Canadian Nuclear Safety Commission

Commission canadienne de sûreté nucléaire

Record of Decision

DEC 24-H5

In the Matter of

Applicant	Ontario Power Generation Inc.
Subject	Application to Extend the Operation of the Pickering Nuclear Generating Station Units 5 to 8 until December 31, 2026
Hearing Dates	June 19-20, 2024
Summary Record of Decision Date	October 7, 2024
Detailed Record of Decision Date	December 17, 2024

RECORD OF DECISION – DEC 24-H5

Applicant:	Ontario Power Generation Inc.
Address/Location:	700 University Avenue, Toronto, Ontario, M5G 1X6
Purpose:	Application to extend the operation of the Pickering Nuclear Generating Station Units 5 to 8 until December 31, 2026
Application received:	June 16, 2023
Hearing dates:	June 19-20, 2024
Location:	Pickering Recreation Complex, 1867 Valley Farm Rd, Pickering, Ontario (and virtually via Zoom)
Date of decision:	December 17, 2024
Panel of Commission:	Dr. T. Berube, Acting President Dr. M. Lacroix Ms. A. Hardie
Registrar:	C. Salmon
Recording Secretary:	M. Young/C. Zou
General Counsel:	C. Howlett

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Intervenors		
See appendix A		
Other Government Representatives		
Emergency Management Ontario: M. Munro		
Fisheries and Oceans Canada: S. Eddy		

Licence: Amended
Operation of Pickering Nuclear Generating Station Units 5 – 8 to December 31, 2026: Authorized
Operation of Pickering Nuclear Generating Station Units 5 – 8 up to a maximum of 305,000 Equivalent Full Power Hours: Authorized

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1.0 INTRODUCTION

1. On June 16, 2023, Ontario Power Generation Inc. (OPG) submitted an application to the Canadian Nuclear Safety Commission[1] (CNSC), under subsection 24(2) of the *Nuclear Safety and Control Act*[2] (NSCA), for an amendment to the power reactor operating licence for its Pickering Nuclear Generating Station (PNGS) located in the Municipality of Durham, Ontario. The PNGS site is located on the traditional lands and waters of the Michi Saagiig Anishinaabeg, the Gunshot Treaty (1877-88), the Williams Treaties (1923), and the Williams Treaties Settlement Agreement (2018). On October 7, 2024, the Commission amended the licence for the PNGS.[3] This *Record of Decision* provides the detailed reasons for that decision.

2. The PNGS is comprised of two reactor facilities, PNGS-A and PNGS-B, which includes 8 CANDU[4] reactors and their associated equipment. Units 1-4 (PNGS-A) were put in service between 1971 and 1973. Units 5 – 8 (PNGS-B) were put in service between 1983 and 1986. Units 2 and 3 were defueled in 2008 and are currently in a safe storage with surveillance state. Units 1 and 4 each have a net electrical output of 515 megawatts-electric (MWe). Units 5 – 8 each has a net electrical output of 516 MWe. The PNGS also produces cobalt-60 (Co-60), a radioisotope with a variety of applications including nuclear medicine and the sterilization of medical and industrial equipment.

3. The current licence, PROL 48.01/2028, was renewed in August 2018[5] and expires on August 31, 2028. Under the current licence, OPG is authorized for the continued commercial operation of all operating reactor units until December 31, 2024, including the operation of PNGS Units 5 – 8 up to a maximum of 295,000 equivalent full power hours (EFPH). Commercial operation is to be followed by post-shutdown activities associated with the removal of fuel and water in preparation for the safe storage of all units. In its 2018 licensing decision, the Commission noted that operation of any PNGS reactor unit beyond December 31, 2024, would constitute a change to OPG's licensing basis and would require a decision from the Commission.

4. OPG is seeking authorization to extend the commercial operation of PNGS Units 5 – 8 until December 31, 2026, and increasing the operating limit for PNGS Units 5 – 8 to up to a maximum of 305,000 EFPH. In support of its application, OPG conducted a re-assessment of the periodic safety review (PSR) and a condition assessment of major components for PNGS Units 5 – 8. OPG plans to shut down PNGS Units 1 and 4 by December 31, 2024.

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[1] The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.
[2] S.C. 1997, c. 9.
[3] Summary Record of Decision DEC 24-5, *Application to extend the operation of the Pickering Nuclear Generating Station Units 5 to 8 until December 31, 2026*, October 7, 2024.
[4] All nuclear power reactors in Canada are CANDU (Canadian Deuterium-Uranium) reactors. CANDU reactors are pressurized heavy water reactors that use natural uranium as fuel and heavy water as a coolant and moderator.
[5] CNSC Record of Decision, *Application to Renew the Nuclear Power Reactor Operating Licence for the Pickering Nuclear Generating Station*, December 20, 2018.

Issues

5. In considering OPG's licence amendment application, the Commission is first required to determine whether and what requirements the *Impact Assessment Act*[6] (IAA) imposes in relation to the activities sought to be authorized.

6. Pursuant to paragraphs 24(4)(a) and (b) of the NSCA, in considering whether to amend the licence, the Commission must be satisfied that:

- OPG is qualified to carry on the activity that the amended licence would authorize; and
- in carrying on that activity, OPG will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

7. As an agent of the Crown, the Commission recognizes its role in fulfilling the Crown's constitutional obligations, along with advancing reconciliation with Canada's Indigenous peoples. The Commission's responsibilities include the duty to consult and, where appropriate, accommodate Indigenous interests where the Crown contemplates conduct which may adversely impact potential or established Aboriginal[7] or treaty rights[8]. As such, the Commission must determine what engagement and consultation steps and accommodation measures are called for, respecting Indigenous interests.

Public Hearing

8. On August 8, 2023, the Commission published a *Notice of Public Hearing and Participant Funding*[9] for this matter, which invited requests to intervene by April 29, 2024. On May 21, 2024, the Commission published a *Revised Notice of Public Hearing*[10] to announce the hearing date and location.

9. Pursuant to section 22 of the NSCA, the Acting President of the Commission established a Panel of the Commission over which he would preside, including Dr. M. Lacroix and Ms. A. Hardie, to consider the application. The Commission, in making its decision, considered information presented for a public hearing on June 19 and 20, 2024 in Pickering, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure* (the

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[6] S.C. 2019, c. 28, s. 1.
[7] "Aboriginal" is the term used in this document when referring to the Crown's duty to consult as that is the term used in s. 35 of the Constitution Act, 1982. In all other cases, "Indigenous" is the preferred terminology and used accordingly.
[8] *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73; *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74.
[9] *CNSC Notice of Public Hearing and Participant Funding*, August 8, 2023.
[10] *CNSC Revised Notice of Public Hearing*, May 21, 2024.

Rules).[11] During the public hearing, the Commission considered written submissions and heard oral presentations from OPG (CMD 24-H5.1, CMD 24-H5.1A and CMD 24-H5.1B) and CNSC staff (CMD 24-H5 and CMD 24-H5.A). The Commission also considered oral and written submissions from 54 intervenors (see Appendix A – List of Intervenors of this *Record of Decision* for a list of interventions). The hearing was webcast live via the CNSC website, with video archives available following the hearing.

Confidentiality Request

10. Alongside its application and supplemental submission, OPG submitted requests for confidentiality,[12] in accordance with subrule 12(1) of the Rules. On June 18, 2024, the Commission issued its decision[13] on OPG's request for confidentiality, setting out the measures it would take to protect information, pursuant to subrule 12(3) of the Rules.

CNSC Participant Funding Program

11. Pursuant to paragraph 21(1)(b.1) of the NSCA, the Commission has established a Participant Funding Program (PFP) to facilitate the participation of Indigenous Nations and communities, members of the public and stakeholders in Commission proceedings. In August 2023,[14] up to $100,000 in funding to participate in this hearing process was made available through the CNSC's PFP. A Funding Review Committee (FRC), independent of the CNSC, reviewed the funding applications received and made recommendations on the allocation of funds. Based on the recommendations from the FRC, the CNSC awarded a total of $92,161.48 to eight applicants,[15] and a subsequent recommendation for up to $16,600 to one more applicant.[16]

[11] SOR/2000-211.
[12] *OPG's Requests For Confidentiality of Material Submitted in Relation to CMD 24-H5*, March 28, 2024.
[13] CNSC Record of Decision, *Commission Ruling on Request to Protect Confidential Information in the Matter of OPG's application to amend its Pickering Nuclear Generating Station Power Reactor Operating Licence to extend the operation of Pickering Nuclear Generating Station Units 5 to 8 until December 31, 2026*, June 18, 2024.
[14] CNSC Participant funding notice, *Participant funding for Ontario Power Generation's application for authorization to operate Pickering Nuclear Generating Station Units 5 to 8 until 2026*, August 2023.
[15] *CNSC Participant Funding Program decision – Ontario Power Generation's application for authorization to operate Pickering Nuclear Generating Station Units 5 to 8 until 2026.*
[16] *CNSC Participant Funding Program decision – Meeting with Canadians for Nuclear Energy to discuss Ontario Power Generation's application for authorization to operate Pickering Nuclear Generating Station Units 5 to 8 until 2026*.

Requests for Rulings

12. Pursuant to rule 20 of the Rules, Pickering Harbour Company Limited, a subsidiary of Frenchman's Bay Harbour & Marine Service Company Limited (CMD 24-H5.33, CMD 24-H5.33A, CMD 24-H5.33B, and CMD 24-H5.33C) made 3 requests for rulings with respect to lands within the exclusion zone[17] around the PNGS, as follows:

    1. That the Commission require OPG to provide the intervenor with requested information and with an opportunity to review and respond to that information, before it renders its decision with respect to the extended operation of Pickering Units 5 – 8
    2. That the Commission use its regulatory authority under the NSCA to require that "OPG address its non-compliance with respect to the exclusion zone affecting our client's lands as a condition of the renewal of the licence for the Pickering Station"
    3. That the Commission "impose a condition on the granting of the licence through a licence amendment – to either mediate or arbitrate with respect to the continued use and compensation to Pickering Harbour Company Limited, Frenchman's Bay Harbour & Marine Service Company Limited with respect to the restrictions placed upon its lands."

13. The Acting President of the Commission, as a Panel of the Commission with respect to procedural matters for this hearing, considered the submissions made by the intervenor, as well as OPG (CMD 24-H5.1C) and CNSC staff (CMD 24-H5.B). The Acting President of the Commission also heard oral submissions during the hearing.

Request 1

14. Pickering Harbour Company Limited requested that the CNSC require OPG to provide it with the following information and with an opportunity to review and respond to that information, before CNSC provides any decision on the PROL extension for R5/8, namely:

    1. a full and detailed explanation with data on the initial calculation of the [exclusion] zone and the underlying assumptions. In addition, that OPG be required to provide all historical information relating to the initial calculation and the identification of the affected owners;
    2. confirmation whether the Preliminary Decommissioning Plan includes any re-calculations of the [exclusion] zone dimensions given that reactors 1 through 4 will be taken off line, and if so, what milestones will be used for such re-calculation;

[17] The *Class I Nuclear Facilities Regulations* define an **exclusion zone** as a parcel of land within or surrounding a nuclear facility on which there is no permanent dwelling and over which a licensee has the legal authority to exercise control.

3. what the timing of the milestones referred to in 2 above will be and how these relate or tie into the 4 states referred in OPG's supplementary report;
4. what time frames are associated with each of the 4 stages or states referred to in the supplementary report;
5. is there a mandatory review of any [exclusion] zone where nuclear facilities are taken off-line and permanently shut down.[18]

15. During the hearing, the representative of Pickering Harbour Company Limited stated that:

> "OPG responded to our April 24th request for more information on the impacts of the exclusion zone and milestones relating to the decommissioning for reactors 1 to 4 on the exclusion zone in a letter dated May 30th […] in their response of May 30th they advised OPG's application does not contemplate any reduction in exclusion zone either now or in the future nor does it include any relevant analysis regarding possible future treatment of exclusion zone. Therefore, it is clear that OPG wants to reserve the current exclusion zone line regardless of the change in its nuclear footprint in operations."[19]

16. An OPG representative stated that "OPG has no plans to seek amendment to the exclusion zone irrespective of the status of commercial operations of Units 1 and 4." The OPG representative added that OPG would be meeting with the intervenor on this matter in July.[20]

17. Given the current application and that OPG does not seek any change to the exclusion zone, the Commission considers the matter between the intervenor and OPG to be a matter beyond the scope of its consideration. The Commission heard OPG's willingness to meet with the intervenor and is of the view that OPG can volunteer to provide the requested information to the intervenor at its discretion.

Request 2

18. Pickering Harbour Company Limited requested that the Commission "use its regulatory authority under the *Nuclear Safety and Control Act* to require that OPG address its non-compliance with respect to the exclusion zone affecting our client's lands as a condition of the renewal of the licence for the Pickering Station."[21] Pickering Harbour Company Limited asserted that OPG does not have the "legal authority to exercise control" which is an element of the definition of exclusion zone given in the *Class I Nuclear Facilities Regulations*[22] (CINFR).

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[18] CMD 24-H5.33A.
[19] Transcript, June 20, 2024, page 7.
[20] Transcript, June 20, 2024, page 13.
[21] CMD 24-H5.1C.
[22] SOR/2000-204.

19. During the hearing, Pickering Harbour Company Limited further asserted that "OPG does not have any planning authority or the ability to control official plan status or zoning bylaws reflecting affecting our client's lands whatsoever under the *Planning Act*."[23]

20. During the hearing, an OPG representative stated that "OPG continues to meet CNSC requirements in order to protect the health, safety of persons and the environment in relation to the current uses of the exclusion zone."[24] CNSC staff stated that "OPG has informed the CNSC staff that it achieves this control primarily through municipal zoning bylaws and that the subject property is not zoned for residential dwelling and that a municipal bylaw amendment is needed before any development. And so, therefore, it is CNSC staff's position that the use and occupation on land within the exclusion zone is adequately controlled and that OPG is in compliance with this licence condition."[25]

21. The Commission finds OPG to be in compliance with CNSC regulatory requirements with respect to the exclusion zone for the PNGS. As such, no action is required from OPG.

Request 3

22. Pickering Harbour Company Limited submitted that:

> "If CNSC, after reviewing submissions on all of the foregoing, determines that the current [exclusion] zone cannot be reduced after 2024 for safety reasons, or that any reduction will take time and be tied to the four stages referred to above when reactors 1 through 4 are shutdown, then Pickering Harbour Company Ltd. submits that this will require an alteration to the existing licences in that OPG should be required to confirm that it does not control all the lands within the [exclusion] zone as currently required by its PROL and accordingly, any affected owner is entitled to compensation for the continued imposition of the [exclusion] zone on its/his/her/their lands. This should include a mandatory and expedited process for the determination of any such compensation."[26]

23. During the hearing, request 3 was re-stated as:

> "We are requesting a ruling that the Commission impose a condition on the granting of the licence that requires OPG to either mediate or arbitrate with respect to the continued use and compensation to our client with respect to the restrictions placed upon its lands."[27]

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[23] Transcript, June 20, 2024, page 10.
[24] Transcript, June 20, 2024, page 13.
[25] Transcript, June 20, 2024, page 15.
[26] CMD 24-H5.33A.
[27] Transcript, June 20, 2024, page 12.

24. Under subsection 24(5) of the NSCA, a licence may contain any term or condition that the Commission considers necessary for the purposes of the Act.[28] The purposes of the NSCA are "to provide for

> (a) the limitation, to a reasonable level and in a manner that is consistent with Canada's international obligations, of the risks to national security, the health and safety of persons and the environment that are associated with the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information; and
>
> (b) the implementation in Canada of measures to which Canada has agreed respecting international control of the development, production and use of nuclear energy, including the non-proliferation of nuclear weapons and nuclear explosive devices."[29]

The Commission notes that it does not have the authority to impose the condition requested or to order the compensation being sought by Pickering Harbour Company Limited. This is not a regulatory matter and is not within the purposes of the NSCA. The Commission, therefore, does not impose any such term or condition on OPG.

Rulings

25. With respect to the 3 requests for rulings, the Commission decides the following:

1. The Commission does not require OPG to provide the intervenor with the requested information before making its decision on the licence amendment application.
2. The Commission finds OPG to be in compliance with CNSC regulatory requirements with respect to the exclusion zone for the PNGS. As such, no further action is required from OPG.
3. The Commission does not impose any term or condition that would require OPG to participate in mediation or arbitration with the intervenor with respect to the use or compensation regarding the exclusion zone.

Mandate of the Commission

26. Several interventions addressed the economic impact of the PNGS. The Commission notes that, as the regulatory authority over nuclear matters in Canada, it has no economic mandate and does not base its decisions on the economic impact of a facility. The Commission's mandate is found in section 9 of the NSCA and includes the Commission's object to regulate the production and use of nuclear energy to prevent unreasonable risk to national security, the environment, and the health and safety of people, and to implement the international obligations to which Canada has agreed.

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[28] The purpose of the NSCA is set out in section 3 of the Act.
[29] NSCA, s 3.

27. Several intervenors expressed their views about the PNGS in relation to energy policy. The Commission notes that it is the Ontario government that determines Ontario's energy policy. Determination of energy policy is not a part of the mandate of the CNSC.

Scope of this Licence Amendment Application and Public Hearing

28. The scope of OPG's licence amendment application and of this public hearing is the amendment of the PNGS operating licence PROL-48.01/2028. It is not to consider the licensed activities at the Pickering Waste Management Facility (PWMF), which is also located on the Pickering nuclear site but is separately licensed under a Class IB Waste Facility Operating Licence.

2.0 DECISION

29. Based on its consideration of this matter, as described in more detail in the following sections of the Record of Decision, the Commission concludes the following:

- the Commission is satisfied that an impact assessment under the IAA is not required;
- the contemplated licence amendment does not present any novel adverse impact on any potential or established Aboriginal claim or right;
- the Commission's responsibility to uphold the honour of the Crown and its constitutional obligations with regard to engagement and consultation with Indigenous groups have been satisfied;
- OPG is qualified to carry on the activities that the amended licence will authorize; and
- OPG, in carrying out these activities, would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends the power reactor operating licence PROL-48.01/2028 issued to Ontario Power Generation Inc. for its Pickering Nuclear Generating Station located in Pickering, Ontario. The amended licence, PROL-48.02/2028, remains valid until August 31, 2028.

Additionally,

> the Commission authorizes Ontario Power Generation Inc. to operate the Pickering Nuclear Generating Station Units 5 – 8 to December 31, 2026, up to a maximum of 305,000 equivalent full power hours.

30. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 24-H5. Specifically, the Commission:

- amends PROL-48.01/2028 to remove licence condition 15.3, Pressure Tube Assessment for Safe Operation:

  "*Before Hydrogen equivalent concentration exceeds 120 ppm, the licensee shall demonstrate that pressure tube fracture toughness will be sufficient for safe operation beyond 120 ppm.*"; and

- amends PROL-48.01/2028 to add new licence condition 6.2, Fitness for Service Program for Fuel Channels in Extended Operation:

  "*The licensee shall implement and maintain an enhanced fitness for service program for fuel channels in extended operation.*"

3.0 ISSUES AND COMMISSION FINDINGS

31. In making its licensing decision, the Commission considered a number of relevant issues and submissions relating to OPG's qualification to carry out the activity the licence amendment would authorize. The Commission also considered the adequacy of OPG's proposed measures for preventing unreasonable risk to the environment, the health and safety of persons and national security and for compliance with international obligations to which Canada has agreed.

32. The matter before the Commission is an application to amend OPG's existing power reactor operating licence PROL-48.01/2028 to authorize the continued operation of PNGS Units 5 – 8 until December 31, 2026 and up to a maximum of 305,000 EFPH. OPG submitted its licence amendment application for the PNGS on June 16, 2023, with supplementary information to this application submitted to the CNSC on February 28, 2024. The Commission's decision focuses on the issues that it considers the most relevant for this application, specifically:

- the applicability of the *Impact Assessment Act*;
- assessment of the licence amendment application;
- reassessment of the periodic safety review;

- provisions for safety relevant to the proposed licence amendment in accordance with all 14 safety and control areas[30] (SCAs);
- Indigenous engagement and consultation;
- other matters of regulatory importance; and
- the proposed licence amendment.

