Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 26-H103.8

Date: 2026-08-05

Written Submission from the Canadian Environmental Law Association

Mémoire de l'Association canadienne du droit de l'environnement

In the matter of

À l'égard du

Bruce Power

Bruce Power

Application to amend the licensing basis for Bruce A and B nuclear generating stations to operate Units 7 and 8 pressure tubes beyond 300,000 effective full power hours

Demande visant à modifier le fondement d'autorisation des centrales nucléaires de Bruce-A et B afin d'exploiter les tubes de force des tranches 7 et 8 au-delà des 300 000 heures équivalentes pleine puissance

Hearing in Writing

Audience par écrit

August 2026

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Canada

Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.

SUBMISSION BY THE CANADIAN ENVIRONMENTAL LAW ASSOCIATION TO THE CANADIAN NUCLEAR SAFETY COMMISSION

Comments on Bruce Power's application to amend the licensing basis for Bruce A and B nuclear generating stations to operate Units 7 and 8 pressure tubes beyond 300,000 effective full power hours

(Ref. 2026-H-103)

August 5, 2026

Prepared by:
Sara Libman, Legal Counsel to CELA

August 5, 2026

Sent by email interventions@cnsc-ccsn.gc.ca

Senior Tribunal Officer, Secretariat
Canadian Nuclear Safety Commission
280 Slater Street,
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Dear Sir or Madam:

Re: Submission of Canadian Environmental Law Association reviewing Bruce Power's application to amend the licensing basis for Bruce A and B nuclear generating stations to operate Units 7 and 8 pressure tubes beyond 300,000 effective full power hours (EFPH) (Ref. 2026-H-103)

The Canadian Environmental Law Association ("CELA") has enclosed its written intervention providing comments on Bruce Power's application for a licensing basis amendment to operate pressure tubes in Units 7 and 8 beyond the current limit of 300,000 EFPH, up to a maximum of 310,000 EFPH.

Please find below our submission for your review.

By this letter, and pursuant to the CNSC's *Rules of Procedure*, CELA requests status to participate as an intervenor in the public hearing based in writing through the provision of this written intervention.

Sincerely,

CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Sara Libman
Legal Counsel to CELA
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I. INTRODUCTION

This submission is filed in response to the Canadian Nuclear Safety Commission's ("CNSC") Revised Notice of Hearing in Writing and Participant Funding dated February 20, 2026 in respect of the CNSC conducting a hearing in writing on Bruce Power's application to amend the licensing basis for Bruce A and B nuclear generating stations to operate pressure tubes in Units 7 and 8 beyond the current limit of 300,000 Equivalent Full Power Hours (EFPH), up to a maximum of 310,000 EFPH. Bruce Power is seeking this authorization to provide flexibility in scheduling the Major Component Replacement outages for Units 7 and 8. A decision from the Commission is anticipated in October 2026.[1]

II. INTEREST AND EXPERTISE

The Canadian Environmental Law Association ("CELA") is a non-profit, public interest law organization. For over 50 years, CELA has used legal tools to advance the public interest, through advocacy and law reform, in order to increase environmental protection and safeguard communities across Canada. CELA is funded by Legal Aid Ontario as a specialty legal clinic, to provide equitable access to justice to those otherwise unable to afford representation.

CELA has engaged in detailed research and advocacy related to public safety and environmental protection by seeking improvements to nuclear emergency preparedness. We have also appeared before the CNSC on a number of licensing matters, as well as the federal environmental assessment proceedings for multiple Nuclear Power Generating Sites ("NPGS") and proposed projects, including projects proposed by Bruce Power. CELA also has an extensive library of materials related to Canada's nuclear sector which is publicly available on our website.[2]

III. BACKGROUND

On September 26, 2025, Bruce Power submitted a request to the CNSC seeking approval to operate Bruce B Units 7 and 8 (the "Request") up to 310,000 EFPH. The Bruce B nuclear generating station is located in the Municipality of Kincardine, on the eastern shore of Lake Huron, on the traditional and treaty territory of the Saugeen Ojibway Nation, and the traditional harvesting territories of the Métis Nation of Ontario Region 7 and the Historic Saugeen Métis peoples.[3]

