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Safety Commission

Commission canadienne  
de sûreté nucléaire

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## **STATUS REPORT ON POWER REACTORS**

## **RAPPORT D'ÉTAPE SUR LES CENTRALES NUCLÉAIRES**

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This document summarized the status of  
the Power Reactor Facilities as of  
November 10, 2025.

Ce rapport résume le rapport d'étape sur  
les centrales nucléaires en date du 10  
novembre 2025.

Signed on / Signé le  
**November 19, 2025**

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Alexandre Viktorov, Ph. D.  
Director General, Directorate of Power Reactor Regulation  
Directeur général, Direction de la réglementation des centrales nucléaires

## 1. Power Reactors Status as of November 10, 2025

### 1.1 Bruce A and B

<b>Operational Status</b>
Unit 1 is at Full Power
Unit 2 is Shut Down for a Planned Maintenance Outage
Unit 3 is Shut Down for Major Component Replacement (MCR)
Unit 4 is Shut Down for Major Component Replacement (MCR)
Unit 5 is at Full Power
Unit 6 is at Full Power
Unit 7 is at Full Power
Unit 8 is at Full Power
<b>Licensing</b>
Power Reactor Operating Licence expires on September 30, 2028.
<b>Comments</b>
<p>The Unit 3 MCR Project started in March 2023 and remains on schedule. Fuel load is scheduled for January 2026.</p> <ul style="list-style-type: none"> <li>• The Moderator system refill is complete.</li> <li>• Lower feeder installation is in progress.</li> <li>• CNSC staff are performing verification activities to confirm adequate completion of pre-requisites for releasing regulatory hold points established by the Commission.</li> </ul> <p>The Unit 4 MCR Project started in February 2025 and remains on schedule.</p> <ul style="list-style-type: none"> <li>• The moderator system drain and dry process is in progress.</li> <li>• Lower feeder removal is complete.</li> </ul> <p>On September 20, 2025, Unit 2 was shut down for a planned maintenance outage. The outage scope was increased to partially rewind the Generator Stator and perform chemical cleaning of the Stator Cooling Water system. The projected outage completion date is December 15, 2025.</p>
<b>Event Notifications and Updates</b>
None
<b>Actions from previous Commission meetings</b>
The Commission directed CNSC staff to track on-going work on hydrogen equivalent concentration (Heq) research and development (R&D) in a Record of Decision (DEC 23-H103) issued on October 13, 2023. The progress update is provided in Section 1.6 of this report.

## 1.2 Darlington

Operational Status
Unit 1 is at Full Power
Unit 2 is at Full Power
Unit 3 is at Full Power
Unit 4 is Shut Down for Refurbishment
Licensing
<p>Power Reactor Operating Licence expires on November 30, 2025. Renewed licence will come into effect on December 1, 2025.</p> <ul style="list-style-type: none"> <li>OPG submitted a licence renewal application on May 31, 2024. The Commission's Record of Decision, issued on September 25, 2025, granted a 20-year licence renewal, which will take effect on December 1, 2025.</li> </ul>
Comments
<p>Unit 4 refurbishment started in July 2023.</p> <ul style="list-style-type: none"> <li>Primary heat transport system hydrostatic test successfully completed</li> <li>Fuel load is complete</li> <li>Regulatory Hold Point 2 (approval to remove GSS) is anticipated for December 12, 2025.</li> </ul>
Event Notifications and Updates
<p>On November 6, 2025, CNSC staff issued a request pursuant to Subsection 12(2) of the <i>General Nuclear Safety and Control Regulations</i> to OPG as a result of a Type II inspection conducted to evaluate the full-scale emergency exercise "Unified Command 2025" (<a href="https://www.cnsccsn.gc.ca/eng/acts-and-regulations/regulatory-action/letter-opg-2025-11-06/">https://www.cnsccsn.gc.ca/eng/acts-and-regulations/regulatory-action/letter-opg-2025-11-06/</a>).</p> <p>During the inspection, CNSC staff identified gaps requiring corrective actions in OPG's deployment of EME, including:</p> <ul style="list-style-type: none"> <li>Failure to demonstrate that EME can be successfully deployed in order to fulfill its purpose (e.g., by providing cooling water from the forebay and providing electricity to repower key indications and components)</li> <li>Inadequate maintenance of equipment essential to emergency response (e.g., 4 out of 5 Portable Uninterruptable Power Supplies (PUPS) being unavailable, seals on the dry-riser enhancements not adequately maintained)</li> <li>Lack of staff proficiency in the deployment, operation and connection of EME</li> <li>Failure to validate the adequacy of the Phase 2 EME deployment guide.</li> </ul> <p>CNSC site inspectors have observed the immediate corrective actions undertaken by OPG, specifically those associated with the confirmation of EME operability. While OPG has started addressing the EME deficiencies, CNSC staff will verify that OPG ensures the long-term</p>