3.1 Applicability of the *Impact Assessment Act*

33. In coming to its decision, the Commission is first required to determine whether any requirements under the IAA apply to the application and whether an impact assessment is required.

34. Pursuant to the IAA and the *Physical Activities Regulations*[31] made under it, impact assessments are to be conducted in respect of projects identified as having the greatest potential for adverse environmental effects in areas of federal jurisdiction. The proposed licence amendment does not include activities listed in the IAA *Physical Activities Regulations* that require an impact assessment or that meet the definition of a project on federal lands.

35. The Commission concludes that there is no requirement under the IAA for an impact assessment to be completed. The Commission is also satisfied that there are no other applicable requirements of the IAA to be addressed in this matter[32].

3.2 Assessment of the Licence Amendment Application

36. OPG is seeking authorization from the Commission to extend the commercial operation of PNGS Units 5 – 8 from until December 31, 2024 to until December 31, 2026, and to increase the Units 5 – 8 pressure tubes operating limit from up to 295,000 EFPH to up to 305,000 EFPH. In its application, OPG confirmed that it plans to shut down PNGS Units 1 and 4 by December 31, 2024. The Commission examined the sufficiency of OPG's licence application (CMD 24-H5.1 and CMD 24-H5.1A) and the adequacy of the information submitted, as required by the NSCA, the *General Nuclear Safety and Control Regulations*[33] (GNSCR), the CINFR, and other applicable regulations made under the NSCA.

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[30] SCAs are the technical topics used by CNSC staff across all regulated facilities and activities to assess, evaluate, review, verify and report on regulatory requirements and performance.
[31] SOR/2019-285.
[32] The IAA can impose other requirements on federal authorities in respect of authorizing projects that are not designated as requiring an impact assessment, including projects that are to be carried out on federal lands, or projects outside of Canada. This licence amendment does not engage any such applicable IAA requirements.
[33] SOR/2000-202.

37. Section 6 of the GNSCR provides that an application for the amendment of a licence shall contain:

a) a description of the amendment, revocation or replacement and of the measures that will be taken and the methods and procedures that will be used to implement it;
b) a statement identifying the changes in the information contained in the most recent application for the licence;
c) a description of the nuclear substances, land, areas, buildings, structures, components, equipment and systems that will be affected by the amendment, revocation or replacement and of the manner in which they will be affected; and
d) the proposed starting date and the expected completion date of any modification encompassed by the application.

38. Section 7 of the GNSCR provides that an application for a licence or for the renewal, suspension in whole or in part, amendment, revocation or replacement of a licence may incorporate by reference any information that is included in a valid, expired or revoked licence.

39. In support of its application, OPG conducted a reassessment of the periodic safety review (PSR) for PNGS Units 5 – 8, described in section 4.1.3.1 of CMD 24-H5.1 and section 3.0 of CMD 24-5.1A, and a condition assessment of PNGS Units 5 – 8 major components, described in section 4.1.3.2 of CMD 24-H5.1 and section 5.0 of CMD 24-5.1A. Appendix B of CMD 24-H5.1 contains a list of new regulatory and CSA documents published since the current licence was renewed in 2018 that OPG currently meets, grouped into the relevant SCA. Section 7 of CMD 24-H5.1A contains a list of new regulatory and CSA documents that OPG plans to implement before the end of 2025.

40. In section B.1 of CMD 24-H5, CNSC staff submitted a summary of its assessment of OPG's application. CNSC staff submitted that OPG's application met regulatory requirements for a licence amendment application.

41. The Commission concludes that OPG's licence amendment application includes the necessary information for an application for a licence amendment. The Commission finds that OPG has provided sufficient information for the Commission to come to a decision on this matter.

3.3 Summary of Views of Hearing Participants

42. In order to determine whether to allow the extension of the commercial operation of PNGS Units 5 – 8 to December 31, 2026, and whether to allow the increase of the PNGS Units 5 – 8 pressure tubes operating limit to a maximum of 305,000 EFPH, the Commission gave careful consideration to all submissions and perspectives received, in accordance with its mandate and the scope of this hearing. The Commission appreciates the efforts and contributions of all hearing participants.

43. In section 7.0 of CMD 24-H5.1, OPG provided a summary of its position with respect to its application:

- OPG continues to meet applicable regulatory requirements;
- OPG's PSR2-B findings reaffirmed that the current plant design, operation, processes and management system at PNGS Units 5 – 8 would ensure continued safe operation to the end of 2026;
- OPG's assessments of the fitness for service of the PNGS Units 5 – 8 structures, systems and components (SSCs), including the fuel channels, assured that the SSCs would be fit for service until the end of 2026; and
- OPG's assessment of the operation of fuel channels on PNGS Units 5 – 8 assured their fitness for service for up to 305,000 EFPH.

44. CNSC staff recommended that the Commission amend PROL-48.01/2028 to authorize OPG to operate PNGS Units 5 – 8 until December 31, 2026, up to an operating limit of 305,000 EFPH. In section 7 of CMD 24-H5, CNSC staff submitted the following:

- how OPG adequately demonstrated, in accordance with regulatory requirements, that the major components at PNGS Units 5 – 8, including fuel channels, feeders, and steam generators, would be fit for service until the end of 2026;
- how OPG adequately demonstrated, in accordance with regulatory requirements, that the fuel channels for PNGS Units 5 – 8 would be fit for service to up to 305,000 EFPH; and
- that CNSC staff was therefore satisfied that OPG would remain qualified to carry on the activities authorized in PROL-48.01/2028 and would continue to make adequate provision for the protection of persons and the environment.

45. A total of 54 interventions were received including 17 oral submissions and 37 written submissions (Appendix A – List of Intervenors). Of the 54 interventions, 41 were in support of OPG's application. Thirteen intervenors raised issues and concerns with respect to the following:

- the age of the PNGS, including the irradiated fuel bays (IFBs)
- the fitness for service of the major components at the PNGS
  - degradation and readiness of pressure tubes and calandria tubes
  - degradation of carbon steel feeders
  - readiness of spacers tested up to 264,000 EFPH
- OPG's performance under the security SCA during the current licence period
- the sufficiency of safety analysis performed by OPG and risk of severe accidents at the PNGS
- waste management, including
  - the capacity of the PNGS IFBs
  - additional waste generated from the proposed extended operation
- the adequacy of emergency management measures for the PNGS
- environmental protection, including impacts of climate change on the PNGS

46. The following issues were raised regarding consultation and engagement with Indigenous Nations and communities:

- the duty to consult
- the adequacy of assessment of impacts to Aboriginal and treaty rights
- the adequacy of engagement
- recommendations on approaches for engagement, including
  - co-developing a framework for effective engagement, consultation and reconciliation
  - adopting a collaborative planning approach for safety and emergency response planning, as well as the development of new environmental risk assessments (ERAs)
  - implementation of a Cumulative Effects Assessment that encompasses all facilities within the Treaty Territory of the Williams Treaties First Nations
- comments and recommendations regarding the implementation of the *United Nations Declaration on the Rights of Indigenous Peoples Act*[34], including
  - obtaining consent from Indigenous Nations and communities for projects concerning the PNGS site, prior to authorizing activities
  - implementing action plan measure 34 of the United Nations Declaration on the Rights of Indigenous Peoples Act Action Plan[35]
- historical impacts from the original siting and development of the PNGS

47. The issues raised by hearing participants, and their bearing on the deliberations of the Commission, are discussed in the appropriate subject-specific sections of this *Record of Decision*. Issues raised by Indigenous Nations and communities are detailed in section 3.6 of this *Record of Decision*.

3.4 OPG's Periodic Safety Review Reassessment

48. A PSR is a comprehensive assessment of the design and operation of a nuclear power plant (NPP) that deals with the cumulative effects of aging, modifications, operating experience, technical developments and siting factors, and aims at ensuring a high level of safety throughout the operating life of the plant. CNSC regulatory document[36] REGDOC-2.3.3, *Periodic Safety Reviews*[37] sets out the requirements for the conduct of a PSR for a NPP. OPG previously completed a PSR to support its licence renewal application for the PNGS in 2018 (referred to as PSR2), to support that PNGS Units 5 – 8 would operate until the end of 2024.

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[34] S.C. 2001, c. 14.
[35] Department of Justice Canada, *United Nations Declaration on the Rights of Indigenous Peoples Act Action Plan*, retrieved from the Department of Justice – Government of Canada's website: https://www.justice.gc.ca/eng/declaration/ap-pa/ah/index.html, 2023.
[36] CNSC regulatory documents are typically referred to as REGDOCs
[37] CNSC Regulatory Document, REGDOC-2.3.3, *Periodic Safety Review*, version 1, CNSC, April 2015.

49. Licence condition 15.1 of PROL-48.01/2028 requires that OPG implement the Integrated Implementation Plan (IIP). Under the licensing basis requirements for this licence condition, for any of the PNGS units to operate beyond December 31, 2024, OPG had to perform and complete a reassessment of the continued validity of the PSR results by or before June 30, 2023, in accordance with the detailed requirements under this licence condition. Under its licensing basis, OPG had to provide a reassessment of the impact of operation beyond 2024, as well as request CNSC acceptance of potential new or revised actions in the PNGS PSR2 IIP. Licence condition 15.4 of PROL-48.01/2028 requires OPG to implement and maintain plans for the end of commercial operations of all Pickering units.

50. In support of its application to extend the commercial operation of PNGS Units 5 – 8 until December 31, 2026, OPG submitted a reassessment of PSR2 (referred to as PSR2-B), per requirements under the licensing basis for licence conditions 15.1 and 15.4 of PROL-48.01/2028.

51. In section 4.1.3.1 of CMD 24-H5.1 and section 3.0 of CMD 24-H5.1A, OPG provided the Commission with information on its PSR2-B along with results from the Global Issues Gap Assessment Report, the Global Assessment Report (GAR), and the IIP. In its submission, OPG explained that PSR2-B is an amendment to PSR2 and was performed to reassess the time-dependent elements of PSR2 and the continuing applicability of the PSR2 basis. OPG reported that it had completed all PSR2 IIP actions and the results were supportive of continued safe and reliable commercial operation of the PNGS until the end of 2024.

52. In section 4.1.3.1.3 of CMD 24-H5.1, OPG explained its reassessment methodology including the scope of review. In section 4.1.3.1.4 of CMD 24-H5.1, OPG reported on gaps identified by PSR2-B and results from the PNGS PSR2-B GAR. OPG submitted that PSR2-B:

- did not identify any new gaps, except for updating time-dependent actions to include new versions of the standards not currently included in the licence
- confirmed that the current plant design, operation, processes and management system were supportive of continued safe operation of PNGS Units 5 – 8 to the end of 2026.

53. In section 4.1.3.1.5 of CMD 24-H5.1, OPG reported on its IIP, which captures the resolution actions to address the identified gaps. A total of 19 IIP assignments associated with 13 resolution actions were reported, mostly related to the aging management strategies for the extended operation. In section 3.0 of CMD 24-H5.1A, OPG reported on its current progress of the IIP assignments and the plan to complete all IIP commitments before December 31, 2024, as required by the IIP.

54. In section 3 of CMD 24-H5, CNSC staff submitted that OPG's design, operation, processes, and management system would support continued safe operation of PNGS Units 5 – 8 until the end of 2026. CNSC staff submitted its assessment of OPG's PSR2-B and IIP covering the following specific areas:

- CNSC staff review of the gap assessment
- CNSC staff review of the GAR
- CNSC staff acceptance of the IIP
- CNSC staff oversight of the implementation of the IIP

55. In section 3.2 of CMD 24-H5, CNSC staff described OPG's development of the 13 proposed resolution statements that were carried over to the IIP. CNSC staff submitted that:

- OPG's Global Issue Gap Assessment Report met CNSC regulatory requirements
- the identified gaps were appropriate for further assessments
- OPG's GAR met CNSC regulatory requirements

56. In sections 3.2 to 3.4 of CMD 24-H5, CNSC staff described its assessment of OPG's IIP, which was submitted in May 2023. CNSC staff submitted that the IIP met CNSC requirements. CNSC staff explained that OPG developed a total of 32 IIP commitments based on the requirements under REGDOC-2.3.3, guidance in International Atomic Energy Agency (IAEA) Safety Standards Series No. SSG-25, *Periodic Safety Review for Nuclear Power Plants*,[38] expectations in CSA Group Standard CSA N290.18, *Periodic safety review for nuclear power plants*,[39] and current Canadian experience. CNSC staff noted that OPG planned to complete all 32 PSR2-B IIP commitments by December 31, 2024.

57. During the hearing, OPG noted that 27 out of 32 IIP commitments had been completed. CNSC staff submitted that it would report to the Commission on the status of the execution of the IIP commitments as part of its annual *Regulatory Oversight Report (ROR) on Nuclear Power Generating Sites (NPGS)*.

58. During the hearing, the Commission enquired about the IIP execution and verification process. OPG explained that upon completion of any IIP action item, OPG would inform CNSC staff, who would perform a comprehensive review. CNSC staff added that depending on the review result, either the action would be closed or CNSC staff would seek additional information from OPG.[40]

[38] IAEA Safety Standards Series No. SSG-25, *Periodic Safety Review for Nuclear Power Plants*, March 2013.
[39] CSA Group Standard, CSA N290.18, *Periodic safety review for nuclear power plants*, 2017.
[40] Transcript, June 19, 2024, pages 118-120.

59. The Commission asked for more information concerning the IIP action items that were scheduled for completion by December 31, 2024. OPG noted that the outstanding items were mainly associated with the aging models for the heat transport systems (HTS). OPG confirmed that the outstanding action items were on track to be completed by end of 2024. CNSC staff noted its satisfaction with OPG's completed work to date.[41]

60. Based on the information on record for this hearing, the Commission is satisfied that OPG met the requirements of licence conditions 15.1 and 15.4 for the purpose of this application. The Commission finds that OPG's PSR2-B is acceptable and based on the requirements under REGDOC-2.3.3. The Commission notes that OPG is expected to complete all PSR2-B IIP commitments by December 31, 2024. The Commission's consideration of OPG's measures to support the continued operation of PNGS Units 5 – 8 to the end of 2026 is further discussed in section 3.5 of this *Record of Decision*.

3.5 OPG's Safety and Control Measures with Respect to the Safety and Control Areas

61. The Commission examined OPG's proposed safety and control measures for the application to extend the commercial operation of PNGS Units 5 – 8 until December 31, 2026, and increase the operating limit for PNGS Units 5 – 8 to up to a maximum of 305,000 EFPH. As part of its consideration of the application, the Commission evaluated OPG's performance in all 14 safety and control areas (SCAs) over the current licence period, based on information gathered from 2018 to the end of 2023.

62. OPG submitted that the PNGS would continue to operate in a safe manner within the bounds of its operating policies and operational safety requirements. OPG noted that its existing programs and processes would support the safe operation of PNGS Units 5 – 8 until the end of 2026 and that no changes were necessary. In section 6 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG reported its performance in all 14 SCAs along with planned improvements to support the extended operation until the end of 2026.

63. CNSC staff submitted that OPG's existing programs and processes continued to meet the applicable regulatory requirements and would support commercial operation of PNGS Units 5 – 8 until December 31, 2026, with no changes required. In section 4 of CMD 24-H5, CNSC staff submitted its assessment of OPG's programs across each SCA. CNSC staff reported that OPG's performance was "satisfactory" in all SCAs over the licence period, with the exception of the security SCA, which was "below expectations" for 2021 and 2022.

[41] Transcript, June 19, 2024, page 121.

3.5.1 Management System

64. The management system SCA covers the framework that establishes the processes and programs required to ensure that OPG achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture. Licence condition 1.1 of PROL-48.01/2028 requires OPG to implement and maintain a management system.

65. Paragraph 3(d) of the CINFR states that a licence application for a Class I nuclear facility shall contain "the proposed management system for the activity to be licensed, including measures to promote and support safety culture." Section 3 of the GNSCR contains requirements that form the basis of a management system.

66. REGDOC-2.1.2, *Safety Culture*[42] sets out requirements and guidance for fostering a healthy safety culture and conducting safety culture assessments. CSA Group Standard N286, *Management System Requirements for Nuclear Facilities*[43] provides an overall management framework and direction to develop and implement sound management practices and controls for the licensing basis.

67. In section 6 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its management system, work undertaken during the current licence period, and planned future work, including the following areas:

- Management system
- Staffing management
- Safety culture
- Operating experience (OPEX)
- Materials management
- Records management
- Business planning
- Business continuity

68. OPG reported that no major changes would be required to its programs and processes related to the management system SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026 and that these programs and processes continued to comply with the licensing basis requirements in PROL-48.01/2028.

69. In section 4.1 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the management system SCA covering the following specific areas:

- Management system
- Organization

[42] CNSC Regulatory Document, REGDOC-2.1.2, *Safety Culture*, April 2018.
[43] CSA Group Standard, CSA N286-12, *Management System Requirements for Nuclear Facilities,* 2012 (R2022).

- Performance assessment, improvement, and management review
- OPEX, problem identification and resolution
- Change management
- Safety culture
- Configuration management
- Records management
- Supply and contractor management
- Business continuity

CNSC staff confirmed that OPG's programs within the management system SCA met regulatory requirements and would be adequate to support continued commercial operation of PNGS Units 5 – 8 until the end of 2026. CNSC staff noted that 2 IIP commitments from the PNGS PSR2-B IIP were related to the management system SCA.[44]

70. CNSC staff reported that, during the current licence period, it conducted compliance verification activities to evaluate OPG's performance in this SCA. CNSC staff noted that findings of non-compliance made by CNSC staff were of low or negligible safety significance, and that OPG had implemented satisfactory corrective actions to address them.

71. The Commission asked if OPG would have any challenges related to the management of personnel, supply chain and equipment shared between PNGS-A and PNGS-B, given the planned shutdown of PNGS-A by the end of 2024. Representatives from OPG explained that OPG's safe storage plan for PNGS-A Units 1 and 4 included staffing transition plans and considerations for interfacing common systems shared with Units 5 – 8. CNSC staff noted that it was satisfied with how OPG was managing the challenges so far, and that OPG had completed a similar transition for Units 2 and 3. In addition, CNSC staff confirmed that it would have enough resources for the transition. [45]

72. Based on the information on record for this hearing, the Commission concludes that OPG has an appropriate management system in place to adequately carry out the activities that would be authorized by the proposed licence amendment. The Commission finds that OPG's existing programs and processes related to the management system SCA meet regulatory requirements, including CSA N286-12 and REGDOC-2.1.2, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

73. The Commission notes that OPG is expected to complete the 2 PSR2-B IIP commitments related to the management system SCA by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet its commitments.

[44] Both were actions around the implementation of an engineering change related to failure detection for emergency water system reactor building water level measurement.
[45] Transcript, June 20, 2024, pages 144-147.

3.5.2 Human Performance

74. The human performance management SCA covers activities that enable effective human performance through the development and implementation of processes that ensure that a sufficient number of workers are in all relevant job areas and have the necessary knowledge, skills, procedures, and tools in place to safely carry out their duties.

75. OPG's current PROL-48.01/2028 includes 4 licence conditions related to the human performance management SCA:

- Licence condition 2.1 requires OPG to implement and maintain a human performance program;
- Licence condition 2.2 requires OPG to implement and maintain the minimum shift complement and control room staffing for the nuclear facility;
- Licence condition 2.3 requires OPG to implement and maintain training programs; and
- Licence condition 2.4 requires OPG to implement and maintain certification programs in accordance with REGDOC-2.2.3, Volume III.

76. Paragraph 12(1)(a) of the GNSCR requires the licensee to ensure that there are sufficient qualified workers to carry on the licensed activity safely and in accordance with the NSCA, its regulations and the licence, whereas paragraph 12(1)(b) indicates that the licensee must train workers to carry on the licensed activity in accordance with the Act, its regulations and the licence.