In addition to this application, Bruce Power is currently waiting for a separate hearing in writing decision from the Commission regarding its application to amend its licensing basis of the power reactor operating licence be amended to allow Bruce A to operate at 95.5% FP and for Bruce B to

[1] CNSC, "Revised Notice of Hearing in Writing and Participant Funding" (Ref. 2026-H-103), February 20, 2026, online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD2026-H-103-CR-NTC-PFP-REV1-ENG.pdf/object

[2] Canadian Environmental Law Association, online: www.cela.ca

[3] Revised Notice of Hearing in Writing and Participant Funding

operate at 96.0% FP (Hearing Ref. 26-H104). Originally, both of these hearings in writing were anticipated to have decisions from the Commission in July 2026, with interventions due in May 2026.[4] However the timeline for this matter (Hearing Ref. 2026-H103) was rescheduled, with interventions due in August 2026, and a decision from the Commission now anticipated in October 2026. In addition to providing comments on this matter, the intervenor was also awarded participant funding to provide comments on Bruce Power's request to increase the power limits for Bruce A and B.[5]

Currently, Bruce Power is authorized to operate each reactor to a limit of 300,000 EFPH, in accordance with the Commission's decision for Bruce Power's licence renewal hearing in 2018.[6]

According to Bruce Power's application to the CNSC, the reasoning behind this request is "to provide the operational flexibility to optimize the overall Major Component Replacement (MCR) schedule. Although neither unit is expected to operate to the full 310,000 EFPH, this extension of the licence limit will provide the regulatory certainty and operational margin needed to ensure safe execution of these large refurbishment projects."[7]

Bruce Power's request arises following a troubling finding in 2021 regarding elevated Hydrogen Equivalent Concentration (Heq) in pressure tubes of Units 3 and 6 exceeding the 120 ppm Heq concentration limit established by the Commission.[8]

As a result of this exceedance that could impact reactors with pressure tubes operating beyond 210,000 EFPH, the Commission issued orders to Bruce Power and OPG to ensure that any reactor in extended operation that had been shut down was not restarted until authorized by the Commission.[9] This event resulted in an investigation into the elevated Heq concentrations in pressure tubes, and ultimately resulted in the establishment of Licence Condition 6.2 of PROL 18.04/2028: "*The licensee shall implement and maintain an enhanced fitness for service program for fuel channels in extended operation*."[10]

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[4] CNSC, "Notice of Hearing in Writing and Participant Funding" (Ref. 2026-H-103), November 10, 2025, online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD2026-H-103-NTC-ENG.pdf/object

[5] CELA, "Comments on Bruce Power's application to amend the licensing basis for Bruce A and B nuclear generating stations to increase reactor power limits" (CMD 26-H104.13) May 12, 2026, online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD26-H104-13-CELA-SUB.pdf/object

[6] CNSC Staff, "Bruce B Units 7 and 8: Request to Extend Operation up to 310,000 Equivalent Full Power Hours" CMD 26-103 (June 25, 2026), at page 1 **[CNSC Staff, CMD 26-H103]**

[7] Bruce Power, "Bruce B Units 7 and 8: Review of Fuel Channel Fitness for Service Program to Extend Operation up to 310,000 Effective Full Power Hours" (September 26, 2025) at page 1 **[Bruce Power Application]**

[8] CNSC, "Order by a Designated Officer under Paragraph 37(2)(f) and Subsection 35(1) of the *Nuclear Safety and Control Act*" July 26, 2021, online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/20210726-designated-officer-order-to-Bruce-Power.pdf/object

[9] CNSC, "Pressure Tubes: The Heart of the Reactor" (website), online: https://www.cnsc-ccsn.gc.ca/eng/resources/fact-sheets/pressure-tubes/#sec-7

[10] CNSC Staff, CMD 26-H103, at page 7

IV. SCOPE OF REVIEW

CELA received participant funding to review the Bruce Power's licence amendment application, including CNSC and Bruce Power Commission Member Documents, and conduct legal/technical analysis focusing on areas of interest within the scope of Bruce Power's application.

