



CNSC REGULATORY OVERSIGHT REPORT FOR PICKERING AND DARLINGTON NUCLEAR GENERATING SITES: 2023

UPDATE TO DURHAM NUCLEAR HEALTH COMMITTEE

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Indigenous Consultation and Engagement

Pickering and Darlington Sites



Williams Treaties First Nations:

- 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

Interested Indigenous Nations and communities:

- Métis Nation of Ontario*
- Mississaugas of the Credit First Nation
- Mohawks of the Bay of Quinte
- Six Nations of the Grand River
- Saugeen Ojibway Nation*

CNSC



- Canadian Nuclear Safety Commission (CNSC) is responsible for ensuring the safety of Canadians and the environment by regulating the nuclear industry in Canada
- As Canada's independent nuclear regulator, we make licensing decisions pursuant to the *Nuclear Safety and Control Act* and related regulations
- The CNSC will only issue a licence if it is satisfied that the proposed nuclear facility or activity is safe for the health, safety and security of persons and the environment
- CNSC produces an annual Regulatory Oversight Report (ROR) for Canadian Nuclear Generating Stations (NGS)
- 2023 ROR posted in October 2024 on CNSC website
- Public Commission Meeting re: NGS ROR - to be held February 25, 2025

General Safety Performance and Observations (all NPPs and all WMFs)



- NPPs and associated WMFs on their respective sites operated safely and complied with the applicable requirements for all safety and control areas in 2023
- Licensees took appropriate corrective actions for events reported to CNSC
- NPPs and WMFs operated within the bounds of their operating policies and principles
- There were no serious process failures at the NPPs
- Radiation doses to the public and workers were below regulatory limits
- Releases to the environment were within safe limits
- Frequency and severity of non-radiological injuries to workers were low
- Licensees met applicable requirements related to Canada's international obligations; safeguards inspection results were acceptable to International Atomic Energy Agency

People and the environment were protected

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 800 findings from Darlington and Pickering compliance verification activities in 2023
- Reviewed 78 reportable events (Darlington & Pickering) in 2023
- Reviewed over 90 scheduled reports from each licensee in 2023
- All SCAs rated “Satisfactory” (SA) for Pickering and Darlington NPPs and WMFs in 2023

Risk-informed and performance-based approach



NUCLEAR POWER PLANTS

Pickering Nuclear Generating Station (PNGS)



- PNGS Power reactor operating licence is for 10 years (2018-28)
- Units 2 and 3 defueled in 2008
- Unit 1 was shutdown Oct. 1, 2024
- Unit 4 to shutdown Dec. 31, 2024
- PROL amended Oct. 2024 to authorize OPG to operate PNGS Units 5–8 to Dec. 31, 2026



Pickering Nuclear Generating Station
Image source: OPG

June 2024 Commission Hearing



- In 2023, OPG submitted an application to extend operation of Units 5-8 to Dec. 31, 2026
- June 19-20, 2024 Public Commission Hearing held in community re: OPG application to operate Units 5–8 to Dec. 31, 2026
- CNSC received 54 interventions from members of the public, Indigenous Nations and communities, and stakeholders
- Intervention themes included: engagement with Indigenous Nations and communities; fitness for service; climate change; and emergency preparedness
- Several community organizations and businesses provided examples of OPG’s public engagement practices
- Summary Record of Decision (DEC 24-H5) issued Oct. 11, 2024
 - Power reactor operating licence amended: Commission authorized OPG to operate PNGS Units 5–8 to Dec. 31, 2026

PNGS Units 5-8 refurbishment



- On February 1, 2024, OPG notified the CNSC of intent to apply for authorization to refurbish Units 5-8
- Refurbishment requires Commission authorization
- If OPG applies for authorization, application will be considered at a public hearing of the Commission
- Public, civil society organizations, and Indigenous Nations and communities would have opportunity to intervene at public hearing
- PNGS Power Reactor Operating Licence (PROL); Pickering Waste Management Facility Operating Licence (WFOL)
 - OPG intends to apply for early renewal of PROL & WFOL
 - requesting consolidation of PMWF WFOL into PROL
 - OPG plans to submit a licence renewal application (~Q3 2025)
 - OPG plans to request a 10 year licence term

2023 PNGS Highlights



- OPG Safety Reports update were reviewed by CNSC staff and found to meet regulatory requirements
- Critical corrective maintenance backlog was very low
- All special safety systems met unavailability targets
- Accident severity rate (ASR), Accident Frequency (AF), and Industrial Safety Accident Rate (ISAR) below Canadian NPP industry average
- CNSC staff reviewed OPG's Environmental Risk Assessment (ERA) and Predictive Effects Assessment (PEA)
 - ERA and PEA results indicate that meaningful human health or ecological risks attributable to PNGS operations are unlikely
- CNSC issued administrative monetary penalty (AMP) to OPG re: security program at Pickering and Darlington nuclear generating stations

Darlington Nuclear Generating Station (DNGS)

Power reactor operating licence: January 2016 – November 2025



- Refurbishment complete on Unit 2 (2020), Unit 3 (2023)
- Refurbishment is expected to complete on Unit 1 in Nov 2024 and Unit 4 early 2026
- Relicensing hearings to be held in 2025
- Periodic Safety Review completed for 2025-2035