77. Paragraph 3(d.1) of the CINFR provides that a licence application must include information about the proposed human performance program for the activity to be licensed, including the measures to ensure workers' fitness for duty, whereas paragraphs 6(m) and 6(n) indicate that a licence application for a licence for a Class I nuclear facility must include information on the proposed responsibilities, qualification requirements, training program, and measures for the requalification of workers, as well as on the results obtained through the application of the program for the recruitment, training and qualification of workers related to the operation and maintenance of the nuclear facility.

78. The following CNSC REGDOCS include requirements and guidance relevant to the human performance management SCA:

- REGDOC-2.2.2, *Personnel Training*, Version 2[46] sets out requirements and guidance for the analysis, design, development, implementation, evaluation, documentation and management of training at nuclear facilities within Canada, including the essential principles and elements of an effective training system;

[46] CNSC Regulatory Document, REGDOC-2.2.2, *Performance Training*, Version 2, December 2016.

- REGDOC-2.2.3, *Personnel Certification*, *Volume III: Certification of Persons Working at Nuclear Power Plants*[47] sets out requirements aiming to ensure that persons seeking a certification by the CNSC for a position referred to in the licence of a NPP are qualified to carry out the duties of that position in accordance with the NSCA and its regulations; and
- REGDOC-2.2.4, *Fitness for Duty* (Volumes I, II, and III)[48,49,50] set out the requirements and guidance for managing worker fitness for duty in relation to fatigue, alcohol and drug use, and medical, physical, and psychological fitness, at high security sites.

79. In section 6.2 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its human performance management program, along with current improvements and initiatives, including the following areas:

- Human performance management
- Personnel training
- Certification
- Initial certification and requalification
- Fitness for duty

OPG submitted that its programs and processes continue to comply with the licensing basis requirements in PROL-48.01/2028. OPG added that no major changes would be required to its programs and processes related to the human performance management SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

80. In section 4.2 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the human performance management SCA covering the following specific areas:

- Human performance program
- Personnel training
- Personnel certification
- Work organization and job design
- Fitness for duty

CNSC staff assessed that OPG's programs within the human performance management SCA met regulatory requirements and would be adequate to support continued commercial operation until the end of 2026. CNSC staff noted that there were no commitments from the PNGS PSR2-B IIP related to the human performance management SCA.

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[47] CNSC Regulatory Document, REGDOC-2.2.3, *Personnel Certification*, *Volume III: Certification of Persons Working at Nuclear Power Plants*, September 2019.
[48] CNSC Regulatory Document, REGDOC-2.2.4, *Fitness for Duty, Managing Worker Fatigue*, March 2017.
[49] CNSC Regulatory Document, REGDOC-2.2.4, *Fitness for Duty, Volume II: Managing Alcohol and Drug Use*, Version 3, January 2021.
[50] CNSC Regulatory Document, REGDOC-2.2.4, *Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, Psychological Fitness*, September 2018.

81. CNSC staff reported that, through compliance verification activities, it made findings of non-compliance during the current licence period, including OPG's report of a small number of minimum shift complement violations to the CNSC. CNSC staff noted that the findings were of low or negligible safety significance. CNSC staff added that OPG had implemented satisfactory corrective actions to address these findings.

82. The Commission asked if OPG had concerns around staffing, given the planned shut down of all PNGS units. A representative from OPG responded that OPG had confirmed that there would be enough qualified and trained staff to support continued operations until the end of 2026 and briefly explained OPG's staffing management on this matter. The Commission then asked CNSC staff how often it verifies and validates that there would be enough licensed professionals to operate the plant. CNSC staff explained that the staffing levels were verified and reported quarterly and confirmed its satisfaction with the current number of certified staff at OPG.[51]

83. The Commission enquired about OPG's initial certification program, which was canceled in 2021. A representative from OPG reported that the program had been revived and the first group had started the general training, with the first certification examination taking place on May 17, 2024.[52]

84. In CMD 24-H5.1A[53], OPG reported on an appeal filed by the Power Workers Union against the decision from the Federal Court of Canada around random alcohol and drug testing for workers in safety critical positions at high-security nuclear facilities.[54] Asked for an update on this matter, a representative from OPG responded that the case was still with the Court and OPG was not aware of a decision date. OPG did not anticipate this issue having any impact on the requested extended operation of PNGS Units 5 – 8.[55]

85. Based on the information on record as described above, the Commission concludes that OPG has adequate measures in place to manage human performance for the conduct of the licensed activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the human performance management SCA meet requirements, including REGDOCs 2.2.2, 2.2.3 and 2.2.4, to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.3 Operating Performance

86. The operating performance SCA includes an overall review of the conduct of the licensed activities and the activities that enable effective performance. The operating performance program is expected to establish safe, uniform, and efficient operating

[51] Transcript, June 19, 2024, pages 141-144.
[52] Transcript, June 20, 2024, pages 131-132.
[53] OPG submission, CMD 24-H5.1A, pages 11-12.
[54] Per REGDOC-2.2.4, *Fitness for Duty, Volume II: Managing Alcohol and Drug Use*
[55] Transcript, June 20, 2024, pages 132-133.

practices within the nuclear facility, under all operating conditions, and provides the ability to ensure the facility is operated in accordance with the licensing basis. This includes the documents that define the safe operating envelope (SOE) of the facility.

87. OPG's current PROL-48.01/2028 includes 3 licence conditions related to the operating performance SCA:

- Licence condition 3.1 requires OPG to implement and maintain an operations program, which includes a set of operating limits;
- Licence condition 3.2 states that OPG shall not restart a reactor after a serious process failure without the prior written approval of the Commission, or the prior written consent of a person authorized by the Commission; and
- Licence condition 3.3 requires OPG to notify and report in accordance with REGDOC-3.1.1.

88. Paragraph 6(d) of the CINFR provides that an application for a licence to operate a Class I nuclear facility must include information on the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility.

89. The following CNSC REGDOCs include requirements and guidance relevant to the operating performance SCA:

- REGDOC-2.3.2, *Accident Management*[56] sets out requirements and guidance for the development, implementation and validation of integrated accident management for reactor facilities;
- REGDOC-2.3.3, *Periodic Safety Reviews* sets out the requirements for the conduct of a periodic safety review for an NPP; and
- REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*[57] sets out requirements and guidance for reports and notifications that licensees of nuclear power plants must submit to the CNSC.

In addition, CSA N290.15, *Requirements for the Safe Operating Envelope of Nuclear Power Plants*[58] sets out requirements and guidance for the SOE of NPPs.

In section 6.3 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its operating performance program, along with current improvements and initiatives, including the following areas:

- Operations
- Plant status control
- Work protection

[56] CNSC Regulatory Document, REGDOC-2.3.2, *Accident Management*, Version 2, September 2015.
[57] CNSC Regulatory Document, REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, Version 2, April 2016.
[58] CSA Group Standard, CSA N290.15, *Requirements for the safe operating envelope of nuclear power plants,* 2010 (R2015)

- Reactivity management
- Outage management performance

90. OPG submitted that its programs and processes related to the operating performance SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes to its programs and processes would be required to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

91. In section 4.3 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the operating performance SCA covering the following specific areas:

- Conduct of licensed activity
- Procedures
- Reporting and trending
- Outage management performance
- Safe operating envelope
- Severe accident management and recovery
- Accident management and recovery

CNSC staff assessed that OPG's programs within the operating performance SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff added that there were no commitments from the PNGS PSR2-B IIP related to the operating performance SCA.

92. CNSC staff reported that, during a 2023 inspection, CNSC staff made findings of non-compliance related to the SOE. CNSC staff noted that it was satisfied with OPG's corrective actions. The Commission asked for more information on OPG's non-compliance regarding the SOE.[59] CNSC staff explained that the non-compliance finding was associated with a notification failure and confirmed that OPG had addressed the non-compliance.[60]

93. The Commission asked OPG to explain the reasons for OPG's recent improvements in operating performance, such as longer operation without outages. A representative from OPG explained OPG's improved safety performance and plant performance, emphasizing the importance of safety culture and the focus on plant reliability and outage planning.[61]

94. In its intervention (CMD 24-H5.39), Nordion (Canada) Inc. provided information regarding the role of the PNGS in the Cobalt-60 (Co-60) supply chain. Nordion expressed concerns that the potential shutdown of PNGS Units 5 – 8 at the end of 2024 could cause a supply gap. Asked for more information, a Nordion representative

[59] CNSC staff submission, CMD 24-H5, page 27.
[60] Transcript, June 20, 2024, pages 133-134.
[61] Transcript, June 19, 2024, pages 135-137.

responded that the Co-60 supply from the PNGS was significant, and that extended operations would provide additional time to onboard new Co-60 suppliers. A representative from OPG confirmed that Co-59 rods had been inserted into the cores of PNGS Units 5 – 8 for the production of Co-60, and noted that, if OPG's application were denied, the usefulness of the rods at the end of operations would need to be assessed.[62]

95. Based on the information on record as described above, the Commission concludes that OPG's existing programs and processes related to the operating performance SCA meet regulatory requirements, including CSA N290.15, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.4 Safety Analysis

96. The safety analysis SCA covers maintenance of the safety analyses that support the overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of the licensed activity or the operation of a facility. Safety analysis also considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. Licence condition 4.1 of PROL-48.01/2028 requires OPG to implement and maintain a safety analysis program.

97. Paragraph 6(i) of the CINFR provides that an application for a licence to operate a Class I nuclear facility must include a final safety analysis report demonstrating the adequacy of the design of the nuclear facility.

98. The following CNSC REGDOCs include requirements and guidance relevant to the safety analysis SCA:

- REGDOC-2.4.1, *Deterministic Safety Analysis*[63] sets out requirements and guidance for the preparation and presentation of a safety analysis that demonstrates the safety of a nuclear facility;
- REGDOC-2.4.2, *Probabilistic Safety Assessment (PSA) for Nuclear Power Plants*[64] sets out requirements for a licensee to conduct a probabilistic safety assessment[65] (PSA) for an NPP; and
- REGDOC-3.1.1 sets out reporting requirements for NPPs, including providing updated safety reports at least every 5 years, or when directed by the CNSC.

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[62] Transcript, June 20, 2024, pages 77-81.
[63] CNSC Regulatory Document, REGDOC-2.4.1, *Deterministic Safety Analysis*, May 2014.
[64] CNSC Regulatory Document, REGDOC-2.4.2, *Probabilistic Safety Assessment (PSA) for Nuclear Power Plants*, May 2014.
[65] A probabilistic safety assessment is a comprehensive and integrated assessment of the safety of a facility. The PSA considers the probability, progression and consequences of equipment failures or transient conditions to derive numerical estimates that provide a consistent measure of the safety of the facility.

In addition, CSA N286.7, *Quality assurance of analytical, scientific and design computer programs for nuclear power plants*[66] specifies expectations applicable to the development, modification, maintenance, and use of computer programs in analytical, scientific, and design applications during any phase of the nuclear plant lifecycle.

99. In section 6.4 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its safety analysis programs, along with current improvements and initiatives, including the following areas:

- Deterministic safety analysis
- Probabilistic safety assessment (PSA)

100. OPG reported that no major changes would be required to its programs and processes related to the safety analysis SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026 and that these programs and processes continued to comply with the licensing basis requirements in PROL-48.01/2028.

101. In section 4.4 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the safety analysis SCA covering the following specific areas:

- Deterministic safety analysis
- Hazard analysis
- Probabilistic safety analysis
- Criticality safety
- Severe accident analysis
- Management of safety issues, including research and development (R&D) programs

102. CNSC staff assessed that OPG's programs within the safety analysis SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff noted that 5 commitments from the PNGS PSR2-B IIP were found to be related to the safety analysis SCA, specifically related to updating the heat transport system aging safety analysis models and performing the required safety analysis of events most impacted by aging, including small break loss of coolant accident, loss of flow, and neutron overpower protection. CNSC staff added that OPG's revised implementation plan for REGDOC-2.4.1 during the 2022-2024 period identified additional activities to be undertaken, to comply with the requirements of REGDOC-2.4.1. OPG was expected to submit another revised implementation plan to the CNSC by December 2024

[66] CSA Group Standard, CSA N286.7, *Quality assurance of analytical, scientific and design computer programs for nuclear power plants,* 1999 [R2012].

103. No major concerns were identified by CNSC staff with respect to safety analysis during the current licence period. CNSC staff noted that OPG had provided acceptable corrective action plans to address CNSC staff findings from inspections, including an update of the probable maximum precipitation estimate for the next iteration of the PSA update, and improvement plans related to the high wind PSA.

104. The Commission asked for more information concerning regulatory requirements regarding safety analysis for severe accidents. CNSC staff responded that applications must be supported by preliminary and final safety analyses. CNSC staff explained the type of analysis required in consideration of both design basis accidents and severe accidents. CNSC staff noted that there is no prescribed list of events, which are specific to a reactor design. Regarding the definition of severe accidents, CNSC staff explained that severe accidents are those that involve a substantial failure of nuclear fuel. CNSC staff noted that the rupture of a single fuel channel is not considered to be a severe accident but rather a design basis event considered in the design.[67]

105. The Commission enquired about OPG's defence in depth structure and how it would be utilized under emergency situations. Representatives from OPG explained OPG's defence in depth features included in its design, operating procedures, training and routine testing, including considerations of both design basis and beyond design basis accidents. In support of this licence amendment application, OPG reported that a defence in depth assessment had been performed as part of its PSR, to confirm that the design, construction, operation of PNGS Units 5 – 8 would support continued commercial operation until the end of 2026. CNSC staff added that all modern requirements were fully expected to be complied by OPG regardless of the aging of the PNGS. CNSC staff explained the regulatory requirements around defence in depth and confirmed that OPG met these requirements.[68]

106. The Canadian Nuclear Association (CMD 24-H5.43) highlighted a number of safety enhancements completed by OPG related to hydrogen recombiners.[69] The Commission asked if these safety enhancements had been implemented in PNGS Units 5 – 8. A representative from OPG confirmed that the implementation of specific safety enhancements, the passive hydrogen recombiners, the addition of the emergency equipment and severe accident management guidelines, among other safety significant improvements, had been completed on PNGS Units 5 – 8.[70]

107. Sunil Nijhawan (CMD 24-H5.46), raised concerns around hydrogen recombiners not being optimized for deuterium. Asked for more information, a representative from OPG responded that, based on R&D completed, it was found that the difference between hydrogen and deuterium was negligible for the recombiners.[71]

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[67] Transcript, June 19, 2024, pages 174-175.
[68] Transcript, June 20, 2024, pages 39-50.
[69] CMD 24-H5.43, page 3.
[70] Transcript, June 20, 2024, page 101.
[71] Transcript, June 19, 2024, page 182.

108. In its submission, CNSC staff reported on PSR2-B IIP commitments related to safety analysis of events most impacted by aging, including neutron overpower protection.[72] The Commission asked for more information on this subject. CNSC staff explained that although all analyses are regularly examined for updates, certain events are more affected by aging, predominantly because of geometry changes such as fuel channel creep and elongation. CNSC staff noted that such events would be assessed at a certain frequency to account for aging.[73]

109. The Commission asked if the last update of the PSA for the PNGS completed in 2022 accounted for continuous operation of Units 5 – 8 until the end of 2026. CNSC staff explained that the PSA gets updated every 5 years and confirmed that the 2022 update of the PSA is valid until 2026.[74]

110. Based on the information on the record as described above, the Commission concludes that OPG has an adequate safety analysis program in place to accommodate for the licensed activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the safety analysis SCA meet regulatory requirements, including REGDOCs 2.4.2 and 3.1.1, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

111. The Commission notes that OPG is expected to submit a revised implementation plan for REGDOC-2.4.1 by December 2024, and complete the 5 PSR2-B IIP commitments related to the safety analysis SCA by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet these commitments.

3.5.5 Physical Design

112. The physical design SCA relates to activities that impact the ability of SSCs to meet and maintain their design basis, with new information arising over time and changes occurring in the external environment. The design basis is the range of conditions and events taken explicitly into account in the design of a nuclear facility, according to established criteria, such that the facility can withstand this range without exceeding authorized limits.

113. OPG's current PROL-48.01/2028 includes 3 licence conditions related to the physical design SCA:

- Licence condition 5.1 requires OPG to implement and maintain a design program;
- Licence condition 5.2 requires OPG to implement and maintain a pressure boundary program and have in place a formal agreement with an Authorized Inspection Agency; and

[72] CNSC staff submission, CMD 24-H5, page 32.
[73] Transcript, June 20, 2024, page 135.
[74] Transcript, June 20, 2024, pages 135-137.

- Licence condition 5.3 requires OPG to implement and maintain an equipment and structure qualification program.

114. Paragraph 3(1)(d) of the GNSCR requires that a licence application shall contain a description of any nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence. Paragraphs 3(a) and 3(b) of the CINFR indicate that a licence application for a Class I nuclear facility must include a description of the site of the activity to be licensed, as well as plans showing the location, perimeter, areas, structures and systems of the nuclear facility. Paragraphs 6(a) and 6(b) of the CINFR provide that an application for a licence to operate a Class I nuclear facility includes a description of the structures, systems and equipment at the nuclear facility, including their design and their design operating conditions.

115. The following CSA Group standards include requirements and guidance relevant to the physical design SCA:

- CSA N285.0, *General requirements for pressure-retaining systems and components in CANDU nuclear power plants*[75] specifies the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination, and inspection of pressure-retaining and containment systems, components, and supports at a NPP;
- CSA N290.12, *Human Factors in Design for Nuclear Power Plants*[76] provides guidance on human factors in design for existing and new NPPs;
- CSA N290.13, *Environmental qualification of equipment for CANDU nuclear power plants*[77] specifies the requirements for an environmental qualification (EQ) program for CANDU NPPs; and
- CSA N293, *Fire protection for CANDU nuclear power plants*[78] provides the minimum fire protection requirements for the design, construction, commissioning, operation, and decommissioning of NPPs.

116. In section 6.5 of CMD 24-H5.1, OPG provided the Commission with information on its physical design program, along with current improvements and initiatives, including the following areas:

- Fuel program
- Pressure boundary program
- EQ

[75] CSA Group Standard, CSA N285.0, *General requirements for pressure-retaining systems and components in CANDU nuclear power plants*, 2008.
[76] CSA Group Standard, CSA N290.12, *Human Factors in Design for Nuclear Power Plants,* 2014 (R2019).
[77] CSA Group Standard, CSA N290.13, *Environmental qualification of equipment for CANDU nuclear power plants*, 2005 (R2015)
[78] CSA Group Standard, CSA N293, *Fire protection for CANDU nuclear power plants*, 2012 (including the 2017 update).

117. OPG submitted that its physical design program continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes would be required to its programs and processes related to the physical design SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

118. In section 4.5 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the physical design SCA covering the following specific areas:

- Design governance
- Facility design
- Structure design
- System design
- Component design

119. CNSC staff assessed that OPG's programs within the physical design SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff noted that 2 commitments from the PNGS PSR2-B IIP were related to the physical design SCA, specifically the reassessment of existing equipment qualification assessments to support extended commercial operation of PNGS Units 5 – 8 until the end of 2026. CNSC staff added that OPG was expected to complete these actions in 2024.

120. Based on the information on record, as described above, the Commission concludes that OPG has an adequate physical design program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the physical design SCA meet regulatory requirements, including CSA N285.0 and CSA 290.13, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

121. The Commission notes that OPG is expected to complete the 2 PSR2-B IIP commitments related to the physical design SCA by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet this commitment.

3.5.6 Fitness for Service

122. The fitness for service SCA covers activities that are performed to ensure that SSCs remain effective over time and are available to perform their intended design functions upon request. Licence condition 6.1 of PROL-48.01/2028 requires OPG to implement and maintain a fitness for service program.

123. Paragraph 6(d) of the CINFR requires that an application for a licence to operate a Class I nuclear facility contain the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility.