This intervention is directly relevant to the Commission's duty under section 24(4) of the *Nuclear Safety and Control Act* (NSCA) to ensure the adequate protection of the environmental and human health.[11] CELA's findings and recommendations, below, aim to advance the objectives of the Commission and are directly relevant to this licensing basis amendment. CELA's review also recommends how the CNSC, enabled by section 24(4) of the *NSCA,* can incorporate principles of international environmental law, such as the precautionary principle, in its review of Bruce Power's application to operate Units 7 and 8 beyond 300,000 EFPH.

For this written submission, CELA has reviewed CNSC regulatory oversight reports, relevant international reports and standards associated with radioactive materials and nuclear safety, academic reports and studies concerning human health and environmental effects, and other CNSC policies and regulatory provisions.

V. FINDINGS

Following its review of Bruce Power's application, CNSC Staff make the following recommendation to the Commission:

> […] Bruce Power's **fuel channel fitness for service program is sufficient to support the request** to extend the maximum allowable operating time of pressure tubes in Bruce NGS B Units 7 and 8 from 300,000 EFPH to 310,000 EFPH. CNSC Staff **recommend that the Commission authorize Bruce Power to operate Bruce NGS B Units 7 and 8 to an EFPH limit of 310,000 Equivalent Full Power Hours**.[12]

After reviewing the publicly available submissions by CNSC staff and Bruce Power, the intervenor submits there is too much uncertainty pressure tube integrity in aging Units 7 and 8. For the reasons below, the intervenor submits the Commission should **not** approve Bruce Power's request to operate Bruce NGS B Units 7 and 8 to an EFPH limit of 310,000 Equivalent Full Power Hours.

The intervenor submits there are health and safety concerns, as well as environmental impact concerns, that arise from operating Unit 7 and 8 pressure tubes beyond 300,000 EFPH, and in the

[11] *Nuclear Safety and Control Act*, SC 1997, c 9 **[NSCA]**
[12] CNSC Staff, CMD 26-H103 at page 21, *emphasis added*

interest of complying with section 24(4) of the *NSCA*, the Commission must carefully scrutinize the risks associated with this application.

(a) Precautionary Principle

The precautionary principle requires a cautionary approach in which a decision-maker presented with evidence that an activity is likely to cause irreversible harm to the environment is obligated to prevent or terminate the activity.[13] This principle of international environmental law has also been adopted into Canada's application of environmental law, as held by the Supreme Court of Canada in its seminal 2001 decision in *SprayTech*:

> The interpretation of By-law 270 contained in these reasons respects international law's "precautionary principle", which is defined as follows at para. 7 of the Bergen Ministerial Declaration on Sustainable Development (1990):
>
> > In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.[14]

As such, there is a positive duty on the CNSC to ensure the activities it licences do not cause unacceptable or irreversible harm to the environment.[15] For the 2015 public hearing to renew the reactor operating licence for the Bruce NPGS A and B, we had submitted:

> Operating reactors beyond their original anticipated design lives violates the precautionary principle, basic principles of the rule of law, and the implicit agreement the public entered into with NPPs when these facilities were originally built. Public protective laws should not be bent for present expediency in any event, but especially not in an instance when doing so would expose the public to an enhanced risk in an already high-risk industry that the public did not contemplate when it first approved of the Bruce plant and other nuclear facilities.[16]

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[13] Cameron J and Abouchar J, "The precautionary principle: a fundamental principle of law and policy for the protection of the global environment" (1990) 14:1 Boston College International and Comparative Law Review at page 3, online: https://lira.bc.edu/works/publication-article/xs5ge-tq903 **[Cameron & Abouchar].**

[14] *114957 Canada Ltee (Spray-Tech) v Hudson (Ville)*, 2001 SCC 40 (CanLII) at para. 31.

