - Planned outage
- CNSC staff confirmed that licensees took measures to ensure minimum shift complement was not compromised by the pandemic, for example:
 - Restricted access to the plant, especially the Main Control Room
 - Staggering shift changes to minimize the number of staff in the same area
 - Using thermal imaging cameras to check for fever when accessing site

CNSC staff are
confident that
licensees
operated safely
during pandemic



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CLOSING REMARKS



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Themes from Interventions on 2020 NPGS ROR

CNSC staff observed the following themes from interventions:

- Fisheries Act Authorization review/fish impingement
- Provincial Nuclear Emergency Response Plan (PNERP) Technical Study
- Radionuclides/Derived Release Limits
- Indigenous engagement and consultation
- Content and scope of ROR

CNSC staff responses to key themes provided in supplemental CMD 21-M36.B



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Final Conclusions

- Effective CNSC compliance verification program
- Issues identified during compliance verification activities and events were either addressed or are being addressed by licensees
- Public and environment were protected
- Reported doses to workers and public were below regulatory limits
- SCAs rated Satisfactory for all NPPs and WMFs
- All nuclear material in Canada remained in peaceful activities
- Effective response to pandemic

Operations
at NPPs and
WMFs were
conducted
safely



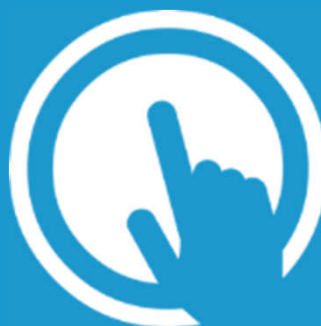
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