124. The following CNSC REGDOCS include requirements and guidance relevant to the fitness for service SCA:

- REGDOC-2.6.1, *Reliability Programs for Nuclear Power Plants*[79] sets out the requirements for the development and implementation of a reliability program for a nuclear power plant in Canada;
- REGDOC-2.6.2, *Maintenance Programs for Nuclear Power Plants*[80] sets out guidance and requirements for maintaining an effective maintenance program for a nuclear power plant; and
- REGDOC-2.6.3, *Aging Management*[81] sets out guidance and the requirements for managing aging of SSCs for reactor facilities.

125. The following CSA Group standards include requirements and guidance relevant to the fitness for service SCA:

- CSA N285.4, *Periodic inspection of CANDU nuclear power plant components*[82] defines the requirements for the periodic inspection of pressure retaining systems, components, and supports that form part of a CANDU NPP;[83]
- CSA N285.5, *Periodic inspection of CANDU nuclear power plant containment components*[84] provides rules for the periodic inspection of containment components in CANDU NPPs;[85]
- CSA N285.8, *Technical requirements for in-service inspection evaluation of zirconium alloy in pressure tubes in CANDU reactors*[86] specifies the technical requirements to ensure the structural integrity of zirconium alloy pressure tubes in operating CANDU reactors;
- CSA N287.1, *General requirements for concrete containment structures for nuclear power plants*[87] provides general requirements for concrete containment structures for NPPs designated as class containment; and
- CSA N287.7, *In-service examination and testing requirements for concrete containment structures for nuclear power plants*[88] provides requirements for in-service examinations of concrete containment structures in an NPP.

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[79] CNSC Regulatory Document, REGDOC-2.6.1, *Reliability Programs for Nuclear Power Plants*, August 2017.
[80] CNSC Regulatory Document, REGDOC-2.6.2, *Maintenance Programs for Nuclear Power Plants*, August 2017.
[81] CNSC Regulatory Document, REGDOC-2.6.3, *Aging Management*, March 2014.
[82] CSA Group Standard, CSA N285.4, *Periodic inspection of CANDU nuclear power plant components*, 2005.
[83] OPG is currently working towards complete implementation of the 2019 edition of N285.4, see Appendix A of CMD 24-H5.1A.
[84] CSA Group Standard, CSA N285.5, *Periodic inspection of CANDU nuclear power plant containment components*, 2008.
[85] OPG is currently working towards full implementation of the 2022 edition of CSA N285.5, see Appendix A of CMD 24-H5.1A.
[86] CSA Group Standard, CSA N285.8, *Technical requirements for in-service inspection evaluation of zirconium alloy in pressure tubes in CANDU reactors*, 2015 (R2020, including Update No. 1).
[87] CSA Group Standard, CSA N287.1, *General requirements for concrete containment structures for nuclear power plants*, 2014 (R2019).
[88] CSA Group Standard, CSA N287.7, *In-service examination and testing requirements for concrete containment structures for nuclear power plants,* 2017 (R2022).

126. In section 6.6 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its fitness for service programs, along with current improvements and initiatives, including the following areas:

- Equipment reliability
- Major components and life cycle management
- Aging management
- Periodic inspection and testing
- Structural integrity
- Chemistry control
- Maintenance
- Fuel handling reliability
- Maintenance backlog

In addition, in section 4.1.3.2 of CMD 24-H5.1 and section 5.0 of CMD 24-H5.1A, OPG provided the Commission with information focusing on fitness for service of fuel channels.

127. OPG submitted that its programs and processes related to the fitness for service SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes would be required to its programs and processes to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

128. In section 4.6 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the fitness for service SCA covering the following specific areas:

- Equipment fitness for service / equipment performance (reliability)
- Maintenance
- Aging management
- Periodic inspection and testing
- Structural integrity
- Chemistry control

129. CNSC staff noted that OPG follows an approximately 30-month outage cycle for each reactor unit. CNSC staff explained that each reactor is shut down for regular inspection and maintenance activities to confirm that structural integrity margins are maintained and to confirm the fitness for service of the inspected SSCs, including:

- fuel channels
- steam generators
- feeders
- concrete and containment components

130. CNSC staff provided information on the ongoing monitoring, inspection and testing of degradation mechanisms affecting units 5 – 8 fuel channels, including:

- fuel channel elongation, resulting from operation over time
- elevated hydrogen equivalent concentration ([Heq])
- pressure tube flaw assessments for the detection and evaluation of flaws in pressure tubes
- pressure tube fracture toughness
- contact between pressure tubes and calandria tubes, which may lead to the formation of a brittle zirconium hydride blister at the contact location and eventually may lead to pressure tube failure
- the mobility of loose-fitting spacers in the annulus gap between the pressure tube and calandria tube that prevent contact between the two tubes
- the continued fitness for service of tight-fitting spacers
- contact between the calandria tube and adjacent liquid injection shutdown system (LISS) nozzles, which may lead to fretting of the calandria tube and/or LISS nozzle

131. CNSC staff assessed that OPG's programs within the fitness for service SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff reported that 17 IIP commitments from the PNGS PSR2-B IIP were related to the fitness for service SCA, specifically regarding the continued demonstration of fitness for service of reactor components and structures, fuel channels (including spacers), feeders, and steam generators, and updating the fuel channel related periodic inspection plans. CNSC staff added that OPG was expected to complete these actions by the end of 2024.

132. CNSC staff reported that it expected OPG to augment its major component condition assessments, particularly for pressure tubes, through additional inspections, research and development activities, and analysis to further understand and control aging mechanisms. CNSC staff explained that, in 2022, OPG conducted a vacuum building outage VBO where CNSC staff made findings of non-compliance of low safety significance. CNSC staff noted that OPG has corrective actions to improve the containment performance.

133. With respect to the discovery of elevated [Heq] in CANDU pressure tubes in extended operation in 2021, CNSC staff reported that OPG had demonstrated that, for PNGS Units 5 – 8, there were no known active degradation mechanisms for the formation of flaws that were at risk for crack initiation within the pressure tube regions of interest. CNSC staff added that OPG had committed to participate in an industry wide R&D program to investigate the elevated [Heq] issue and to develop an appropriate model to predict [Heq] in the vicinity of the inlet and outlet burnish mark.

134. CNSC staff noted that, under licence condition 15.3, OPG's current licence requires that, before hydrogen equivalent concentrations exceed 120 ppm, the licensee shall demonstrate that pressure tube fracture toughness will be sufficient for safe operation beyond 120 ppm. CNSC staff submitted that, to reflect advancements in understanding related to pressure tube behaviour following the identified elevated [Heq] in pressure tubes in extended operation, the existing licence condition 15.3 would no longer be applicable. CNSC staff further noted that, the fitness for service criteria established under licence condition 6.1 cannot be confirmed in the regions of interest of pressure tubes. CNSC staff recommended that the Commission remove licence condition 15.3 and add a new licence condition 6.2 to require OPG to implement and maintain an enhanced fitness for service program for fuel channels in extended operation. With the proposed licence amendment, CNSC staff recommended that the Commission authorize OPG to operate PGNS Units 5 – 8 pressure tubes up to 305,000 EFPH. The proposed licence amendment is further discussed in section 3.8 of this *Record of Decision*.

135. The Commission asked for further explanation of the relationship between aging mechanisms and EFPH, and whether it was linear. A representative from OPG explained that while some of the aging mechanisms resemble a linear relationship, some mechanisms, such as [Heq], do not. The OPG representative noted that OPG relies on inspections, monitoring, backwards- and forward-looking modelling, and R&D to assure fitness for service through to the next operating interval.[89]

136. The Commission asked about the status of OPG's tests related to EFPH and [Heq]. Representatives from OPG reported on the status and the plan for OPG's fracture toughness model and the [Heq] roadmap. OPG representatives noted that it provides semi-annual updates to CNSC staff on the progress of the work. CNSC staff confirmed that it was satisfied with OPG's current work including thoroughness of the scope, current progress, and appropriateness of the models.[90]

137. Kinectrics (CMD 24-H5.40, CMD 24-H5.40A), a company that provides design and technical services to OPG, provided information regarding its analysis to support OPG's application. The Commission enquired about the evaluation of the sensitivity of finite element analysis on the impacts of elevated [Heq]. A representative from Kinectrics explained the comment and disposition process being followed. An OPG representative noted that OPG was providing regular updates to CNSC staff around findings from R&D activities related to [Heq]. CNSC staff noted that it would continue to provide updates to the Commission on all activities related to [Heq], including research work. The Commission was satisfied with the responses.[91]

[89] Transcript, June 19, 2024, pages 137-140.
[90] Transcript, June 19, 2024, pages 176-181.
[91] Transcript, June 20, 2024, pages 88-91.

138. The Mississaugas of Scugog Island First Nation (MSIFN) (CMD 24-H5.49) expressed concerns around spacers in PNGS Units 5 – 8 not being tested beyond 264,000 EFPH. CNSC staff and a representative from OPG provided information concerning the tests completed to date along with ongoing work. CNSC staff noted that, based on when they were put in service, the maximum operating period for the spacers would be 283,000 EFPH rather than 305,000 EFPH. The OPG representative noted that the PNGS Units 5 – 8 spacers had been authorized up to 268,000 EFPH, which would take until June 2025. CNSC staff noted that, once OPG was ready to demonstrate operation of spacers beyond 268,000 EFPH, CNSC staff would reassess their fitness for service before granting authorization.[92]

139. Paul Sedran, RESD Inc. (CMD 24-H5.35) submitted that with ovalisation of the calandria tube at spacer locations, partial nip-up of the spacer and calandria tube would occur earlier than nip-up, although not expected to be an issue for fitness for service of fuel channels. The Commission asked if this partial nip-up had been considered in OPG's modeling. A representative from OPG responded that OPG had considered ovalisation assessed partial nip-up. The OPG representative noted that both tight- and loose-fitting spacers had been assessed and that no nip-up was anticipated until well beyond the target operating life. The OPG representative added that OPG had also completed a significant number of inspections to validate the condition of pressure tubes.

140. The Commission asked for more information concerning loose- and tight-fitting spacers. A representative from OPG explained that initially, loose-fitting spacers had been installed which were later found to be moving, and so it was decided to replace the loose-fitting spacers with tight-fitting spacers during retubing to reduce maintenance outages. The representative from OPG confirmed that the number of spacers was not related to the aging process or the [Heq] pickup.[93]

141. The Commission asked for more information concerning the movement of spacers. A representative from OPG explained that only the loose-fitting spacers move, as a result of vibration of the fuel channels. The OPG representative noted that the fuel channels' susceptibility to spacer movement primarily depends on spacer loading, which is impacted by pressure tube deformation.[94]

142. Asked about OPG's aging management program, particularly with respect to the primary HTS, a representative from OPG explained its aging management approach for both major components and other components, which had been incorporated into OPG's governance in response to one of the IIP action items. The OPG representative noted that, for major components, OPG developed lifecycle management plans in compliance with the requirements and expectations of REGDOC-2.6.3, *Aging Management*.[95] The OPG representative explained that the lifecycle management plans

[92] Transcript, June 19, 2024, pages 76-79.
[93] Transcript, June 19, 2024, pages 160-163.
[94] Transcript, June 20, 2024, page 143.
[95] CNSC Regulatory Document, REGDOC-2.6.3, *Aging Management*, version 1, March 2014.

forecast the required inspection, maintenance, research and development activities nominally for the next 10 years with an additional 2 years incorporated as part of one of the IIP action items which had been accepted and closed by the CNSC. For components that are not major components, condition assessment reports were generated.[96]

143. The Commission enquired about CNSC staff's evaluation of the aging management of the primary HTS. CNSC staff explained that OPG's aging management programs were guided by requirements in REGDOC-2.6.3 and expectations in relevant CSA Group standards for the components being inspected. CNSC staff explained that it followed a PLAN-DO-CHECK-ACT process during its review and noted that OPG currently exceeded the minimum inspection expectation for the primary HTS per the CSA Group standards. CNSC staff noted that it was satisfied with OPG's progress in recent years, particularly regarding the maintenance backlog.

144. The Commission further enquired about testing to validate the condition of equipment. CNSC staff responded that OPG takes [Heq] measurements where physical scape samples of pressure tubes are sent for analysis. In addition, OPG conducts full volumetric inspections including inspection for any fuel channel creep, increase in channel length, diametric expansion of the fuel channels, sag in-between spacers, and flaws within the fuel channels. CNSC staff noted that Canada has a well-regarded aging management program for NPPs, which is benchmarked internationally, and that the CNSC dedicates significant resources to ensure fitness for service, verifying that aging aspects meet all requirements.[97]

145. The Commission asked how OPG determines whether to replace a pressure tube. A representative from OPG explained that if a pressure tube was found through inspection or predicted to not be meeting the acceptance criteria per CSA standards, then OPG would undertake maintenance activities or replace the pressure tube. The OPG representative noted that the typical outage duration for a pressure tube replacement was around 30 days.[98]

146. The Commission asked how many outages were planned for the PNGS from 2024 to 2026. A representative from OPG responded that 2 single-unit outages were planned in 2024, 1 single-unit outage was planned in 2025 and 1 single-unit outage was planned 2026.[99]

147. Sunil Nijhawan (CMD 24-H5.46) expressed concerns regarding the potential risk of erosion and corrosion induced thinning in feeders and pressure tubes. A representative from OPG explained that erosion and corrosion are dealt with through OPG's periodic inspection program, its backwards- and forward-looking modelling, and R&D

[96] Transcript, June 19, 2024, pages 121-123.
[97] Transcript, June 19, 2024, pages 123-125.
[98] Transcript, June 20, 2024, pages 33-36.
[99] Transcript, June 20, 2024, page 39.

activities, and are factored into heat transport aging and components conditions. The Commission asked whether OPG performs any tests to verify its models. A representative from OPG explained that OPG performs non-destructive tests, along with deterministic and probabilistic assessments to validate the models.

148. Referring to the intervention by Canadians for Nuclear Energy (CMD 24-H5.48), the Commission asked for further information regarding the shrinking of the gaps between the LISS nozzles and the calandria tube, as time passes. A representative from OPG responded that OPG had been performing gap inspections and had come up with a strategy to implement a mechanism to reduce the tension on the nozzles which would increase the gaps. The OPG representative noted that the sufficiency of the gaps would be verified through ongoing inspections. The OPG representative noted that this activity had been completed on PNGS Unit 6 and was planned for PNGS Unit 5 in an upcoming outage. The Commission asked how many LISS nozzles there are for each calandria tube and if there is a specific location inside the calandria tube where the nozzles are more prone to have a reduced gap. A representative from OPG responded that there are 6 LISS nozzles in each core, adding up to a total of 24 nozzles across the site. There were certain areas with a smaller gap, mainly contributed by more sagging towards the higher power channels.[100]

149. With the aging of the PNGS, the Commission asked if any of the pressure tubes would be off bearing by the end of 2026. A representative from OPG responded that no pressure tubes were anticipated to be off bearing before the end of 2026. The representative provided a brief description of the fuel channel mechanism at the PNGS, OPG's routine surveillance and a campaign undertaken at each unit to ensure that no fuel channels would be off bearing.[101]

150. The Commission further enquired about planned work around pressure tube repositioning. A representative from OPG responded that all large-scale shifting, with contingency added, had been completed at PNGS Units 5 – 8 to demonstrate fitness for service until the end of 2026, according to the scope identified under OPG's aging management program. The OPG representative noted that there might be small amount of shifting required in upcoming outages defined through its life cycle management process, and that OPG has the resources and tooling to complete this work.[102]

151. The Commission enquired about the vapour quality at the outlet of the pressure tubes in the region of interest, with the concern that the coolant may be on the verge of boiling, causing fluent use vibration, which could continuously impact the top of the pressure tube where [Heq] cumulates. A representative from OPG elaborated on the region of interest and noted that there is no mechanism to form flaws in this region.[103]

[100] Transcript, June 19, 2024, pages 192-195, 198-199.
[101] Transcript, June 19, 2024, pages 181-182.
[102] Transcript, June 20, 2024, pages 37-39.
[103] Transcript, June 19, 2024, pages 195-197.

152. Asked about its timing for full implementation of CSA N285.4:19 and CSA N285.5:22, a representative from OPG reported that OPG had completed gap analyses against the new versions of the standards, and that no significant gaps impacting the operation or fitness for service were found. The OPG representative noted that the transition plan that captures the target completion time is included in the revised periodic inspection plan submitted as part of PSR2-B IIP actions. CNSC staff confirmed that OPG's implementation plan for CSA N285.4:19 and CSA N285.5:22 was acceptable.[104]

153. CANDU Owners Group (COG) (CMD 24-H5.10) provided information about joint projects to support the PNGS. The Commission asked about the specific projects that would support PNGS Units 5 – 8 in the upcoming 2 years. A representative from COG described the relevant R&D programs run by COG, including the fuel channel life management program and programs related to operations, safety and licensing areas. The COG representative also highlighted work around reducing radiation exposures.[105]

154. The Commission asked how the fuel handling equipment reliability index in OPG's supplementary submission[106] is defined, and whether OPG is confident that the fuel handling machines would be available in 2025 and 2026. Representatives from OPG explained that while OPG has a formal definition for the index, the purpose is to show reliability performance of the fuel handling machines. OPG was confident that the fuel handling machines would continue with good performance with the ongoing work around fuel handling.[107]

155. Regarding CNSC staff's submission on OPG's vacuum building and pressure relief duct leakage rate testing results (conducted during the VBO) exceeding its operational target,[108] the Commission asked if any additional leakage rate testing had been conducted since the VBO and if the corrective actions taken by OPG showed improvements. A representative from OPG responded that the testing results completed during the VBO met regulatory and code requirements. OPG had completed additional repairs and observed improvements from its online testing. OPG would provide updates to CNSC staff on an annual basis.[109]

156. Based on the information on record as described above, the Commission concludes that OPG has adequate fitness for service measures in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the fitness for service SCA meet regulatory requirements, including REGDOCs 2.6.1, 2.6.2 and 2.6.3, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026. The Commission is satisfied that OPG has adequate measures to augment the major

[104] Transcript, June 20, 2024, pages 91-93.
[105] Transcript, June 20, 2024, pages 110-114.
[106] OPG submission, CMD 24-H5.1A, page 15.
[107] Transcript, June 20, 2024, pages 118-125.
[108] CNSC staff submission, CMD 24-H5, page 46.
[109] Transcript, June 20, 2024, pages 148-149.

component condition assessments, particularly for pressure tubes, through additional inspections, research and development activities, and analysis to further understand and control aging mechanisms.

157. The Commission notes that OPG is expected to complete the 17 PSR2-B IIP commitments related to the fitness for service SCA by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet this commitment.

3.5.7 Radiation Protection

158. Radiation protection includes measures for protecting the health and safety of persons from hazards associated with ionizing radiation. Radiation protection ensures that contamination levels and radiation doses received by individuals are monitored, controlled, and maintained as low as reasonably achievable (ALARA), while taking into consideration social and economic factors. Licence condition 7.1 of PROL-48.01/2028 requires OPG to implement and maintain a radiation protection program.

159. Section 4 of the *Radiation Protection Regulations*[110] requires licensees to implement a radiation protection program. As part of this program, licensees must keep effective and equivalent doses received by, and committed to, persons ALARA, taking into account social and economic factors, and ascertain the quantity and concentration of any nuclear substance released as a result of the licensed activity. Paragraphs 6(e) and 6(h) of the CINFR require that an application for a licence to operate a Class I nuclear facility contains the proposed procedures for handling, storing, loading and transporting nuclear substances and hazardous substances, as well as the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measure that will be taken to prevent or mitigate those effects.

160. In section 6.7 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its radiation protection program, along with current improvements and initiatives, including the following areas:

- Application of ALARA
- Worker dose control
- Radiological hazard control

161. OPG submitted that its radiation protection programs and processes continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes would be required to its programs and processes related to the radiation protection SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

[110] SOR/2000-203.