[15] Cameron & Abouchar at page 22

[16] CELA, "Canadian Environmental Law Association: Review and Submissions on Bruce A and B Reactor Relicensing and the Emergency Management Regulatory System" April 7, 2015, online: https://cela.ca/wp-content/uploads/2019/07/Hearing_2015-H-02-CELA_Submissions_to_CNSC_re_Bruce_Power_Relicensing.pdf at page 72

The intervenor maintains this position, and notes that the precautionary principle must be applied to Bruce Power's request. The intervenor notes that this is not the first time Bruce Power has obtained authorization to increase the Equivalent Full Power Hour operations of its units:

- Original target: **210,000 EFPH**;
- September 2014: *temporary* **245,000 EFPH**;[17]
- July 2015: **247,000 EFPH**;
- September 2018: **300,000 EFPH;**
- Current Request: **310,000 EFPH.**[18]

In the last 12 years, Bruce Power has sought authorization to increase the EFPH at the NPGS by 100,000 hours. The CNSC Staff CMD notes:

> During the construction of CANDU reactors, pressure tubes were designed and assembled to satisfy functional and economic life requirements for at least the equivalent of 210,000 EFPH of operation, which is roughly equivalent to 30 years of operation at a capacity factor of 80 percent. The term "effective full power hours" is sometimes used interchangeably with the same intended meaning as the "equivalent full power hours". The original target of 210,000 EFPH was an operational target and not a safety limit; nuclear power plant operators must continue to meet the safety requirements set by the design standards irrespective of the operational target.[19]

While the original target of 210,000 EFPH was an operational target and not a safety limit, the intervenor submits that original target should have been viewed as a safety limit by the Commission. Just three years after the EFPH was increased to 300,000, the pressure tubes at Bruce Power exceeded the Heq concentration limits, revealing operating stress on aging pressure tubes as the operating capacity had heavily increased between 2014 and 2018.

Had the precautionary principle been applied in previous licensing applications, the EFPH may not have been increased so severely in the timeframe of these pressure tubes reaching their refurbishment timeframes, and the exceedance of 120 ppm of Heq concentration within the deteriorating pressure tubes could have been prevented. When reviewing Bruce Power's application and the Staff CMD, there are very reports and studies that have yet to be either completed, or submitted, to the Commission regarding safety and operation studies surrounding pressure tubes (to be discussed below). With studies and reports being unavailable for the Commission to assess during the Hearing in Writing for this application, the intervenor submits

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[17] CNSC, 2015 "Record of Decision: Application to Renew the Power Reactor Operating Licences for Bruce A and Bruce B Nuclear Generating Stations (July 9, 2015), online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/2015-04-14-CompleteDecision-BrucePower-e-edoc4798838.pdf/object at para 4

[18] CNSC Staff, CMD 26-H103 at page 5

[19] CNSC Staff, CMD 26-H103 at page 5

the precautionary principle must be applied to the assessment of Bruce Power's application to ensure Bruce Power is operating in a way that will not bring harm to human or the environment.

> **Recommendation No. 1:** The Commission must apply the precautionary principle to the assessment of Bruce Power's application to operate Units 7 and 8 pressure tubes up to 310,000 EFPH.

(b) Public Transparency & the Use of Hearings in Writing

The intervenor submits the use of a hearing in writing to consider operating pressure tubes up to 310,000 EFPH is inappropriate and is contrary to the public interest. For a hearing in writing, the public is generally permitted to provide written submissions, and the CNSC may provide participant funding to assist Indigenous Nations and communities, members of the public and interested parties to review hearing documents and prepare submissions. Once a member of the public submits their written intervention however, that is end of the public participation process. The public does not have the opportunity to hear any discussion surrounding interventions, and cannot provide oral submissions to help bring clarity to issues before the Commission.

A hearing in writing consists of the Commission reading through documents on the record, and writing up a decision shortly after. These hearings move quicker than a full public hearing, and are administrative in nature. While a hearing in writing may seem appropriate for small changes to licencing conditions, more often than not, these types of hearings preclude the public from having a full understanding of what potential risks and impacts are being weighed by the Commission when they deliberate a licensee's application.

A hearing in writing is more likely to go unnoticed in the public eye, compared to a public hearing that is held in person, or even remotely, as there is less outward-facing planning for it (e.g., there is no venue selected within the affected host community). As a result, it is less likely that members of the public are aware that there is a hearing in writing scheduled, and that they are entitled to voicing concerns through a written submission. The last time Bruce Power sought authorization to change the EFPH of the NPGS was during a two part, in person public hearing in 2018.[20] In 2018, the request to operate Bruce NPGS up to 300,000 EFPH, from 240,000 EFPH, was more at the forefront of the public's attention, since this issue was raised during the 10-year licence renewal hearing, and thus affording more opportunity for the public to engage with the issue.