sustainability and effectiveness of the emergency management program. OPG is expected to provide information a response to the 12(2) request by December 19, 2025.

#### Actions from previous Commission meetings

None

### 1.3 Pickering

#### Operational Status

Unit 1 is shut down and transitioning to Safe Storage

Unit 2 is in a Safe Storage State

Unit 3 is in a Safe Storage State

Unit 4 is shut down and transitioning to Safe Storage

Unit 5 is at Full Power

Unit 6 is Shut Down for a Planned Maintenance Outage

Unit 7 is at Full Power

Unit 8 is at Full Power

#### Licensing

Power Reactor Operating Licence expires on August 31, 2028. OPG is authorized to operate Units 5-8 until December 31, 2026, up to a maximum of 305,000 equivalent full power hours.

#### Comments

Unit 6 is shut down for a planned maintenance outage and is projected to return to service by November 29, 2025.

#### Event Notifications and Updates

##### Unit 6

On November 7, 2025, a leak was identified in the Fire Resistant Fluid (FRF) system from a heat exchanger on the secondary (non-nuclear) side of Unit 6. The FRF system was subsequently shut down and isolated to prevent additional leakage to the Condenser Cooling Water (CCW) discharging effluent stream. The event was categorized as a Category “C” spill or a “Less Serious Spill”. OPG notified CNSC staff and the Ontario Ministry of Environment, Conservation and Parks (MECP) as a result of this event. OPG’s investigation is ongoing and CNSC staff continue to monitor OPG’s corrective actions.

##### Units 2 and 3

OPG has commenced risk-reduction activities by removal of non-nuclear equipment from the Units 2 and 3 Turbine Hall. CNSC staff are satisfied that these removal activities meet CNSC regulatory requirements and CNSC staff continue to oversee this work as part of its compliance verification program.

#### Actions from previous Commission meetings

None

## 1.4 Point Lepreau

Operational Status
The Unit is shut down for a Planned Outage
Licensing
Power Reactor Operating Licence expires on June 30, 2032
Comments
The unit was shutdown on July 14, 2025, for a planned maintenance outage. CNSC staff continued to conduct oversight and compliance verification activities throughout the outage. CNSC staff were satisfied that NB Power completed their work safely and maintained the reactor in a safe configuration. Outage related regulatory commitments are on track to be completed. The targeted synchronization date is December 1, 2025.
Event Notifications and Updates
None
Actions from previous Commission meetings
None

## 1.5 Darlington New Nuclear Project

Construction Status – DNNP-1
Major construction work in progress: <ul style="list-style-type: none"> <li>Excavation of the Reactor Building shaft, Condenser Cooling Water (CCW) Tunnel Boring Machine (TBM) launch shaft, and the Forebay shaft</li> <li>Pre-assembly of the Diaphragm Plate-Steel Composite (DP-SC) basemat</li> <li>Welding rehearsals on the Diaphragm Plate-Steel Composite (DP-SC) mock up and concrete flow validation tests.</li> <li>Installation of pile foundations for the Turbine, Radwaste, and Control Buildings</li> <li>The rock splitting work is in progress for reactor building excavation and is expected to be completed by the first quarter of 2026.</li> <li>OPG successfully conducted the first rock blasting activity test in the CCW shaft on November 3<sup>rd</sup></li> </ul>
Licensing
Power Reactor Construction Licence to construct a single BWRX-300 reactor and supporting infrastructure for up to three additional reactors. issued on April 04, 2025, expires on March 31, 2035. LCH revision 0 issued on April 14, 2025.