Darlington Nuclear Generating Station
Source: OPG

DNGS Radioisotopes Projects



Cobalt-60

- The Commission amended OPG's license in spring 2024 to allow for Co-60 production in all 4 reactors
- Co-60 rods are currently installed in Unit 1, they will be installed in other units during planned maintenance outages

Medical Isotopes

- OPG installed a Target Delivery System (TDS) on Unit 2 and is now producing Molybdenum-99 for medical applications
- OPG has applied to amend the PROL to produce additional medical isotopes using the TDS – hearing in writing expected to take place in early 2025



Mo-99 Shipping Flask
Source: OPG

2023 DNGS Highlights



- In 2023, the critical corrective maintenance backlog, deficient maintenance backlog and the number of critical preventive maintenance deferrals were very low.
- The average preventive maintenance completion ratio was 96%, which is indicative of good performance by OPG Darlington.
- CNSC staff confirm that all special safety systems for DNGS met their Actual Past Unavailability (APU) targets in 2023, except for Emergency Coolant Injection (ECI).
- CNSC staff's assessments determined that OPG met regulatory requirements in environmental protection.
- DNGS achieved over 6.3 million person-hours without a lost time injury



PICKERING & DARLINGTON WASTE MANAGEMENT FACILITIES

Pickering Waste Management Facility (PWMF)

Waste Facility Operating Licence

April 2018 – August 2028



Darlington Waste Management Facility (DWMF)

Waste Facility Operating Licence:

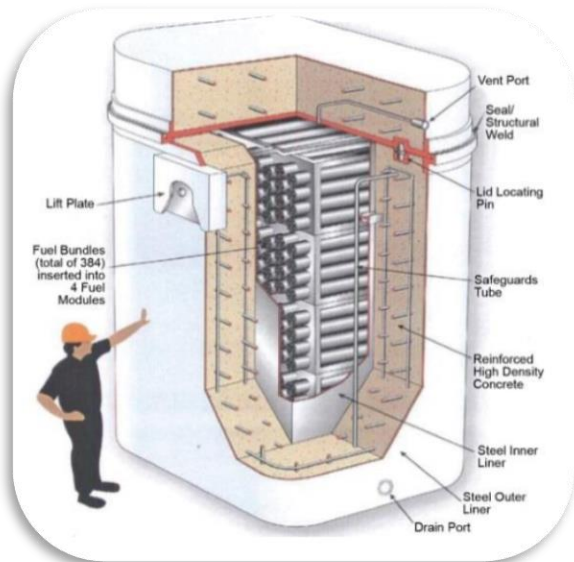
May 2023 – April 2033



PWMF & DWMF Operations



- OPG processes and stores dry storage containers (DSC) containing used nuclear fuel generated at Pickering and Darlington Nuclear Generating Stations
- OPG stores intermediate level waste generated from refurbishment activities at Pickering and Darlington Nuclear Generating Stations



2023-2024 Updates for PWSMF



In 2023, OPG submitted a licensing basis amendment application:

- In the application, OPG requested to process and store a maximum of 100 DSCs containing a minimum of 6-year cooled fuel.
- CNSC staff assessed OPG's application and recommended that the licensing basis be amended as requested.
- On August 3, 2024, the Commission issued a summary Record of Decision (DEC 24-H102) amending the PWSMF licensing basis and authorizing OPG to process and store a maximum of 100 DSCs containing a minimum of 6-year cooled fuel.
- OPG has loaded two DSCs and will be submitting a commissioning report for CNSC staff review and acceptance.

2023-2024 Updates for PWMF (cont'd)



In 2024, OPG submitted a licence amendment application:

- In the application, OPG is requesting authorization to construct and operate a new structure, Pickering Component Storage Structure (PCSS).
- The PCSS intends to store low and intermediate level waste from future Pickering decommissioning activities and proposed refurbishment activities of Pickering units 5-8.
- CNSC staff are currently conducting a technical assessment of OPG's application.
- The Commission will make a regulatory decision on this licence amendment application through a hearing in writing with public interventions.

2023-2024 Updates for DWMF

In 2023, OPG submitted a construction notification for used fuel dry storage structure #3

- On October 24, 2023, CNSC staff provided written approval for OPG to carry out the site preparation and construction.
- CNSC staff have been informed by OPG that the commissioning report for SS3 will be submitted in January 2025.



2023 PWMF & DWMF Highlights



In 2023, through various compliance activities, CNSC staff confirmed that:

- OPG met their target of transferring 70 DSCs from PNGS to PWMF and 57 DSCs from DNGS to DWMF.
- OPG operated PWMF and DWMF in accordance with the regulatory requirements.
- Maximum reported worker doses at the PWMF and DWMF were below regulatory limits.
- Releases to environment from the PWMF and DWMF were below regulatory limits and action levels.
- There were no lost-time injuries in 2023.
- OPG's proposed change to the effluent monitoring program was acceptable. OPG is no longer required to monitor particulate emissions from the DSC processing building at the PWMF and DWMF.

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

Operations at NPPs and WMFs were conducted safely



Commission canadienne
de sûreté nucléaire

Canadian Nuclear
Safety Commission

Canada



Questions?

nuclearsafety.gc.ca