Additionally, as CNSC staff noted in their submission, the participant funding program was only utilized by three groups/organizations: CELA, Saugeen Ojibwe Nation (SON), and Dr. Frank

[20] CNSC, "Record of Decision: Application to Renew the Power Reactor Operating Licence for Bruce A and Bruce B Generating Stations" (September 27, 2018), online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/Decision-BrucePower-Relicensing2018-e.pdf/object

Greening (funding award not claimed).[21] At the time of this submission being drafted, there are no written comments from other members of the public.

As previously stated, the application before the Commission is requesting a significant increase in the maximum Equivalent Full Power Hours for Units 7 and 8, especially during a time when Bruce Power is conducting testing and undergoing Major Component Replacement. The intervenor submits an in-person hearing would be more appropriate for this application, to promote public transparency and adequate public participation. This would have enabled more members of the public to express concerns and raise questions that would shape the Commission's perspective of the potential impacts associated with operating pressure tubes beyond 300,000 EFPH while they need to undergo refurbishment. The intervenors submit hearings in writing should not be the default for licence basis amendments, and there must be a consideration of how the public will be impacted by the use of a hearing in writing.

> **Recommendation No. 2:** The use of a hearing in writing to consider operating pressure tubes up to 310,000 EFPH is inappropriate and is contrary to the public interest.
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> **Recommendation No. 3:** Hearings in writing should not be the default for licence basis amendments, and there must be a consideration of how the public will be impacted by the use of a hearing in writing.

(c) Elevated Heq Concentrations in Pressure Tubes Raises Safety Concerns & Fitness for Service

The intervenor is concerned about the extra strain on aging components (i.e., pressure tubes) within Bruce B should the Commission allow Units 7 and 8 to operate beyond 300,000 EFPH.

As previously noted, 2021 brought the discovery of elevated Heq concentration in pressure tubes operating beyond 210,000 EFPH. These concentrations "were discovered near the outlet round joint (ORJ) burnish mark as well as the inlet rolled joint (IRJ) burnish mark of the pressure tubes."[22] Following this discovery, new licence conditions were introduced for OPG and Bruce Power while both licensees carried out an extensive research and development (R&D) program to validate models to ensure continued safe operation.[23]

In an update on the R&D program, CNSC staff note the following:

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[21] CNSC Staff, CMD 26-H103, at page 21

[22] CNSC Staff, "CNSC Staff update on the status of licensee R&D program for elevated hydrogen equivalent concentration in the pressure tubes of reactors in extended operation" (CMD 26-M10) at page 2 **[CMD 26-M10]**

[23] CNSC Staff, CMD 26-M10 at page 2

> At the time, the pressure tube fracture toughness model was developed using empirical data from material with Heq levels up to 120 ppm, while the fuel channel end-of-life (EOL) Heq levels were expected to reach up to 160 ppm….Based on the Bruce Power elevated Heq events in 2021, Bruce Power concluded that **some pressure tubes were operating with Heq levels exceeding 120 ppm in the inlet and outlet regions and that the fuel channel EOL Heq levels would exceed 160 ppm.** Following two Commission hearings held in March 2023 and February 2024, the Commission concluded that the basis for operating pressure tubes beyond 210,000 EFPH had evolved and that LC 15.3 no longer served its intended purpose. Therefore, the Commission approved the removal of LC 15.3 from the PROLs and replaced it with a new LC 6.2 (DEC 23-H103, DEC 24-H5). LC 6.2 of the OPG and Bruce Power PROLs require the licensees to implement and maintain an enhanced fitness for service program to support safe operation of pressure tubes in extended operation and require the licensees to report on the status of the R&D activities.[24]

One of the requirements of the R&D program activities was to "…further refine Heq diffusion modelling processes and the fracture toughness model for front-end material for Heq greater than 100 ppm."[25] Of all the required Heq R&D activities, there appears to be one outstanding: develop a comprehensive Heq predictive model by the Spring of 2026.[26] This modelling was not available for discussing during the Commission Member meeting on March 24, 2026,[27] nor was it mentioned or referenced within either Bruce Power's application or the CNSC Staff CMD. The intervenor is left to believe this modelling either has not been submitted to the CNSC on time, or CNSC staff did not have the opportunity to review it before the CMD was published for this hearing.