Summary status of the DNNP and OPG's progress toward each regulatory hold point:

- RHP-1: Installation of the Reactor Building (RB) Foundation (OPG target date is Calendar Q1 Mar 2026)  
 Changes to RHP1 commitments: None since last report  
 Status: 17 open, 6 closed, 23 total
- RHP-2: Installation of the Reactor Pressure Vessel (RPV) (OPG target date is Calendar Q3 2027)  
 Changes to RHP2 commitments: None since last report  
 Status: 23 open, 0 closed, 23 total
- RHP-3: Fuel-Out Commissioning (OPG target date is Calendar Q3 2028)  
 Changes to RHP3 commitments: None since last report  
 Status: 7 open, 0 closed, 7 total

#### Comments

None

#### Event Notifications and Updates

On August 25, 2025, CNSC staff reported to the Commission CMD 25-M36 an Event Initial Report (EIR) regarding multiple workplace accidents at the construction site of DNNP. CNSC staff also issued a request pursuant to Section 12(2) of the *General Nuclear Safety and Control Regulations* (GNSCR) to seek assurance that OPG has implemented an effective response to prevent further injuries.

Following these incidents, CNSC staff have increased surveillance and monitoring activities related to conventional health and safety, and contractor management at the DNNP site. In addition, CNSC staff are attending OPG's safety performance meetings and have requested OPG to provide the root cause investigation report.

On October 29, 2025, OPG provided a summary of vendor event investigation report to support its response to the 12(2) GNSCR request. This letter noted that OPG's vendor Aecon has identified four key challenges through its investigation and plans to implement corrective actions and complete effectiveness assessments by the second quarter of 2026. The four key challenges are stated below:

1. Fragmented Safety Culture – inconsistent practices and unsafe behaviors.
2. Ineffective Front-Line Field Presence – supervisors and Environment Health and Safety (EHS) staff not spending effective time in the field.
3. Misuse of Procedures & Protocols – gaps in communication, paperwork, and process adherence.
4. Limited Planning & Coordination – inefficiencies across the design-to-construct cycle and ineffective meeting cadence.

Based on the information provided, CNSC staff conclude that OPG's response to the 12(2) GNSRC request is adequate. To date, CNSC staff are satisfied with the immediate corrective actions OPG and Aecon have taken and acknowledge ongoing progress toward the implementation of long-term corrective actions. CNSC staff will continue to track OPG's actions and assessments through reactive compliance activities.

**Actions from previous Commission meetings**

None

## 1.6 Other

### **CNSC staff assessment of progress on hydrogen equivalent concentration (Heq) research and development (R&D) program commitments by Bruce Power and OPG**

In [DEC 23-H103](#), the Commission directed “CNSC staff to provide updates on Bruce Power’s progress in its research and development (R&D) activities through the regular Status Report on Power Reactors, which is presented at each public Commission Meeting. CNSC staff shall develop a consolidated table to track and communicate the ongoing work to the Commission through the aforementioned Status Report on Power Reactors”.

Although the Commission’s direction was to report specifically on Bruce Power’s progress on its R&D activities, CNSC staff note that the Heq-related R&D program is conducted jointly between Bruce Power and OPG.

R&D plans from OPG and Bruce Power were presented to the Commission during a [Meeting](#) held on November 1-3, 2022 ([CMD 22-M37.1](#) and in [CMD 22-M37.3](#), respectively).