162. In section 4.7 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the radiation protection SCA covering the following specific areas:

- Application of ALARA
- Worker dose control
- Radiation protection program performance
- Radiological hazard control

163. CNSC staff assessed that OPG's programs within the radiation protection SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff added that no commitments from the PNGS PSR2-B IIP are related to the radiation protection SCA.

164. CNSC staff submitted that no worker had received a radiation dose in excess of regulatory dose limits at the PNGS over the current licence period. CNSC staff noted that OPG had reported one action level[111] exceedance for a dose to a Nuclear Energy Worker, which was well below the regulatory limit[112], and that OPG had implemented corrective actions to prevent a recurrence. CNSC staff reported that findings of non-compliance from a December 2022 inspection were of low or negligible safety significance. CNSC staff added that the findings were regarding the governance support documentation related to OPG's ALARA plan, and that OPG had appropriate corrective actions planned.

165. Based on the information on record, as described above, the Commission concludes that OPG has a radiation protection program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the radiation protection SCA meet regulatory requirements, including the *Radiation Protection Regulations*, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.8 Conventional Health and Safety

166. The conventional health and safety SCA covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment. A conventional health and safety program manages conventional (non-radiological) workplace safety hazards and ensures compliance with applicable labour codes. Licence condition 8.1 of PROL-48.01/2028 requires OPG to implement and maintain a conventional health and safety program.

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[111] Under the *Radiation Protection Regulations*, an action level means a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's radiation protection program and triggers a requirement for specific action to be taken.

[112] The regulatory dose limits for nuclear energy workers are 50 mSv in any one year and 100 mSv in a five-year dosimetry period. The regulatory dose limit for members of the public is 1 mSv in one calendar year.

167. Paragraph 3(f) of the CINFR provides that a licence application for a Class I nuclear facility must include a description of the proposed worker health and safety policies and procedures.

168. In section 6.8 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its conventional health and safety program, along with current improvements and initiatives, including its performance, practices and awareness. OPG submitted that its programs and processes continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes would be required to its programs and processes related to the conventional health and safety SCA to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

169. In section 4.8 of CMD 24-H5, CNSC staff reported that OPG's programs within the conventional health and safety SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff submitted that pursuant to regulations made under the *Canada Labour Code*,[113] OPG's conventional health and safety program is regulated by the Ontario Ministry of Labour, Immigration, Training and Skills Development in accordance with the *Ontario Occupational Health and Safety Act*[114] (OHSA) and the *Ontario Labour Relations Act*[115]. CNSC staff added that no commitments from the PNGS PSR2-B IIP are related to the conventional health and safety SCA.

170. CNSC staff reported that, during the licence period, it observed safe work practices during inspections and other activities at the PNGS. CNSC staff noted that findings of non-compliance in the conventional health and safety SCA were of low or negligible safety significance, and that OPG had taken appropriate corrective actions to address the findings.

171. Based on the information on record, as described above, the Commission concludes that OPG has an adequate conventional health and safety program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the conventional health and safety SCA meet regulatory requirements and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.9 Environmental Protection

172. The Environmental Protection SCA covers programs that identify, control, and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities. These programs include effluent

[113] R.S.C., 1985, c. L-2.
[114] R.S.O. 1990, c. O.1.
[115] S.O. 1995, c. 1, Sched. A.

and emission control, environmental monitoring, and estimated doses to the public. Licence condition 9.1 of PROL-48.01/2028 requires OPG to implement and maintain an environmental protection program, including a set of action levels.

173. In accordance with the NSCA, licensees are required to make adequate provision for the protection of the environment. Paragraphs 12(1)(c) and (f) of the GNSCR require each licensee to take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment. The *Radiation Protection Regulations* prescribe dose limits for the public, which, pursuant to subsection 1(3), are 1 mSv per calendar year.

174. REGDOC-2.9.1, *Environmental Principles, Assessments, and Protection Measures*[116] describes the CNSC's principles of environmental protection, the scope of an environmental review, the roles and responsibilities associated with an environmental review, as well as the CNSC's requirements and guidance for developing environmental protection measures, including an ERA where required.

175. The following CSA Group N288 series of standards provides requirements and guidance for the environmental management of nuclear facilities:

- CSA N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*[117] provides guidelines for calculating derived release limits;[118]
- CSA N288.3.4, *Performance testing of nuclear air-cleaning systems at nuclear facilities*[119] provides guidelines around the design, implementation, and management of a nuclear air-cleaning system testing program;
- CSA N288.4, *Environmental monitoring programs at nuclear facilities and uranium mines and mills*[120] provides guidance on the design and operation of environmental monitoring programs for nuclear facilities;
- CSA N288.5, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*[121] provides guidelines on the design, implementation, and management of an effluent monitoring program;

[116] CNSC Regulatory Document, REGDOC-2.9.1, *Environmental Principles, Assessments and Protection Measures*, Version 1.2, April 2017.
[117] CSA Group Standard, CSA N288.1, *Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities*, 2014 (R2019).
[118] OPG plans to implement the 2020 edition of N288.1 by December 31, 2024. See section 7.0 of CMD 24-H5.1A.
[119] CSA Group Standard, CSA N288.3.4, *Performance testing of nuclear air-cleaning systems at nuclear facilities*, 2013 (R2022).
[120] CSA Group Standard, CSA N288.4, *Environmental monitoring programs at nuclear facilities and uranium mines and mills,* 2019.
[121] CSA Group Standard, CSA N288.5, *Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills*, 2011 (R2021).

- CSA N288.6, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills*[122] provides guidance on ERAs for Class I nuclear facilities and uranium mines and mills;
- CSA N288.7, *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills*[123] provides requirements and guidance for the design, implementation, and management of a groundwater protection program to manage risks posed to the environment or the health and safety of humans and non-human biota from groundwater; and
- CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities*[124] provides requirements and guidance to develop and implement action levels for releases from a final discharge point at nuclear facilities.

176. Health Canada's *Guidelines for Drinking Water Quality - Summary Tables*[125] and the *Ontario Drinking Water Quality Standards*[126] provide guidelines for radiological parameters for drinking water.

177. In section 6.9 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its environmental protection program, along with current improvements and initiatives, including the following areas:

- Environmental management system (EMS)
- Effluent and emissions controls
- Spill management program
- Fish impingement and entrainment
- ERA
- Predictive effects assessment
- Biodiversity and wildlife habitat council

178. OPG submitted that its programs and processes related to the environmental protection SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG noted that its EMS was registered and certified under the International Organization for Standardization (ISO) standard 14001, *Environmental management systems – Requirements with guidance for use*[127]. OPG reported that no major changes to its programs would be required to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

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[122] CSA Group Standard, CSA N288.6, *Environmental risk assessments at Class I nuclear facilities and uranium mines and mills,* 2012 (R2017).
[123] CSA Group Standard, CSA N288.7, *Groundwater protection programs at Class I nuclear facilities and uranium mines and mills,* 2015 (R2020).
[124] CSA Group Standard, CSA N288.8, *Establishing and implementing action levels for releases to the environment from nuclear facilities*, 2017 (R2022).
[125] *Guidelines for Drinking Water Quality - Summary Tables*, Health Canada, September 2022.
[126] O. Reg. 169/03: *Ontario Drinking Water Quality Standards*.
[127] ISO Standard, ISO 14001, *Environmental management systems – Requirements with guidance for use*, 2015 (R2021).

179. OPG noted that it planned to implement the 2020 edition of CSA N288.1 by the end of 2024. OPG also reported that it was undertaking an entrainment study in 2024 and 2025 in support of its intent to file an application for technical amendments to its *Fisheries Act* authorization with Fisheries and Oceans Canada. OPG noted that it would update impingement and entrainment losses and offset gains using revised metrics.

180. In section 4.9 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the environmental protection SCA covering the following specific areas:

- EMS
- Effluent and emissions control (releases)
- Assessment and monitoring
- ERA
- Protection of people

181. CNSC staff reported that OPG's programs within the environmental protection SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff further reported that no commitments from the PNGS PSR2-B IIP were related to the environmental protection SCA.

182. CNSC staff confirmed that OPG continued to implement and maintain effective environmental protection measures to adequately protect the environment and the health of people living in and around the PNGS over the current licence period. CNSC staff submitted that radiological and non-radiological releases from the PNGS were below established limits and posed no risks to human health and the environment. CNSC staff noted that although OPG's 2022 ERA report was satisfactory, CNSC staff had recommended further improvements to the ERA. CNSC staff further noted that in response, OPG had committed to continue to engage local Indigenous Nations and communities prior to and during the preparation of the next ERA to incorporate Indigenous Knowledge and perspectives.

183. The Commission asked OPG about its plans to incorporate Indigenous Knowledge and perspectives into its current environmental monitoring practices, considering that the next update of ERA would be in 2027. A representative from OPG described the Indigenous engagement activities OPG had undertaken in preparing the 2022 ERA, including to establish valued ecosystem components for the ERA. The OPG representative added the 2022 ERA was completed using a western science perspective, and that OPG was working to incorporate Indigenous receptors and world views into future assessments. The OPG representative noted that OPG did not anticipate any impacts to Indigenous Nations and communities from the requested extended operations.

184. The Commission asked for more information concerning fish impingement and entrainment. A representative from OPG responded that OPG was expecting to take in less cooling water in the upcoming 2 years as fewer reactor units would be running, and thus the existing entrainment offsets established as part of its current *Fisheries Act* authorization would be adequate.[128] A representative from Fisheries and Oceans Canada confirmed that OPG's current *Fisheries Act* authorization for the PNGS is valid until December 2028.[129]

185. Based on the information on record, as described above, the Commission concludes that OPG has an environmental protection program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the environmental protection SCA meet regulatory requirements, including REGDOC-2.9.1 and CSA N288-series standards, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

186. The Commission takes note of OPG's plan to implement the 2020 edition of CSA N288.1 by the end of 2024. The Commission directs CNSC staff to inform the Commission on the status of OPG's implementation plan in 2025.

3.5.10 Emergency Management and Fire Protection

187. The emergency management and fire protection SCA covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions.

188. OPG's current PROL-48.01/2028 includes 2 licence conditions related to the emergency management and fire protection SCA:

- Licence condition 10.1 of PROL-48.01/2028 requires OPG to implement and maintain an emergency preparedness program; and
- Licence condition 10.2 requires OPG to implement and maintain a fire protection program.

189. Paragraph 12(1)(c) of the GNSCR states that the licensee shall "take all reasonable precautions to protect the environment, preserve the health and safety of persons and maintain the security of nuclear facilities and of nuclear substances", while paragraph 12(1)(f) states that the licensee shall "take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment of the licensed activity."

[128] Transcript, June 20, 2024, pages 141-142.
[129] Transcript, June 20, 2024, pages 138-141.

190. Paragraph 6(k) of the CINFR requires that an application for a licence to operate a Class I nuclear facility must include information on the licensee's proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security.

191. REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, Version 2[130] sets out the CNSC's requirements and guidance for emergency preparedness and applies to licensees and licence applicants for Class I nuclear facilities. CSA N293, *Fire protection for CANDU nuclear power plants*[131] provides the minimum fire protection requirements for the design, construction, commissioning, operation, and decommissioning of nuclear power plants.[132]

192. In section 6.10 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its emergency management and fire protection programs, along with current improvements and initiatives. OPG submitted that its programs and processes related to the emergency management and fire protection SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes were required to its programs and processes to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

193. In section 4.10 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the emergency management and fire protection SCA covering the following specific areas:

- Nuclear emergency preparedness and response
- Conventional emergency preparedness and response
- Fire emergency preparedness and response

194. CNSC staff noted that the off-site emergency response planning for the PNGS was managed according to the *Provincial Nuclear Emergency Response Plan (PNERP) Master Plan*[133] and the *PNERP Implementing Plan for the Pickering Nuclear Generating Station*[134], maintained by Emergency Management Ontario (EMO).

195. CNSC staff assessed that OPG's programs within the emergency management and fire protection SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff reported that 6 commitments from the PNGS PSR2-B IIP were related to the emergency management and fire

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[130] CNSC Regulatory Document, REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*, Version 2, February 2016.
[131] CSA Group Standard, CSA N293, *Fire protection for CANDU nuclear power plants*, 2012 (R2022).
[132] In 2023, OPG implemented Update No. 1 to the 2012 edition of CSA N293 at the PNGS.
[133] *Provincial Nuclear Emergency Response Plan (PNERP) Master Plan*, Ministry of Community Safety and Correctional Services – Office of the Fire Marshal and Emergency Management, 2017.
[134] *PNERP Implementing Plan for the Pickering Nuclear Generating Station*, Ministry of Community Safety and Correctional Services – Office of the Fire Marshal and Emergency Management, 2019.

protection SCA, specifically regarding the review of OPG's existing governance to align with the 2015 edition of the *National Building Code of Canada*[135] and the 2015 edition of the *National Fire Code of Canada*[136]. In addition, OPG planned to construct a new fire hall within the protected area of the PNGS by the end of 2024.

196. CNSC staff further reported that OPG had conducted 2 full scale emergency exercises during the current licence period, 1 in 2020, 1 in 2023. CNSC staff made findings of non-compliance in 2023, related to the maintenance of fire emergency response equipment and the utilization of fire fighting equipment and tools. CNSC staff submitted that OPG had implemented corrective action plans to address these non-compliances, including ensuring that all equipment inspections would be verified by separate staff.

197. Mississaugas of Scugog Island First Nation (CMD 24-H5.49, CMD 24-H5.49A) raised concerns that it had not been consulted on the PNERP in the past, but noted that it was progressively becoming more engaged in the current review process. Metis Nation of Ontario (MNO) Region 8 (24-H5.36) also expressed an interest in providing input on the PNERP. The Commission enquired about the status of the PNERP. A representative from EMO responded that while the current PNERP remains effective, a technical working group was close to finalizing a new technical study and a planning basis for a revised PNERP, consistent with the requirements of REGDOC-2.10.1, CSA N1600, *General requirements for nuclear emergency management programs*,[137] and IAEA Safety Standards Series No. GSR Part 7, *Preparedness and Response for a Nuclear or Radiological Emergency*.[138] The EMO representative noted that the study results would inform policy decisions around the size and preparedness requirements for the emergency planning zones, including the plan for distribution of potassium iodide (KI). The EMO representative added that EMP was engaged in a consultative process with Indigenous Nations and communities with territory in or in close proximity to licensed CNSC facilities.[139]

198. The Commission asked for more information concerning emergency response tactics in addition to the strategy under the PNERP. A representative from OPG responded that OPG conducts drills and exercises. The OPG representative added that an IAEA Emergency Preparedness Review (EPREV) team had conducted an independent review focusing on Canada's implementation of the IAEA safety standards on emergency preparedness and response programs.[140]

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[135] National Research Council Canada, *National Building Code of Canada*, 2015.
[136] National Research Council Canada, *National Fire Code of Canada*, 2015.
[137] CSA Group Standard, CSA N1600, *General requirements for nuclear emergency management programs*, 2021.
[138] IAEA Safety Standards Series No. GSR Part 7, Preparedness and Response for a Nuclear or Radiological Emergency, 2015.
[139] Transcript, June 19, 2024, pages 81-85.
[140] Transcript, June 19, 2024, pages 95-100.

199. The Commission asked CNSC staff and OPG for more information concerning the exercise completed in September 2023. CNSC staff responded that it was satisfied with OPG's performance during the exercise. A representative from OPG added further details around the exercise and noted the successful completion of all primary objectives, along with various lessons learned.[141]

200. In its intervention (CMD 24-H5.29),[142] Slovenian Home Association raised concerns around its members being unaware of actions to take under a nuclear emergency. The Commission asked OPG to explain its approach in communicating with communities with respect to emergency preparedness. A representative from OPG described OPG's involvement in public education, awareness campaigns, public engagement events and efforts to distribute information through various channels. The OPG representative also noted that OPG had heard the intervenor's concerns and had taken action to reach out to provide information.[143]

201. Based on the information on record, as described above, the Commission concludes that OPG has adequate emergency management and fire protection programs in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the emergency management and fire protection SCA meet regulatory requirements, including REGDOC-2.10.1, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

202. The Commission notes that OPG is expected to complete the 6 PSR2-B IIP commitments related to the emergency management and fire protection SCA by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet this commitment.

3.5.11 Waste Management

203. The waste management SCA covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. It also covers the planning for decommissioning.

204. OPG's current PROL-48.01/2028 includes 2 licence conditions related to the waste management SCA:

- Licence condition 11.1 requires OPG to implement and maintain a waste management program; and
- Licence condition 11.2 requires OPG to implement and maintain a decommissioning plan.

[141] Transcript, June 19, 2024, pages 102-105.
[142] CMD 24-H5.29, page 4.
[143] Transcript, June 19, 2024, pages 115-118.

205. Paragraph 3(1)(j) of the GNSCR provides that a licence application must include the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including wastes that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste. Paragraph 3(k) of the CINFR also requires that a licence application contain the proposed plan for the decommissioning of the nuclear facility or of the site.

206. The following CNSC REGDOCs include requirements and guidance relevant to the waste management SCA:

- REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*[144] sets out the CNSC's requirements and guidance for managing radioactive waste; and
- REGDOC-3.1.1 sets out reporting requirements for NPPs including periodic reports on safety performance indicators, including low- and intermediate-level radioactive solid waste generated at the PNGS.

207. The following CSA Group standards include requirements and guidance relevant to the waste management SCA:

- CSA N292.0, *General principles for the management of radioactive waste and irradiated fuel*[145] specifies common requirements for the management of radioactive waste and irradiated fuel from generation to storage or disposal;
- CSA N292.2, *Interim dry storage of irradiated fuel*[146] specifies requirements for the site selection, design, construction, commissioning, operation, and planning for decommissioning of dry storage systems;
- CSA N292.3, *Management of low- and intermediate-level radioactive waste*[147] specifies requirements for the management of radioactive waste to protect the health and safety of people, physical security, and the environment; and
- CSA N294, *Decommissioning of facilities containing nuclear substances*[148] provides direction on defining, planning, and executing decommissioning work.

208. In section 6.11 of CMD 24-H5.1, OPG provided the Commission with information on its waste management program, along with current improvements and initiatives, including the following areas:

- Waste minimization, segregation and characterization
- Decommissioning plans

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[144] CNSC Regulatory Document, REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*, January 2021.
[145] CSA Group Standard, CSA N292.0, *General principles for the management of radioactive waste and irradiated fuel*, 2019 (R2024).
[146] CSA Group Standard, CSA N292.2, *Interim dry storage of irradiated fuel*, 2013 (R2023).
[147] CSA Group Standard, CSA N292.3, *Management of low- and intermediate-level radioactive waste*, 2014 (R2024).
[148] CSA Group Standard, CSA N294, *Decommissioning of facilities containing nuclear substances*, 2019.

OPG submitted that its programs and processes related to the waste management SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes to its programs would be required to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

209. OPG reported its current development of a Polychlorinated Biphenyl (PCB) phase-out plan and its progress on removal of equipment containing PCBs, per *PCB Regulations*[149] which require removal of equipment containing PCBs by December 31, 2025. OPG also reported on its Preliminary Decommissioning Plan (PDP), which had been updated and presented to the Commission in 2022. This PDP was planned in accordance with CSA N294:19, CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*[150], and CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*[151]. OPG noted that it planned to implement REGDOC-2.11.2 in the next scheduled update of the PDP, as part of the planned 5-year PDP update cycle.

210. In section 4.11 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the waste management SCA covering the following specific areas:

- Waste characterization
- Waste minimization
- Waste management practices
- Decommissioning plans

211. CNSC staff assessed that OPG's programs within the waste management SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff noted that no commitments from the PNGS PSR2-B IIP were related to the waste management SCA.

212. CNSC staff reported that, for the PDP updated in 2022, OPG had assumed the continued operation of PNGS Units 5 – 8 until the end of 2025. CNSC staff was satisfied with OPG's proposed plan to include the operation of PNGS Units 5 – 8 to until December 31, 2026, in the next PDP revision. CNSC staff also confirmed that the proposed extended commercial operation of PNGS Units 5 – 8 would not affect the operation of OPG's Pickering Waste Management Facility (PWMF), which is separately licensed under a Class IB Waste Facility Operating Licence.