The intervenor submits this modelling is extremely valuable for understanding how pressure tubes will hold up prior to being taken offline. Because this modelling was not expected to be completed until spring 2026, Bruce Power should have refrained from submitting this application to ensure the modelling was available for review by CNSC staff, intervenors, and Commission members. The intervenor submits a determination on increasing the operation of Units 7 and 8 over 300,000 EFPH should not be made without reviewing the finalized models to ensure pressure tubes will not be subject to excess Heq concentrations.

In addition to this R&D activity being unavailable for review, there are a number of other requests, measures, and studies that are unavailable for the Commission to assess within the context of an increased Equivalent Full Power Hour for Units 7 and 8. For example, Bruce Power has made a request that the intervenors submit should have been a part of this application for public review.

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[24] CNSC Staff, CMD 26-M10 at page 3, *emphasis added*
[25] CNSC Staff, CMD 26-M10 at page 4
[26] CNSC Staff, CMD 26-M10 at page 5
[27] CNSC, Commission Public Meeting Transcript, March 24, 2026 [Transcript]

According to CNSC Staff, "…currently no pressure tubes in Units 7 and 8 operating above the concentration of 100 ppm limit in the body of tube, which is the current limit for the Heq for these dispositions. Bruce Power has recently submitted a request to increase the limit to 120 ppm for CNSC acceptance; CNSC staff are reviewing this request."[28] One of the limitations of this hearing being in writing is that the Commission is limited to the materials before them; there is no active dialogue between Commission members, CNSC staff, the licensee, or to a limited extent, intervenors. As a result, the Commission cannot ask why Bruce Power is seeking an increase in the limit of Heq concentrations to 120 ppm, and consider that in the determination of an limit of 310,000 EFPH operations.

The following are Fitness for Service elements that are also incomplete/unavailable for review:

Pressure Tube Diametral Expansion

Monitoring pressure tube diametral expansion is part of dimensional inspections performed during outages. Currently, CNSC staff are satisfied that Bruce Power is complying with this monitoring, and that Bruce Power is taking appropriate measures to ensure that the pressure tube diameter remains. Within design limits.[29]

CNSC Staff note: "Bruce Power will be taking measurements during the Unit 8 2028 spring outage and is required to submit an updated assessment after this outage, as per CSA N285.4. If Bruce Power is unable to demonstrate that the inner diameter of the pressure tubes meets design requirements, mitigating action will be taken by Bruce Power for continued operation."[30] The intervenor submits that the application of the precautionary principle would preclude the Commission from allowing Bruce Power to operate Units 7 and 8 up to 310,000 EFPH without certainty that the updated assessment reveals the pressure tubes meet design requirements. This determination must wait until after Units 7 and 8 are taken offline for major component replacement.

Spacer Nip-Up

CNSC staff explain that spacer nip-up occurs when the pressure tube diametral creep causes the annulus spacer to contact the full circumference of the calandria tube, and the calandria tube was not designed to withstand this type of internal load from the spacer.[31] While Bruce Power has currently assessed that there spacer nip-up will not occur until at least 300,000 EFPH, there is no guarantee that nip-up will not occur prior to 310,000 EFPH:

[28] CNSC Staff, CMD 26-H103 at page 12
[29] CNSC Staff, CMD 26-H103 at page 10
[30] CNSC Staff, CMD 26-H103 at page 10
[31] CNSC Staff, CMD 26-H103 at page 14

> Bruce Power has committed to providing an updated assessment of spacer nip-up to demonstrate that nip-up will not occur until after 310,000 EFPH. If Bruce Power cannot demonstrate that nip-up will not occur prior to 310,000 EFPH, Bruce Power will need to undertake mitigating actions such as selective defueling, or single fuel channel replacement (SFCR).[32]

The intervenor submits Bruce Power must demonstrate that nip-up will not occur prior to 310,000 EFPH before the Commission can make a determination on this matter.