Since the last update to the Commission in CMD 25-M32, industry has provided their sixth semi-annual update and CNSC staff’s review of this latest update is ongoing. CNSC staff intend to report the results of this review to the Commission before December 31<sup>st</sup>, 2025. The report will include CNSC staff’s conclusions regarding the status of the R&D activities and whether the activities completed to date have sufficiently achieved the results necessary for the licensees to return to compliance with Licence Condition 6.1. Also, CNSC staff, OPG and Bruce Power intend to present a detailed update to the Commission during the Meeting in March 2026.

Progress against the original completion dates provided in the R&D plans summarized in CMD 25-M32, presented during a Commission Meeting held on October 7, 2025, and reproduced in the table below, continues to be acceptable. Delays from originally planned completion dates are due to scope increases and scheduling adjustments. CNSC staff are satisfied that these delays do not impact the current safety case for reactor operation and are not likely to impact the overall project deliverable.

<b>R&amp;D Activity</b>	<b>Planned Completion Date (from CMD 22-M37.1 and 22-M37.3)</b>	<b>Updated Status of R&amp;D Activities</b>
Update finite element software to simulate outlet rolled joint Heq evolution	Fall 2023	Software has been updated. Verification and validation activities are underway with a TCD of Fall 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Develop finite element software to simulate inlet rolled joint Heq evolution	Fall 2023	Software has been developed. Verification and validation activities are underway with a TCD of Fall 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Perform evaluation to assess the potential impact of the high levels of Heq on flaws at the inside surface of pressure tubes near the inlet region of interest	Fall 2023	Preliminary work was completed. Sensitivity studies for key input parameters are underway with a TCD of Fall 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Improve characterization of 'blip' and expected evolution of the inlet region of elevated Heq with continued operation	Spring 2024	Work has been completed
Confirm the potential roles of hydrogen isotope ingress and redistribution on the development of the inlet regions of elevated Heq	Summer 2023	Original work scope has been completed. Sensitivity studies are underway with a TCD of Summer 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Improve characterization of solubility behaviour of hydrogen isotopes in tubes with elevated Heq	Winter 2024	Work has been completed



<b>R&amp;D Activity</b>	<b>Planned Completion Date (from CMD 22-M37.1 and 22-M37.3)</b>	<b>Updated Status of R&amp;D Activities</b>
Enhance modeling of temperature distributions near the outlet rolled joint region of pressure tubes	Summer 2023	Work has been completed
Define input parameters required for interim updates to the Heq model	Summer 2023	Work has been completed
Develop interim Heq model	Fall 2024	Work has been completed
Validation activities for the interim Heq model to support development of final comprehensive model	Fall 2025	Progressing as planned - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Define input parameters required for the final comprehensive Heq model	Summer 2025	Progressing as planned - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Define the relative importance of variables influential to Heq evolution	Fall 2025	Progressing as planned - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Develop the final comprehensive Heq model	Winter 2026	Progressing as planned - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Complete hydride related crack initiation experiments for unirradiated material at Heq of 220 ppm or higher	Fall 2024	Bruce Power and OPG have revised the completion date to Spring 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Complete fatigue crack initiation experiments for unirradiated material at Heq of 220 ppm or higher	Fall 2024	Bruce Power and OPG have revised the completion date to Spring 2025 - Submitted in semi-annual update #6 and

R&D Activity	Planned Completion Date (from CMD 22-M37.1 and 22-M37.3)	Updated Status of R&D Activities
		CNSC staff's review is in progress
Complete crack initiation experiments for irradiated material with elevated Heq without flaws present	Fall 2024	Bruce Power and OPG have revised the completion date to Spring 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress
Complete crack initiation and crack growth experiments for irradiated material with elevated Heq with flaws present	Fall 2024	Bruce Power and OPG have increased the scope of this activity. Completion date has been revised to Spring 2025 - Submitted in semi-annual update #6 and CNSC staff's review is in progress