213. CNSC staff submitted that during the current licence period, findings of non-compliance from inspections of OPG's waste management program at the PNGS were of negligible safety significance and that OPG had adequately addressed all findings.

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[149] SOR/2008-273.
[150] CNSC Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*, June 2000.
[151] CNSC Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities*, June 2000.

214. The Commission asked OPG to explain how the additional waste from the requested extended operation was accounted for in its evaluation and whether the additional waste caused any changes to OPG's programs or planning. A representative from OPG reported that its licence renewal application for the PWMF in 2016 had considered the extended operation of the PNGS, and the current licence amendment application did not suggest any changes with nuclear waste management. The OPG representative explained that the quantities of waste, including low-, intermediate- and high-level waste, would continue to be safely managed. In addition, the OPG representative noted OPG's Western Clean Energy Sorting and Recycling Facility, which would minimize low-level waste volumes.[152]

215. Northwatch (CMD 24-H5.45) and C. Drimmie (CMD 24-H5.7) raised concerns regarding the age and capacity of the Pickering IFBs. Northwatch noted that there had been past leaks that resulted in groundwater contamination. The Commission enquired further about this issue. A representative from OPG stated that the IFB liners had been repaired, and that OPG continuously monitors for leaks around the IFBs. The OPG representative added that there had been no recent leaks. With respect to the capacity of the IFBs, a representative from OPG responded that the Pickering B IFB (IFB-B) has enough capacity to store used fuel for the duration of continued operation to the end of 2026.[153]

216. Based on the information on record, as described above, the Commission concludes that OPG has an adequate waste management program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the waste management SCA meet regulatory requirements, including REGDOC-2.11.1 and applicable CSA standards, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026. The Commission is satisfied that OPG has adequate capacity in the IFB-B to store used fuel for the duration of continued operation to the end of 2026.

3.5.12 Security

217. The security SCA covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity. Licence condition 12.1 of PROL-48.01/2028 requires OPG to implement and maintain a security program.

218. Paragraph 12(1)(c) of the GNSCR requires the licensee to take all reasonable precautions to protect the environment and the health and safety of persons, and to maintain the security of nuclear facilities and of nuclear substances. Paragraphs 12(1)(g) and 12(1)(h) require the licensee to implement measures for alerting the

[152] Transcript, June 19, 2024, pages 73-76.
[153] Transcript, June 20, 2024, pages 120-121.

licensee to the illegal use or removal of a nuclear substance, prescribed equipment or prescribed information, or the illegal use of a nuclear facility, and measures for alerting it to acts or attempts of sabotage, anywhere at the site of the licensed activity. Section 12(1)(j) requires the licensee to instruct workers on the physical security program at the site of the licensed activity and on their obligations under that program.

219. The following CNSC REGDOCs include requirements and guidance relevant to the security SCA:

- REGDOC-2.2.4, *Volume III* sets out expectations concerning minimum requirements for Nuclear Security Officer medical, physical, and psychological certificates;
- REGDOC-2.12.1, *High Security Facilities, Volume I: Nuclear Response Force*, Version 2[154] sets out expectations with respect to the minimum requirements for establishing, equipping, training, testing, and deploying an onsite nuclear response force;
- REGDOC-2.12.1, *High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices*[155] provides an approach for meeting the requirements in the *Nuclear Security Regulations*[156] aimed at preventing and detecting unauthorized entry into a protected area or inner area at high-security sites, including the unauthorized entry of weapons or explosive substances; and
- REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*, Version 2.1[157] provides regulatory expectations and guidance for licensees regarding the CNSC's expectations under the GNSCR for security.

CSA N290.7, *Cyber security for nuclear power plants and small reactor facilities*[158] covers the cyber security of new and existing nuclear power plants and small reactor facilities.

220. In section 6.12 of CMD 24-H5.1 and of CMD 24-H5.1A, OPG provided the Commission with information on its security program including the nuclear security program and the cyber security program, along with current improvements and initiatives. OPG reported that its security program underwent a detailed assessment which resulted in programmatic changes in 2023, including procedural revisions to

[154] CNSC Regulatory Document, REGDOC-2.12.1, *High Security Facilities, Volume I: Nuclear Response Force*, Version 2, September 2018. This REGDOC contains prescribed information and is not publicly available.
[155] CNSC Regulatory Document, REGDOC-2.12.1, *High Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices*, April 2018. This REGDOC contains prescribed information and is not publicly available.
[156] SOR/2000-209.
[157] CNSC Regulatory Document, REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material,* Version 2.1, September 2020.
[158] CSA Group Standard, CSA N290.7, *Cyber security for nuclear power plants and small reactor facilities*, 2014 (R2021).

address gaps identified in OPG's security governance, upgrade of its security programs to mitigate security impairments, and development of a security excellence plan focusing on enhancing human performance and improving regulatory compliance. OPG reported that it had executed its 2023 security excellence plan initiatives, and that its 2024 excellence plan was in progress. OPG also noted its plan to implement requirements from CSA N290.7:21 on its cyber security program.

221. In section 4.12 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the security SCA covering the following specific areas:

- Facilities and equipment
- Response arrangements
- Security practices
- Drills and exercises
- Cyber security

222. CNSC staff reported that it made findings of non-compliance in 2021 and 2022 related to failure to meet all applicable regulatory requirements across multiple areas of the security SCA, although there was no immediate nuclear security risk. In May 2023, the CNSC issued an Administrative Monetary Penalty[159] to OPG as a result of a failure to comply with a licence condition in relation to its security program at the Pickering and Darlington Nuclear Generating Stations. CNSC staff submitted OPG had paid the penalty amount and implemented adequate corrective actions. CNSC staff also noted that it increased its regulatory scrutiny and observed notable improvements in OPG's performance in 2023.

223. CNSC staff assessed that OPG's programs within the security SCA would be adequate for continued commercial operation until the end of 2026. CNSC staff did not anticipate any changes under the security SCA other than those already underway to bring OPG back into full compliance with regulatory requirements. CNSC staff noted that it planned to continue with increased regulatory scrutiny of OPG's performance in this SCA.

224. In consideration of OPG's performance related to the security SCA in recent years, the Commission asked if CNSC staff was satisfied with OPG's corrective measures to date, and whether OPG was on track to meet requirements. CNSC staff described its additional compliance verification activities and stated that OPG was on the right track. A representative from OPG provided an update on the progress of OPG's corrective actions and expressed the view that OPG was anticipating that its security SCA-related performance would meet requirements for 2023.[160]

[159] *CNSC Regulatory Action – Ontario Power Generation Inc.*, May 31, 2023.
[160] Transcript, June 20, 2024, pages 149-151.

225. Based on the information on record, as described above, the Commission concludes that OPG has a security program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the security SCA meet regulatory requirements, including the *Nuclear Security Regulations* and applicable REGDOCs, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026. The Commission is satisfied that OPG is on track to completing corrective actions to ensure that its security program is fully compliant with all regulatory requirements. The Commission notes that CNSC staff will continue to provide updates on OPG's performance through its regulatory oversight reports, and the Commission looks forward to updates in this regard.

3.5.13 Safeguards and Non-Proliferation

226. The safeguards and non-proliferation SCA covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT)[161]. Pursuant to the NPT, Canada has entered into a *Comprehensive Safeguards Agreement*[162] and an *Additional Protocol*[163] (safeguards agreements) with the IAEA. The objective of these safeguards agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activity in this country. Licence condition 13.1 of PROL-48.01/2028 requires OPG to implement and maintain a safeguards program.

227. REGDOC-2.13.1, *Safeguards and Nuclear Materials Accountancy*[164] sets out requirements and guidance for safeguards programs for applicants and licensees who possess nuclear material, operate a uranium and/or thorium mine, carry out specified types of nuclear fuel-cycle related research and development work, and/or carry out specified types of nuclear-related manufacturing activities.

228. In section 6.13 of CMD 24-H5.1, OPG provided the Commission with information on its safeguards and non-proliferation program, along with current improvements and initiatives. OPG submitted that its programs and processes related to the safeguards and non-proliferation SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes would be required to these programs and processes to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

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[161] INFCIRC/140.
[162] INFCIRC/164.
[163] INFCIRC/164/Add.1.
[164] CNSC Regulatory Document, REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*, February 2018.

229. In section 4.13 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the safeguards and non-proliferation SCA covering the following specific areas:

- Nuclear material accountancy and control
- Access and assistance to the IAEA
- Operational and design information
- Safeguards equipment, containment and surveillance
- Import and export (requires separate authorization)

230. CNSC staff assessed that OPG's programs within the safeguards and non-proliferation SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff noted that no commitments from the PNGS PSR2-B IIP were related to the safeguards and non-proliferation SCA.

231. Based on the information on record, as described above, the Commission concludes that OPG has an adequate safeguards program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the safeguards and non-proliferation SCA meet regulatory requirements, including REGDOC-2.13.1, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.14 Packaging and Transport

232. The packaging and transport SCA covers the safe packaging and transport of nuclear substances to and from the licensed facility. Licence condition 14.1 of PROL-48.01/2028 requires OPG to implement and maintain a packaging and transport program.

233. The *Packaging and Transport of Nuclear Substances Regulations, 2015*[165] (PTNSR 2015) provides requirements for the packaging and transport of nuclear substances, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages. The *Transportation of Dangerous Goods Regulations*[166] (TDGR) provides requirements for the handling and transport of dangerous goods for all shipments.

234. In section 6.14 of CMD 24-H5.1, OPG provided the Commission with information on its packaging and transport program. OPG submitted that its programs and processes related to the packaging and transport SCA continued to comply with the licensing basis requirements in PROL-48.01/2028. OPG reported that no major changes to these programs and processes would be required to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

[165] SOR/2015-145.
[166] SOR/2001-286.

235. In section 4.14 of CMD 24-H5, CNSC staff submitted its assessment of OPG's performance related to the packaging and transport SCA covering the following specific areas:

- Package design and maintenance
- Packaging and transport
- Registration for use

236. CNSC staff submitted that while shipments of nuclear substances within the nuclear facility, where access to the property is controlled, are exempted from the application of the PTNSR 2015 and the TDGR, OPG had programs in place to ensure compliance with the requirements of both the PTNSR 2015 and the TDGR for all shipments of nuclear substances to and from the PNGS site. CNSC staff assessed that OPG's programs within the packaging and transport SCA met regulatory requirements and would be adequate for continued commercial operation until the end of 2026. CNSC staff noted that no commitments from the PNGS PSR2-B IIP were related to the packaging and transport SCA.

237. Based on the information on record, as described above, the Commission concludes that OPG has an adequate packaging and transport program in place to accommodate the activities that the proposed licence amendment would authorize. The Commission finds that OPG's existing programs and processes related to the packaging and transport SCA meet regulatory requirements, including the PTNSR 2015 and the TDGR, and are adequate to support the continued operation of PNGS Units 5 – 8 to the end of 2026.

3.5.15 Conclusion on OPG's Safety and Control Measures with Respect to the SCAs

238. Based on its analysis of the information provided and discussed above, the Commission is satisfied that OPG is qualified to carry on the licensed activities that the amended licence would authorize. In addition, the Commission finds that OPG has adequate programs and measures in place with respect to the 14 SCAs to ensure that the health and safety of workers, the public and the environment will be protected. The Commission further concludes that OPG has adequate measures in place to provide for the maintenance of national security and to implement international obligations to which Canada has agreed.

239. The Commission notes that all commitments included in the PSR2-B IIP in support of commercial operation of PNGS units 5 – 8 to the end of 2026 are to be completed by OPG by December 31, 2024. The Commission directs CNSC staff to inform it, should OPG fail to meet its commitments. The Commission further notes that OPG is expected to continue to demonstrate its performance and compliance with regulatory requirements at the PNGS on an ongoing basis, until the planned end of commercial operation.

3.6 Indigenous Engagement and Consultation

240. The Commission considered the information provided by CNSC staff, OPG and intervenors regarding Indigenous consultation and engagement activities in respect of this licence amendment application. Indigenous consultation refers to the common law duty to consult with Indigenous Nations and communities flowing from section 35 of the *Constitution Act, 1982*.[167]

241. The common law duty to consult with Indigenous Nations and communities is engaged when the Crown contemplates action that may adversely affect established or potential Aboriginal and/or treaty rights. The CNSC, as an agent of the Crown and as Canada's nuclear regulator, recognizes and understands the importance of building relationships and engaging with Canada's Indigenous Nations and communities. The CNSC ensures that its licensing decisions under the NSCA uphold the honour of the Crown and consider potential impacts to claimed or established Aboriginal and/or treaty rights pursuant to section 35 of the *Constitution Act, 1982*.

242. The duty to consult is engaged wherever the Crown has "knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it"[168]. Licensing decisions of the Commission, where Indigenous interests may be adversely impacted, can engage the duty to consult, and the Commission must be satisfied that it has met the duty prior to making the relevant licensing decision.

243. The *United Nations Declaration on the Rights of Indigenous Peoples Act*[169] (UNDA) came into force in Canada on June 21, 2021. The Government of Canada has clarified that "[t]he Act itself does not immediately change Canada's existing duty to consult Indigenous groups"[170]. Nonetheless, the Commission acknowledges that its commitment to reconciliation, the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP)[171], and section 35, including the Crown's duty to consult and accommodate, have aspects that intersect. The Commission also notes that this is an evolving area of law. As recently articulated in *Thomas and Saik'uz First Nation v. Rio Tinto Alcan Inc.*, while the effect of UNDA on the common law has yet to be determined by the courts, it supports a robust interpretation of Indigenous rights[172].

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[167] Schedule B to the *Canada Act, 1982* (UK), 1982, c 11.
[168] *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73 at para 35.
[169] S.C. 2021, c.14
[170] Department of Justice Canada, *Implementing the United Nations Declaration on the Rights of Indigenous Peoples Act, About the Act*, retrieved from the Department of Justice – Government of Canada's website: https://www.justice.gc.ca/eng/declaration/legislation.html, May 31, 2024.
[171] *United Nations Declaration on the Rights of Indigenous Peoples*, The United Nations Department of Economic and Social Affairs, September 2007.
[172] *Thomas and Saik'uz First Nation v. Rio Tinto Alcan Inc*., 2022 BCSC 15 at para 212.

244. The Commission also considered the *Principles Respecting the Government of Canada's Relationship with Indigenous Peoples*.[173] The Commission recognizes its responsibility to uphold the honour of the Crown during its review of this matter.

245. The duty to consult does not apply to adverse impacts that have occurred in the past or are ongoing; rather it applies to novel adverse impacts[174]. For this application, the Commission finds that an extension of the commercial operation of PNGS units 5 – 8 to the end of 2026 will not create novel adverse impacts to potential or established Indigenous and/or Treaty rights. The Commission comes to this conclusion based on the evidence that there are no proposed changes to the site footprint, PNGS operations, or any other factors that could cause new impacts to the exercise of rights. With respect to the relatively small increase in radioactive waste that this extension will create, the Commission is satisfied that the existing waste management facilities are currently authorized to manage that waste, including the volume.

3.6.1 Indigenous Consultation by CNSC Staff

246. In section 5.1 of CMD 24-H5, CNSC staff provided the Commission with information about its consultation activities with the Indigenous Nations and communities that were identified as having a potential interest in OPG's licence amendment application. CNSC staff identified the following Indigenous Nations and communities who have Indigenous and/or Treaty rights in the area where the PNGS is located:

- Alderville First Nation
- Curve Lake First Nation (CLFN)
- Hiawatha First Nation (HFN)
- Mississaugas of Scugog Island First Nation (MSIFN)
- Chippewas of Beausoleil First Nation
- Chippewas of Georgina Island First Nation
- Chippewas of Rama First Nation

CNSC staff also identified the following Indigenous Nations and communities who have expressed an interest in the PNGS:

- Mohawks of the Bay of Quinte
- Métis Nation of Ontario (MNO) Region 8
- Six Nations of the Grand River
- Mississaugas of the Credit First Nation

[173] Department of Justice Canada, *Principles Respecting the Government of Canada's Relationship with Indigenous Peoples*, 2018.
[174] *Rio Tinto Alcan Inc. v. Carrier Sekani Tribal Council*, 2010 SCC 43, [2010] 2 S.C.R. 650 at para. 48.

247. CNSC staff reported that it sent letters of notification to the identified Indigenous Nations and communities in September 2023 to inform them of OPG's application, opportunities to participate in the hearing process, and the availability of participant funding. CNSC staff noted that it encouraged the identified Indigenous Nations and communities to participate in the regulatory review process and in the public hearing to advise the Commission directly of any concerns they may have. CNSC staff also followed up with each Indigenous Nations and community via email and offered to meet with interested Indigenous Nations and communities to discuss the application.

248. CNSC staff added that it had raised OPG's application in its regular meetings under Terms of Reference agreements with CLFN, HFN, MSIFN, and MNO. CNSC staff reported that, on August 24, 2023, CNSC staff, HFN, and CLFN discussed the licensing process for OPG's application at a monthly joint meeting. CNSC staff noted that it also discussed fish impingement and entrainment limits and OPG's *Fisheries Act* authorization for the PNGS. On September 11, 2023, CNSC staff and MSIFN met and discussed the licensing process at a monthly meeting.

249. CNSC staff expressed its commitment to continuing to engage with CLFN and HFN on their concerns about fish impingement and entrainment at the PNGS, as well as to sharing information and answering questions to address concerns. CNSC staff added that it remains open to meeting with Indigenous Nations and communities to discuss OPG's application, ongoing operations at the PNGS facility, and to encourage and maintain productive and respectful relationships.

250. CNSC staff also provided information about its ongoing engagement and collaboration with identified Indigenous nations and communities, including:

- having Terms of Reference for long-term engagement with several of the identified Indigenous Nations and communities, including with HFN, CLFN, MSIFN, and the MNO
- providing Indigenous Nations and communities with opportunities to participate in the CNSC's IEMP planning and sampling related to PNGS

CNSC staff noted that it would continue to provide opportunities for meaningful long-term engagement over the remaining licence period and through any future licensing activities at the PNGS.

3.6.2 Indigenous Engagement by OPG

251. In section 4.1.4.2 of CMD 24-H5.1, OPG provided information regarding its ongoing engagement with Indigenous Nations and communities with established or asserted rights and/or interests regarding the PNGS. OPG noted that engagement on PNGS

operations is focused on the Williams Treaties First Nations[175] (WTFN) in whose treaty and traditional territory PNGS is located. OPG submitted that it has Framework Agreements and regular meetings with CLFN and MSIFN, and that it was progressing to establish a similar agreement with HFN. OPG added that it had invited Alderville First Nation, Rama First Nation, Beausoleil First Nation and Georgina Island First Nation, and the Mohawks of the Bay of Quinte to engage on areas of interest including environmental monitoring and Pickering operations. OPG also reported providing information to the Mississaugas of the Credit First Nation, the Métis Nation of Ontario Region 8 and Six Nations, who have all expressed interest in PNGS continued operations and licensing activities. OPG added that it engages with identified Indigenous Nations and communities on a regular basis.

252. OPG submitted that it has discussed the following areas of interest with the WTFN, Mohawks of the Bay of Quinte, Six Nations, and Métis Nation of Ontario Region 8:

- waste storage and transportation at PNGS
- thermal plume at PNGS and potential impacts to fish and habitat
- Fisheries and Oceans Canada authorization regarding fish impingement and entrainment
- Pickering End of Commercial Operations timeline
- Pickering Decommissioning timeline
- OPG's Environmental Monitoring Program

In addition to its ongoing engagement activities, OPG reported that it began engagement regarding the current application with CLFN, MSIFN, HFN in 2022. OPG added that it had had telephone calls with the Chiefs of the WTFN and the Saugeen Ojibway Nation.