Spacer Integrity

The integrity of the annulus spacers must be demonstrated in order to ensure the validity of assessments of Pressure Tube to Calandria Tube (PT-CT) contact.[33] Presently, Bruce Power has "…assessed the integrity of spacers to 285,000 EFPH and has performed sensitivity studies with increased spacer material property degradation to beyond the Unit 8 MCR. The sensitivity study has significant margin on structural integrity. Bruce Power intends to remove a spacer in the Unit 8 outage in spring of 2028 to further validate the model and their predictions."[34] The intervenor notes the integrity of spacers to 300,000 EFPH has not been assessed, and yet Bruce Power is requesting the limit be for operations be extended to 310,000 EFPH. The intervenor submits before the Commission grants the application to extend operation to 310,000 EFPH, Bruce Power must ensure all fitness for service assessments and monitoring processes can handle 300,000 EFPH.

The intervenor submits there is too much uncertainty with the research and development project, and the fitness for service program for the Commission to assess the safety aspect of Units 7 and 8 extending their operations up to 310,000 EFPH prior to going offline for refurbishment activities.

> **Recommendation No. 4:** The comprehensive Heq predictive modelling and fracture toughness modeling should have been ready for review prior to Bruce Power submitting its application to the Commission. A determination on increasing the operation of Units 7 and 8 over 300,000 EFPH should not be made without reviewing the finalized models to ensure pressure tubes will not be subject to excess Heq concentrations.

> **Recommendation No. 5:** Bruce Power's request to increase the limit to 120 ppm should have been part of the application requesting to extend Units 7 and 8's operations up to 310,000 EFPH. The Commission cannot make a determination that it will be safe to approve Bruce Power's EFPH request while Bruce Power is also separately seeking to increase the exceedance limit to 120 ppm.

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[32] CNSC Staff, CMD 26-H103 at page 14
[33] CNSC Staff, CMD 26-H103 at page 14
[34] CNSC Staff, CMD 26-H103 at page 15

Recommendation No. 6: The application of the precautionary principle prevents the Commission from allowing Bruce Power to operate Units 7 and 8 up to 310,000 EFPH without certainty that the updated assessment reveals the pressure tubes meet design requirements.

Recommendation No. 7: Bruce Power must demonstrate that nip-up will not occur prior to 310,000 EFPH before the Commission can make a determination on this matter.

Recommendation No. 8: Before the Commission grants the application to extend operation to 310,000 EFPH, Bruce Power must ensure all fitness for service assessments and monitoring processes can handle 300,000 EFPH.

Recommendation No. 9: There is too much uncertainty with the research and development project, and the fitness for service program for the Commission to assess the safety aspect of Units 7 and 8 extending their operations up to 310,000 EFPH prior to going offline for refurbishment activities.

(d) Reviewing Recent Inspection Findings and Updates on Major Component Replacement Procedures

i. SCA Compliance

When assessing whether extending Bruce's operations to operate up to 310,000 EFPH would contravene section 24(4) of the NSCA, the Commission must consider compliance with CNSC Safety and Control Areas (SCAs). The intervenor reviewed the *Regulatory Oversight Report for Canadian Nuclear Power Generating Sites for 2024*[35] (2024 ROR) to consider Bruce Power's compliance with SCAs and other CNSC regulations. As discussed below, there are a number of issues arising from the 2024 ROR that raise concerns about the safety of Bruce NPGS.

For instance, in 2024, Bruce NPGS underwent 80 inspections (1 Type 1 inspections; 19 Type 2 inspections; 2 desktop inspections; and 58 field inspections), resulting in a total of 427 findings related to SCA compliance. Of these findings, 326 were compliant, meaning 101 were non-compliant with SCAs.[36] Despite nearly one quarter of these findings from CNSC staff inspections being non-compliant, Bruce NPGS received satisfactory ratings across all 14 SCAs. The table below provides an overview of the findings from CNSC staff inspections, indicating the rating of each finding for each SCA. The intervenor has highlighted SCAs in the table with notable non-compliance findings (Management System, Human Performance, Conventional Health and Safety, and Emergency Management and Fire Safety). While 78 of the findings were "negligible", the

[35] CNSC, Regulatory Oversight Report for Canadian Nuclear Power Generating Sites for 2024 (CMD 26-M5) [**2024 ROR**]
[36] 2024 ROR at page 73

intervenor notes these findings were still not compliant with SCA standards, and are worth considering from a cumulative compliance lens.