253. In section 5.1.1 of CMD 24-H5, CNSC staff reported that it reviewed OPG's engagement activities to verify that they met the expectations documented in REGDOC-3.2.2, *Indigenous Engagement*[176], which sets out requirements and guidance for licensees on Indigenous engagement. CNSC staff noted that the licence amendment application did not raise the formal requirements of REGDOC-3.2.2. CNSC staff added that it was satisfied with OPG's efforts in relation to the application.

3.6.3 Submissions by Indigenous Nations and Communities

254. Five Indigenous Nations submitted written or oral interventions on this matter:

- Hiawatha First Nation
- Curve Lake First Nation

[175] The seven Williams Treaties First Nations are: Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation, Mississaugas of Scugog Island First Nation, Chippewas of Beausoleil First Nation, Chippewas of Georgina Island First Nation, and Chippewas of Rama First Nation.
[176] REGDOC-3.2.2, *Indigenous Engagement*, Version 1.2, CNSC, February 2022.

- Mississaugas of Scugog Island First Nation
- Metis Nation of Ontario Region 8
- Saugeen Ojibway Nation

Mississaugas of Scugog Island First Nation

255. Mississaugas of Scugog Island First Nation (CMD 24-H5.49, CMD 24-H5.49A) raised concerns with OPG's application, including on:

- safety
- rights, UNDRIP, and consent
- nuclear waste at the PNGS site
- OPG's environmental risk assessment
- OPG's consultation with MSIFN

In its oral presentation, MSIFN made 8 requests for accommodation.

256. MSIFN expressed the following safety concerns regarding OPG's application:

- Emergency planning – MSIFN is located in the 50 km Ingestion Planning Zone for the distribution of KI, however, there has been a lack of engagement on the KI Working Group and on the PNERP
- Fitness for service – the fitness for service of all spacers in Units 5 – 8 at PNGS has been confirmed up to 264,000 EFPH but not for the proposed new limit of 305,000 EFPH
- Fitness for service – concerns about elevated [Heq] in pressure tubes in extended operation, and that OPG's Periodic Inspection Plan and other OPG mitigation methods will not outweigh the risks of operating pressure tubes beyond their service limits
- Security – requesting that OPG and CNSC comment on Bill C-21's proposed security-related changes to the NSCA to give security personnel the authority to carry out limited peace officer function at nuclear facilities

In light of the above concerns, MSIFN requested that OPG and the CNSC engage in activities that embody a collaborative planning approach with MSIFN and other interested Williams Treaties First Nations concerning all aspects of safety and emergency response planning.

257. With respect to rights, UNDRIP, and consent, the MSIFN submitted its view that "the CNSC must consider UNDRIP and its provision for 'free, prior and informed consent' (FPIC) in interpreting section 35(1) [of the Constitution Act, 1982], especially in light of the recent adoption of the *UNDRIP Act, 2021* (UNDA)". MSIFN noted that the PNGS has been operating since 1971 within its treaty area, without seeking consent for

ongoing operations, creation of new structures on site, or changes to the project and/or its lifecycle. MSIFN urged the Commission to make it mandatory for OPG to secure the consent of MSIFN and other WTFNs before approving any licensing changes associated with the PNGS.

258. MSIFN also noted the Government of Canada's efforts to implement UNDA and the 2023 – 2028 Federal UNDA Action Plan. MSIFN highlighted Action Measure #34, which states that the Canada Energy Regulator (CER) will "work in consultation and cooperation with First Nations, Métis and Inuit communities, governments and organizations to (i) enhance the participation of Indigenous peoples in, and (ii) set the measures that could enable them to exercise federal regulatory authority in respect of, projects and matters that are currently regulated by the Canada Energy Regulator." MSIFN asserted that Action Measure #34 could enable Indigenous governing bodies to exercise regulatory authority under the NSCA and requested that CNSC staff immediately initiate Action Measure #34 specific discussions with MSIFN and other interested Indigenous communities, as well as the Treasury Board of Canada Secretariat.

259. With respect to radioactive waste, MSIFN expressed that the proposed extended operations would result in the generation of additional waste at the PNGS, for which there are only interim solutions. MSIFN noted that it never provided consent for the PNGS, PWMF, or future on-site storage of waste at the Pickering site. MSIFN urged the Commission to consider establishing a provision for First Nation consent, to be enforced by the Commission itself, regarding the management of waste at the PNGS/PWMF sites.

260. With respect to the 2022 ERA for the PNGS, MSIFN noted that it had not been engaged to provide baseline aquatic conditions. MSIFN expressed the view that, in the absence of First Nations contributing to assessments of environmental baseline conditions, there is no way for OPG to conclude that current and historic operations of the PNGS have not created human health or environmental risks from exposure to radiological contaminants, conventional contaminants, and physical stressors present in the environment as a result of over fifty years of site operations. MSIFN recommended that OPG adopt a more collaborative approach that considers First Nation specific risk factors and concerns, including baseline data, and noted that it expects to be consulted during the development of new ERAs for the PNGS.

261. Regarding OPG's consultation efforts, MSIFN expressed that it did not believe that it had been meaningfully consulted about OPG's application, nor about other ongoing and planned activities on the Pickering site. MSIFN noted that there is currently no Pickering specific agreement or relationship in place between MSIFN and OPG, and that a Framework Agreement is a broad relationship agreement, not a project-specific agreement. MSIFN noted that there are several ongoing initiatives at the Pickering site, including the potential refurbishment of Pickering B and proposals for additional structures at the PWMF.

262. MSIFN requested the following accommodations:

1. OPG and the CNSC engage in a collaborative planning approach with MSIFN and other interested WTFNs concerning safety and emergency response planning
2. CNSC, representing the Crown, require OPG to obtain consent from MSIFN and other WTFN for changes to the PNGS and PWMF projects, prior to issuing licence amendments or approvals
3. CNSC staff initiate Action Measure #34 specific discussions with MSIFN and other interested Indigenous communities
4. CNSC require OPG to consult and collaborate with MSIFN on the development of new ERAs for the Pickering NGS
5. CNSC require OPG to provide MSIFN with a regulatory roadmap for the proposed Pickering NGS Refurbishment before any further planning or infrastructure preparation work is initiated by OPG
6. OPG formally commit to supporting MSIFN leadership for a review of International Best Practices for the management and storage of used nuclear fuel at reactor sites
7. OPG provide clarity and a comprehensive consultation and collaborative decision-making plan for nuclear waste generated at its facilities
8. OPG collaboratively work toward the implementation of a Cumulative Effects Assessment that encompasses all facilities within the Treaty Territory, including extensive Indigenous Knowledge study work required for a fulsome Cumulative Effects Assessment

263. The Commission asked for more information concerning the determination that the extended operations of PNGS units 5 – 8 would not cause new adverse impacts to Indigenous communities. CNSC staff responded that its assessment considered that OPG was safely operating within its established licensing basis, and that the continued operation of PNGS units 5 – 8 within regulatory requirements would continue to be protective of the environment. CNSC staff added that, for this licence application, there are no proposed changes to the site footprint, PNGS operations, or any other factors that could cause new impacts to the exercise of rights. CNSC staff acknowledged MSIFN's historical concerns regarding the development of the PNGS site and noted that it was dedicated to continuing to work to address those concerns.[177]

264. The Commission asked for more information on impacts related to the generation and storage of additional radioactive waste. CNSC staff responded that OPG manages the low- and intermediate-level waste from its Pickering and Darlington NGSs at the Western Waste Management Facility, located at the Bruce Nuclear site[178] and the fuel waste from PNGS at the PWMF. CNSC staff noted that the storage and transport of waste at these facilities are currently authorized activities, and that the waste

[177] Transcript, June 19, 2024, pages 70-72

[178] The Bruce Nuclear site is located in the Municipality of Kincardine, Ontario, and on the Traditional and Treaty Territory of the Saugeen Ojibway Nation (SON), and the traditional harvesting territories of the Métis Nation of Ontario (MNO) Region 7 and the Historic Saugeen Métis (HSM) peoples.

management facilities are safely operating within their established licensing bases. CNSC staff added that any proposed changes to those licences, such as a licence renewal or amendment, would trigger engagement and consultation. An OPG representative added that the extended operation of the PNGS was contemplated at the licence renewal for the current licence for the Western Waste Management Facility, and as such, nothing in the current application would modify the licensing basis for that facility. The OPG representative acknowledged that although the continued operation would result in the generation of new waste, there would be no new activities or novel impacts. The OPG representative added that, with minimization practices, the quantity of new waste would be a low amount – a less than one percent increase in overall volume.[179]

265. The Commission asked for more information about OPG's engagement efforts regarding waste. A representative from OPG stated that it engages with the WTFNs and other Indigenous nations and communities through various activities such as staff briefings, information sessions, written communication and/or workshops. The OPG representative noted OPG's Indigenous engagement plan for Pickering to ensure that there is an established forum for dialogue. Noting the WTFNs' interest in waste and decommissioning, the OPG representative stated that OPG was in discussions about developing a waste table forum. CNSC staff added that it has a long-standing ongoing relationship with MSIFN, that they meet regularly, and that they collaboratively develop work plans and agendas for each meeting. CNSC staff added that waste management is often a topic of discussion.[180]

Hiawatha First Nation

266. Hiawatha First Nation (CMD 24-H5.54) provided its views with respect to OPG's application. HFN noted that it appreciates the ongoing efforts of the CNSC and OPG to engage and include its community with respect to activities in its treaty territory. HFN noted that the there is much to do on the path of reconciliation. HFN also noted that it was not consulted on the past decision to carry out nuclear activities in its traditional and treaty territories, and that it has been host to the nuclear industry and the PNGS without its consent.

267. HFN provided comments on OPG's submissions and made recommendations that:

- OPG should enter into negotiations of a project agreement between OPG and HFN (and other Williams Treaties First Nations) addressing meaningful consultation, accommodation and participation in all aspects of the PNGS
- OPG should address how it has met Michi Saagiig standards of protecting health, safety, and security of persons and the environment and national security

[179] Transcript, June 19, 2024, pages 72-76.
[180] Transcript, June 20, 2024, pages 122-126

- OPG should provide appropriate time and resources to allow for First Nation standards to be implemented and to measure compliance through a First Nation lens
- OPG should create timelines, with input from rights holders, that consider and allow for meaningful consultation and engagement with First Nation rights holders
- OPG should create a policy or amend existing policy to allow First Nation rights holders equity and revenue sharing opportunities on existing assets.

268. HFN noted that it was not clear how OPG had reached its conclusions that there were no new adverse impacts on Aboriginal and/or treaty rights. HFN sought explanations of how the conclusion was reached, what adverse impacts to rights have been extended, and what mitigation efforts are being made, and that an understanding of the historical and ongoing impact of the PNGS on Michi Saagiig rights should be demonstrated.

269. HFN also commented that OPG's engagement regarding the proposed application was not meaningful, as there had been a change of plans in its discussions, from the decommissioning of PNGS to life extension. HFN recommended that OPG should co-develop a framework with First Nation rights holders regarding pathways to meaningful engagement and consultation, reconciliation and sustainable development, with appropriate communication protocols and timelines. HFN also noted that there should be project-specific engagement efforts and not just general engagement.

270. With respect to CNSC staff's submission, HFN commented that CNSC staff should consult with First Nations to determine how to change how CNSC staff makes its recommendations to the Commission on the duty to consult. HFN noted that the determination of whether the honour of the Crown and s. 35 Aboriginal/treaty rights have been upheld should be supported by project specific efforts and not general engagement. HFN added that the CNSC should provide opportunities for First Nation input on whether engagement efforts have been satisfactory.

Curve Lake First Nation

271. Curve Lake First Nation (CMD 24-H5.55) acknowledged CNSC staff's ongoing dialogue and work since 2020, and submitted that it is optimistic that its Terms of Reference and Work Plan with the CNSC will result in progress and improvements. CLFN also acknowledged OPG's work since 2020 to build a positive relationship. CLFN noted that timing and capacity are the initial barriers to meaningful consultation and, CNSC and OPG have worked to address these barriers. CLFN also supported the intervention by HFN.

272. With respect to OPG's submission, CLFN recommended that OPG:

- address how s. 25 of the Constitution is being upheld in relation to the application.
- address how the principles of UNDRIP are being implemented in relation to the application.

- address how the 2018 Williams Treaty Settlement is being implemented in relation to the application.
- address how OPG has met Michi Saagiig standards of protecting health, safety, and security of the persons and the environment, and national security
- provide appropriate time and resources to allow for First Nation standards to be implemented and to measure compliance through a First Nation lens
- Investigate and monitor the health of the Michi Saagiig, and the relationship between the land and the people cooperatively with First Nation Rights holders
- create timelines that consider and allow for meaningful consultation and engagement with First Nation Rights holders
- provide rationale for how a project timeline accommodates meaningful consultation and engagement with First Nation Rights holders
- explain how the conclusion has been reached that there are no new adverse impacts on Aboriginal and/or treaty Rights
- explain what adverse impacts to Rights have been extended and what mitigation efforts are being made
- demonstrate understanding of the historical and ongoing impact of the PNGS on Michi Saagiig Rights.
- co-develop a framework with First Nation Rights holders regarding pathways to meaningful engagement and consultation, reconciliation, and sustainable development.
- when assessing whether the honour of the Crown and Aboriginal/treaty Rights have been upheld through the duty to consult and accommodate, the determination should be supported by project specific efforts and not general engagement.

273. With respect to CNSC staff's submission, CLFN recommended that the CNSC:

- continue working on the Terms of Reference and Work Plan to include more substantial and specific discussions on Pickering Nuclear Generating Station.
- include discussions on assessing impacts to Rights and articulating those impacts to Rights in the CMD and in future CMDs linked to future processes.

Metis Nation of Ontario (MNO) Region 8

274. Metis Nation of Ontario (MNO) Region 8 (24-H5.36), in its written submission, provided its perspective and understanding on topics, including:

- fitness for service
- periodic safety review
- radiation protection
- Indigenous consultation and engagement
- emergency preparedness
- environmental protection

275. With respect to engagement, MNO Region 8 noted that there was no specific description of CNSC staff's engagement activities with MNO Region 8. MNO Region 8 recommended that CNSC staff report in a disaggregated way to allow for consideration of adequacy/accuracy. MNO Region 8 likewise commented that OPG should refer to results from ongoing engagement to allow for consideration of accuracy.

276. With respect to the OPG ERA, MNO Region 8 noted that although the CNSC has assessed that members of the public living in the vicinity of Pickering NGS are protected from impacts due to radiological and non-radiological contaminants, this may not address perception-based concerns that MNO Region 8 citizens may have (i.e., mistrust or misinformation). MNO Region 8 noted that it looked forward to further engagement with OPG to increase citizen comfort with nuclear facilities.

277. Further on the topic of OPG's ERA, MNO Region 8 submitted that it would like to continue discussions with OPG related to exposure to carcinogens through fish ingestion, and potentially work with OPG on monitoring catch for hydrazine levels. MNO Region 8 also highlighted that it would like to work with OPG to ensure that justifications of risks to species of importance to MNO Region 8 are correctly applied.

Saugeen Ojibway Nation

278. Saugeen Ojibway Nation (CMD 24-H5.53, CMD 24-H5.53A) in its written submissions, expressed that SON was not consulted with respect to OPG's application, and that SON has not provided consent for waste management in its territory. SON noted that the development of the nuclear industry in SON Territory (Anishinaabekiing) has played a major role in shaping the land and the SON People's place within it, and that without consultation or consent, SON Territory has become host to a number of facilities, including the Bruce Nuclear site and OPG's Western Waste Management Facility. SON added that OPG has been transporting nuclear waste to SON Territory without SON consent for 45 years.

279. SON submitted that the proposed amendment would authorize additional impacts in SON Territory, and that no effort was made to seek SON's free, prior, and informed consent regarding the transportation and storage of the resulting hazardous materials in Anishinaabekiing. SON added that it will not accept the continued importation of radioactive wastes into its Territory from new, expanded, or extended operations without evidence that OPG is prepared to meaningfully address the historical and ongoing impacts from its existing operations.

280. SON expressed that "the SON look to the Commission to ensure Canada's commitments to reconciliation with Indigenous peoples as they relate to the regulation of the nuclear industry are upheld." With respect to UNDRIP, SON submitted that "As an agent of the Crown and a court of record with the power to determine questions of

fact and law, the Commission has the obligations of the State to ensure that no storage or disposal of hazardous materials shall take place in SON Territory without SON's free, prior, and informed consent."[181]

281. In its supplemental submission, SON noted that CNSC staff's CMD did not mention the SON. The SON commented that "only those communities with asserted or recognized rights in the vicinity of the project are recognized as potentially affected" and "that the radioactive waste flowing from these licenced activities is destined invariably for SON Territory is not considered a project impact that triggers consultation with SON."[182] The SON expressed the view that "SON must be noted as an affected Indigenous Nation whenever a licensing process may result in additional radioactive waste being transported to and stored in SON Territory."

282. During the hearing, the Commission sought more information concerning OPG's engagement with SON. An OPG representative stated that, since 2017, OPG has committed to providing annual reports to SON on OPG activities. The OPG representative acknowledged that there are legacy issues related to historical operations, and that OPG was working to have a two-way relationship with SON, with one stream addressing historical concerns and the other focusing on current and future operations. OPG noted that it has had limited progress to date but is using its reconciliation action plan as a guide. CNSC staff stated that it has a long-standing ongoing relationship with SON, with monthly meetings. CNSC staff added that waste management is often a topic of discussion, particularly long-term waste management.[183]

3.6.4 Conclusion on Indigenous Engagement and Consultation

283. The Commission is satisfied with CNSC staff's efforts to consult with Indigenous Nations and communities who have interests in OPG's licence amendment application and on matters relevant to the licence amendment application before the Commission. The Commission finds that it has received sufficient evidence in this regard to render its decision on OPG's application.

284. The Commission finds that the efforts made by CNSC staff to consult with Indigenous Nations and communities are key to the important work of the Commission toward reconciliation and relationship-building with Canada's Indigenous peoples. The Commission expects CNSC staff to continue to build meaningful long-term relationships with Indigenous Nations and communities, as part of the CNSC's reconciliation efforts.

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[181] CMD 24-H5.53, page 7/
[182] CMD 24-H5.53A
[183] Transcript, June 20, 2024, pages 122-126

285. The Commission also recognizes the engagement activities undertaken by OPG. The Commission heard OPG's commitment to undertake further engagement on the next revision to its environmental risk assessment. The Commission encourages and expects OPG to build off of the submissions made by Indigenous Nations and communities in respect of OPG's engagement efforts for this hearing, and particularly the recommendations for further engagement and relationship-building.

286. The Commission recognizes Canada's commitment to UNDRIP and the framework for reconciliation and implementation of UNDRIP set out within UNDA. The Commission has assessed the duty to consult and accommodate in relation to the licence amendment within the context of and with acknowledgement of UNDA.

287. The Commission is satisfied that the proposed licence amendment is not likely to have potential new impacts on Indigenous and/or treaty rights. Based on the information presented on the record for this hearing, the Commission finds that the proposed extended operations of PNGS Units 5 – 8 represents a continuation of an already licensed activity, with no proposed changes to operations. The Commission is satisfied that the measures that are currently in place to manage potential risks to persons or the environment are adequate, and that no changes to current measures, and no additional measures, programs or procedures are needed. The Commission notes that OPG continues to actively monitor and assess its operations to confirm that there are no unforeseen effects on the environment.

288. With respect to concerns raised regarding waste management, the Commission is satisfied that the generation of additional waste from the continued operation PNGS units 5 – 8 would not result in novel impacts. The Commission is satisfied that OPG's waste management facilities are currently authorized to manage the additional waste. With respect to the waste that will be transported to and stored at the Western Waste Management Facility (WWMF) at the Bruce Power site, the Commission is satisfied that the transfer and management of the waste will not create any novel adverse impacts.

289. The Commission acknowledges the comments made by SON about having not been directly engaged on this application and appreciates SON's submissions on this matter. While the transportation and waste management facilities are not being considered by the Commission in this proceeding, the Commission notes CNSC staff's long-standing, ongoing relationship with SON and reinforces the efforts in discussing long-term waste management.

290. With respect to the 8 requests for accommodation from the MSIFN, the Commission notes the following:

- Request 1 concerning safety and emergency planning: the Commission encourages OPG and CNSC staff to engage in a collaborative planning approach with MSIFN and other interested WTFNs concerning safety and emergency response planning, including on issues involving the Potassium Iodide (KI) Pill Working Group.

- Request 2 regarding Free Prior and Informed Consent: The Commission notes that the objective of free, prior and informed consent involves parties working together in good faith to strive to achieve consensus regarding decisions that may impact the rights and interests of Indigenous Nations. The Commission does not see consent as a requirement in respect of this licence amendment but looks forward to the efforts of both OPG and CNSC staff to continue to work together in good faith with the MSIFN.
- Request 3, about the implementation the UNDA Action Plan Measure 34: The Commission considers this request to be beyond the scope of the current application.
- Request 4 regarding development of ERAs: The Commission acknowledges OPG's commitment to collaborate in the development of the next ERA and in environmental monitoring and expects OPG to continue these efforts.
- Requests 5 to 8: The Commission encourages OPG to collaborate with MSIFN on the Nation's priorities regarding the Pickering facilities, and in particular on OPG's planned operations on the Pickering site.

291. The Commission also acknowledges the requests by MSIFN for more information regarding both Bill C-21, *An Act to amend certain Acts and to make certain consequential amendments (firearms)* and the fitness for service of the pressure tubes for up to 305,000 EFPH for unit 6 and directs CNSC staff to engage with MSIFN to provide sufficient information to on these issues. The Commission looks forward to being updated by CNSC staff and OPG with respect to the above activities.

292. The Commission encourages both CNSC staff and OPG to continue engagement activities relating to the PNGS with Curve Lake First Nation and Hiawatha First Nation based on the submissions made by the Nations in this hearing. For example, both Nations indicated a desire to co-develop with OPG a framework agreement on pathways to meaningful engagement and consultation. As well, Curve Lake First Nation indicated a desire to have a Terms of Reference and Work Plan to engage in more specific discussion on PNGS with CNSC staff.

293. The Commission notes MNO Region 8's observation that there was no description of CNSC staff's engagement activities with their Nation specifically and looks forward to receiving more granular information on this relationship in the future. The Commission encourages both OPG and CNSC staff to work collaboratively with the MNO Region 8 on emergency preparedness and ERAs relating to the PNGS.

3.7 Other Matters of Regulatory Importance

3.7.1 Public Engagement

294. A public information and disclosure program (PIDP) is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities. Licence condition G.6 of PROL-48.01/2028 requires OPG to implement and maintain a public

information and disclosure program. REGDOC-3.2.1, *Public Information and Disclosure*[184] sets out requirements for public information programs, disclosure protocols, and related documentation as they relate to licensed activities.

295. In section 4.1.4 of CMD 24-H5.1, OPG submitted that it has a public information program to ensure that persons with a potential interest in PNGS operations and performance are provided with relevant information and can share their views and perspectives. OPG noted that it uses a variety of communication methods to distribute information and solicit feedback. OPG added that it has publicly available quarterly reports on station operations and environmental performance.

296. In section 5.3 of CMD 24-H5, CNSC staff confirmed that OPG's PIDP complies with REGDOC-3.2.1. CNSC staff noted that, since changes to the activities at the PNGS site are not expected, OPG's current PIDP remains adequate for the proposed extended operation of the PNGS. CNSC staff noted that it encourages OPG to revise its PIDP annually to ensure that information is relevant, timely, and accurately communicates the activities of most interest to the public.

297. Based on the information on record, as described above, the Commission concludes that OPG has adequate measures in place to communicate to the public information about the health, safety and security of persons and the environment, including information relevant to the continued operations of PNGS units 5 – 8 to December 31, 2026.

3.7.2 Decommissioning Plans and Financial Guarantee

298. The NSCA and its regulations require licensees to make adequate provision for the safe decommissioning of their facilities and for the long-term management of waste produced during the life of a facility. In order to ensure that adequate resources are available for the safe and secure future decommissioning of the PNGS, the Commission requires that an adequate financial guarantee for the realization of planned activities be put in place and maintained in a form acceptable to the Commission throughout the licence period. Licence condition 11.2 requires OPG to implement and maintain a decommissioning strategy. Licence condition G.5 requires OPG to maintain a financial guarantee for decommissioning that is acceptable to the Commission.

299. In section 6.2 of CMD 24-H5, CNSC staff confirmed that OPG maintains a financial guarantee for PNGS in accordance with regulatory requirements. CNSC staff explained that OPG maintains a consolidated financial guarantee for decommissioning its Ontario assets, including the PNGS, which the Commission accepted in 2022.[185] CNSC staff noted that OPG's consolidated financial guarantee covers the 2023-2027 period, and that OPG is required to revise decommissioning plans, including the associated cost

[184] REGDOC-3.2.1, *Public Information and Disclosure*, CNSC, May 2018.
[185] Record of Decision DEC 22-H104, *Application for Acceptance of Ontario Power Generation's Revised Consolidated Financial Guarantee*, December 6, 2022.

estimates and financial guarantee, on a five-year cycle; OPG's next financial guarantee submission is due in 2027. CNSC staff submitted that OPG's current financial guarantee is adequate for the continued operation of PNGS units 5 – 8 to December 31, 2026.

300. The Commission is satisfied that OPG's PDP and financial guarantee for the PNGS are adequate to account for the continued operation of PNGS units 5 – 8 to December 31, 2026, and that OPG continues to maintain a financial guarantee acceptable to the Commission.

3.7.3 Nuclear Liability Insurance

301. The *Nuclear Liability and Compensation Act*[186] (NLCA) and the regulations made under it establish a compensation and liability regime for Canada in the unlikely event of a nuclear accident resulting in civil injury and damages. The NLCA is administered by Natural Resources Canada (NRCan). The PNGS site is currently designated, pursuant to section 7 of the NLCA, as a nuclear installation in Item 4, Column 1 of the Schedule of the *Nuclear Liability and Compensation Regulations*[187] (NLCR). The PNGS falls under the "Power Reactor Class" pursuant to paragraph 4(2)(a) of the NLCR, and OPG's liability amount is prescribed at $1 billion pursuant to paragraph 24(1)(d) of the NLCA.

302. In section 6.5 of CMD 24-H5, CNSC staff reported that OPG is meeting its obligation for nuclear liability coverage under the NLCA. Based on the information provided on the record for this hearing, the Commission is satisfied that OPG is compliant with the NLCA financial security obligations.

3.8 Licence Amendment

303. The Commission considered OPG's application for an amendment to its current power reactor operating licence for the PNGS, PROL-48.01/2028, to extend the commercial operation of PNGS Units 5 – 8 until December 31, 2026, and increase the operating limit for PNGS Units 5 – 8 to up to a maximum of 305,000 EFPH. OPG's current licence expires on August 31, 2028.

3.8.1 Proposed Licence Amendment

304. In Part 2 of CMD 24-H5, CNSC staff proposed 2 changes to OPG's licence for the PNGS. Considering recent Commission decisions and advancements in understanding of pressure tube behaviour, CNSC staff recommended that the Commission remove licence condition 15.3 and add a new licence condition 6.2. CNSC staff noted that these

[186] S.C. 2015, c. 4, s. 120.
[187] SOR/2016-88.

proposed changes reflect recent Commission decisions[188, 189, 190] regarding the discovery of elevated [Heq] in pressure tubes in extended operation. CMD 24-H5 included a proposed amended licence for the Commission's consideration.

305. In proposing the removal of licence condition 15.3 ("Before Hydrogen equivalent concentration exceeds 120 ppm, the licensee shall demonstrate that pressure tube fracture toughness will be sufficient for safe operation beyond 120 ppm"), CNSC staff submitted that licence condition 15.3 was no longer applicable. CNSC staff explained that licence condition 15.3 had been included in OPG's PROL for transparency, and to provide OPG with clear compliance verification criteria for maintaining pressure tube fracture toughness sufficient for safe operation prior to operation with [Heq] beyond 120 ppm. CNSC staff noted that, based on results of CNSC staff assessments of findings of elevated Heq in some pressure tubes in extended operation, the compliance verification criteria for pressure tubes in extended operation had evolved and licence condition 15.3 no longer served its intended purpose.

306. CNSC staff submitted that the proposed licence condition 6.2 would require OPG to implement and maintain an enhanced fitness for service program for fuel channels during extended operation. CNSC staff explained that, since the fitness for service criteria established under licence condition 6.1 of the current licence ("The licensee shall implement and maintain a fitness for service program") cannot be confirmed in the regions of interest of pressure tubes, the proposed licence condition 6.2 would establish the requirements for reporting the status of OPG's R&D activities, as well as the interim approaches to assessing the safe operability of pressure tubes when the validity of the fitness for service criteria established in licence condition 6.1 cannot be confirmed. CNSC staff noted that the proposed amendment would capture all fitness for service requirements under the same section of the PROL. CNSC staff further noted that OPG had already implemented an enhanced fitness-for-service program for fuel channels in extended operation.[191]

307. In Part 2 of CMD 24-H5, CNSC staff also informed the Commission of its planned changes to the Licence Conditions Handbook (LCH), relevant to the proposed new licence condition 6.2. The proposed changes include Heq limits, definitions of the regions of interest, the R&D program, and interim approaches to assess the safe operability of pressure tubes. CNSC staff submitted that it would continue to monitor OPG's performance with respect to pressure tube fitness for service, through the compliance verification activities in relation to licence conditions 6.1 and 6.2. CNSC staff recommended that the proposed licence condition 6.2 remain in place until the

[188] Record of Decision DEC 2021-H111, *Request for Authorization to Restart Pickering Nuclear Generating Station B Unit 5 following a forced outage*, December 6, 2021.
[189] Record of Decision DEC 2021-H112, *Request for Authorization to Restart Pickering Nuclear Generating Station B Units 6-8 following future outages*, December 22, 2021.
[190] Record of Decision DEC 23-H103, *Application to Amend the Power Reactor Operating Licence for the Bruce Nuclear Generating Stations A and B with Respect to Fitness for Service Requirements*, October 13, 2023.
[191] CMD 24-H5, page 14.

R&D work committed to by OPG is complete and until OPG can demonstrate, to the Commission's satisfaction, that the fitness for service criteria under licence condition 6.1 applicable to the ROIs of pressure tubes can be met.

308. The Commission enquired about the high-level components of the enhanced fitness for service program for fuel channels, required by the proposed new licence condition 6.2, as well as how this program would evolve along with further R&D around the degradation of pressure tubes. CNSC staff explained that aspects of the proposed new licence condition 6.2 were related to the discovery of elevated [Heq] including monitoring and inspection of fuel channels as well as R&D around modeling to higher [Heq] levels. A representative from OPG added that the enhanced fitness for service program would be consistent with the Commission's decisions regarding high [Heq] and that OPG had started the R&D activities with peer utilities.[192]

309. The Commission is satisfied that licence condition 15.3 is no longer applicable, given the findings of elevated Heq in some pressure tubes in extended operation and that the compliance verification criteria for pressure tubes in extended operation have evolved.

310. The Commission finds that proposed licence condition 6.2 recommended by CNSC staff, to require that OPG implement and maintain an enhanced fitness for service program for fuel channels in extended operation, will provide for adequate regulatory oversight. The Commission notes that OPG is required to demonstrate, to CNSC staff's satisfaction, the ongoing fitness for service of PNGS units 5 – 8 up until the planned end of commercial operations.

311. Therefore, the Commission accepts the proposed licence amendments as submitted by CNSC staff in section 3.2.2 of CMD 24-H5. The Commission is satisfied that:

- licence condition 15.3 is no longer applicable and can thus be removed from the licence
- the proposed licence condition 6.2 will provide for adequate regulatory oversight of fuel channels in extended operation.

312. Regarding CNSC staff's recommendation that licence condition 6.2 remain in place until the R&D work committed to by OPG is complete and until OPG can demonstrate, to the Commission's satisfaction, that the fitness for service criteria under licence condition 6.1 applicable to the ROIs of pressure tubes can be met, the Commission notes that it will consider any future licence amendment application that may be made in a separate public proceeding of the Commission. The Commission further notes that CNSC staff can bring any matter to the Commission as required.

[192] Transcript, June 19, 2024, pages 152-153.

3.8.2 Operating limit for PNGS Units 5 – 8 up to a maximum of 305,000 EFPH

313. The current operating limit for PNGS units 5 – 8 pressure tubes is 295,000 EFPH. OPG has requested an increase to the current pressure tube operating limit up to a maximum of 305,000 EFPH. As provided in section 4.1.3.2 of CMD 24-H5.1, OPG projected a new end of life for operation of the units 5 – 8 major components, including pressure tubes, of up to 305,000 EFPH for the lead unit (Unit 6). OPG's projected EFPH of each unit for operation to the end of 2026 is provided in the following table:

Unit	Projected EFPH
5	297,500
6	305,000
7	298,000
8	283,000

OPG submitted that, based on the established programmatic controls for managing fuel channel aging, which include an extensive reactor inspection program, sound technical assessments, and the implementation of mitigating measures where required, it was confident that PNGS fuel channels will remain fit for service up to 305,000 EFPH.

314. In section 4.6 of CMD 24-H5, CNSC staff reported that it agreed with OPG's proposed approach to demonstrate the continued fitness for service of major components for operation to the end of 2026 and up to 305,000 EFPH. CNSC staff noted that OPG would have to:

- complete the IIP actions related to the demonstration of fitness for service of major components
- complete the open CNSC action items and OPG commitments related to fitness for service of fuel channels
- continue to demonstrate fitness for service of major components on an ongoing basis following established processes and through regular inspections, consistent with the component specific life cycle management plan (LCMP) and regulatory requirements.

On that basis, CNSC staff assessed that OPG has adequately demonstrated, in accordance with regulatory requirements, that the fuel channels for PNGS units 5 – 8 are fit for service up to 305,000 EFPH. CNSC staff recommended that the Commission authorize the pressure tube operating limit to up to 305,000 EFPH.

315. The Commission concludes that OPG has adequately demonstrated, in accordance with regulatory requirements, that the fuel channels for PNGS units 5 – 8 are fit for service up to 305,000 EFPH. As described in sections 3.4 and 3.5 of this *Record of Decision*,

the Commission is satisfied with the measures that OPG has in place for pressure tubes in extended operation, including fitness for service assessments and an aging management program. As previously stated, OPG is required to demonstrate, to CNSC staff's satisfaction, the ongoing fitness for service of PNGS units 5 – 8 up until the planned end of commercial operations

4.0 CONCLUSION

316. The Commission has considered OPG's licence amendment application, the information and submissions of OPG, and CNSC staff, as well as the interventions submitted for the hearing. Based on its consideration of the evidence on the record, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, amends PROL-48.01/2028, issued to OPG for the PNGS located in the Municipality of Durham, Ontario, as follows:

- amends PROL-48.01/2028 to remove licence condition 15.3, Pressure Tube Assessment for Safe Operation:

  "*Before Hydrogen equivalent concentration exceeds 120 ppm, the licensee shall demonstrate that pressure tube fracture toughness will be sufficient for safe operation beyond 120 ppm.*"; and

- amends PROL-48.01/2028 to add new licence condition 6.2, Fitness for Service Program for Fuel Channels in Extended Operation:

  "*The licensee shall implement and maintain an enhanced fitness for service program for fuel channels in extended operation.*"

The amended licence, PROL-48.02/2028, remains valid until August 31, 2028.

With respect to procedural matters for this hearing,

Timothy Berube Digitally signed by Timothy Berube
Date: 2024.12.17 13:53:45 -05'00'

Dr. Timothy Berube
Acting President of the Commission, as a Panel of the Commission

With respect to the Commission's decision,

Timothy Berube Digitally signed by Timothy Berube
Date: 2024.12.17 13:54:13 -05'00'

Dr. Timothy Berube
Presiding Member

Appendix A – List of Intervenors

Intervenors – Oral Presentations	**Document Number**
CANDU Owners Group, represented by R. Clavero	CMD 24-H5.10
North American Young Generation in Nuclear, represented by M. Maringer	CMD 24-H5.15
Pickering Nuclear Community Advisory Council, represented by D. Hardy and N. Fontana	CMD 24-H5.23
Durham Nuclear Awareness, Slovenian Home Association, and the Canadian Environmental Law Association, represented by S. Libman and M.V. Ramana	CMD 24-H5.29 CMD 24-H5.29A
Ajax-Pickering Board of Trade, represented by A. Leetham and D. Terry	CMD 24-H5.30
Pickering Harbour Company Limited, Frenchman's Bay Harbour & Marine Service Company Limited, represented by D. Spencer	CMD 24-H5.33 CMD 24-H5.33A CMD 24-H5.33B
Canadian Nuclear Society, represented by N. Alexander	CMD 24-H5.34 CMD 24-H5.34A
Paul Sedran, RESD Incorporated	CMD 24-H5.35 CMD 24H5.35A
North American Young Generation in Nuclear – Durham Chapter, represented by V. Sunassy and P. Sambavalingam	CMD 24-H5.38
Nordion (Canada) Inc., represented by R. Wassenaar	CMD 24-H5.39
Kinectrics, represented by S. Donnelly	CMD 24-H5.40 CMD 24-H5.40A
Canadian Nuclear Association, represented by J. Baker	CMD 24-H5.43
Canadian Coalition for Nuclear Responsibility, represented by G. Edwards	CMD 24-H5.44
Sunil Nijhawan	CMD 24-H5.46
Canadians for Nuclear Energy, represented by C. Adlam and J. Besseling	CMD 24-H5.48
Mississaugas of Scugog Island First Nation, represented by Chief K. LaRocca	CMD 24-H5.49 CMD 24-H5.49A
Society of United Professionals, represented by J. Fierro, R. Chatoor and R. Manley	CMD 24-H5.52

Intervenors – Written submissions	**Document Number**
Greater Oshawa Chamber of Commerce	CMD 24-H5.2
Rotary Clubs of Ajax and Pickering	CMD 24-H5.3
Station Gallery	CMD 24-H5.4
369 Global	CMD 24-H5.5
Town of Ajax	CMD 24-H5.6
Lakeridge Health and the Ajax Pickering Hospital Foundation	CMD 24-H5.7

PineRidge Arts Council	CMD 24-H5.8
Abilities Centre	CMD 24-H5.9
Women in Nuclear Canada	CMD 24-H5.11
Durham College	CMD 24-H5.12
Organization of Canadian Nuclear Industries	CMD 24-H5.13
Earth Rangers	CMD 24-H5.14
Elexicon Energy Inc.	CMD 24-H5.16
Matheis Financial Group	CMD 24-H5.17
Canadian Association of Nuclear Host Communities	CMD 24-H5.18
Durham Region Steps for Life Committee	CMD 24-H5.19
BWXT Canada Ltd.	CMD 24-H5.20
Regional Municipality of Durham	CMD 24-H5.21
Durham Community Foundation	CMD 24-H5.22
Pickering Naturalists	CMD 24-H5.24
Gurley Leadership Solutions	CMD 24-H5.25
City of Pickering	CMD 24-H5.26
Scientists in School	CMD 24-H5.27
Clarity Chiropractic	CMD 24-H5.28
Paul Filteau	CMD 24-H5.31
Janet Graham	CMD 24-H5.32
Métis Nation of Ontario	CMD 24-H5.36
Girls Incorporated of Durham	CMD 24-H5.37
Ontario Tech University	CMD 24-H5.41
Ontario Federation of Anglers and Hunters	CMD 24-H5.42
Northwatch	CMD 24-H5.45
Christine Drimmie	CMD 24-H5.47
Graymatter Marketing and Media Solutions Inc.	CMD 24-H5.50
Whitby Chamber of Commerce	CMD 24-H5.51
Saugeen Ojibway Nation	CMD 24-H5.53 CMD 24-H5.53A
Hiawatha First Nation	CMD 24-H5.54
Curve Lake First Nation	CMD 24-H5.55