SCA	Low Significance	Negligible Significance	Compliant
Management System	2	25	110
Human Performance	8	5	56
Safety Analysis	0	0	3
Operating Performance	0	5	29
Physical Design	2	0	3
Fitness for Service	3	5	46
Radiation Protection	0	9	29
Conventional Health and Safety	5	16	11
Environmental Protection	0	0	8
Emergency Management and Fire Protection	1	10	16
Waste Management	0	3	1
Security	2	0	7
Safeguards and Non-Proliferation	0	0	6
Packing and Transport	0	0	1

For the Management System SCA, the 2024 ROR notes that "the non-compliant findings were primarily associated with record completeness and document control."[37] Interestingly, when compared with the findings from the 2023 ROR, Bruce NPGS had a worse compliance rating in 2024 than in 2023: 2023 saw 2 findings of low significance, 15 of negligible significance, and 96 compliant findings.[38] Regardless that the non-compliant finding were associated with record and document keeping, the intervenor submits these types of findings are reflective of the work culture at Bruce Power, as a relaxed approach to maintaining records may trickle into other responsibilities at the site, which could ultimately cause safety concerns.

The Human Performance Management SCA also had worse compliance in 2024 than in 2023 (2023 reported 1 low, 7 negligible, and 46 compliant).[39] The 8 low and 5 negligible findings were "related to personnel training, personnel certification and the human performance program."[40]

Conventional Health and Safety also saw a decline in compliance in 2024. In 2023, the compliance findings were 12 negligible and 11 compliant,[41] while 2024 resulted in 5 low, 16 negligible and

[37] 2024 ROR at page 76
[38] CNSC, Regulatory Oversight Report for Canadian Nuclear Power Generating Sites for 2023 at page 78 [**2023 ROR**]
[39] 2023 ROR at page 79
[40] 2024 ROR at page 77
[41] 2023 ROR at page 89

11 compliant findings. For this SCA, the 2024 ROR noted that "CNSC staff continued to follow up on a NNC related to a decreasing trend in housekeeping identified during the quarterly field inspections."[42]

As for the Emergency Management and Fire Protection SCA, the 2023 ROR reported 2 negligible findings and 11 compliant findings,[43] which is quite the contrast to 2024's 1 low, 10 negligible and 16 compliant findings. The 1 low safety significance finding was the result of emergency drill field inspections by CNSC staff which identified "related to Bruce Power's ability to perform effective and sustained intervention within 15 minutes of being notified of a fire incident."[44]

Based on the overview of these SCA non-compliant findings for 2024, the intervenor submits the Commission must carefully consider and assess how the record keeping and administrative duties at Bruce NPGS could cumulative effect safety practices. With compliance with SCAs seemingly declining in 2024 from 2023, these small incidents add up, and point to a work culture that minimizes the importance of administrative actions that end up being connected to worker safety, emergency planning, and site management. The intervenor recommends the Commission consider SCA non-compliances—even those of low or negligible safety significance—with a cumulative lens to assess whether there is a safe work culture at Bruce Power. With the Major Component Replacement program underway at Bruce Power, and pressure tube studies being conducted, there **must** be a safe work culture that maintains and strives for adequate record-keeping, personnel training, and emergency readiness.

> **Recommendation No. 10:** The Commission must consider SCA non-compliances—even those of low or negligible safety significance—with a cumulative lens to assess whether there is a safe work culture at Bruce Power. With the Major Component Replacement program underway at Bruce Power, and pressure tube studies being conducted, there **must** be a safe work culture that maintains and strives for adequate record-keeping, personnel training, and emergency readiness.

ii. 2025-2026 Event Reporting

While there are currently no RORs available for assessing safety compliance at Bruce Power for 2025 and 2026, thanks to REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, Bruce Power is required to post reported events to the Commission on a quarterly basis. As a result, Bruce Power has a list of reported events from 2019 up until March 2026 published on their website.[45] Looking at what events were reported for 2025-2026, there are a number of events that

[42] 2024 ROR at page 87
[43] 2023 ROR at page 91
[44] 2024 ROR at page 89
[45] Bruce Power, "Reportable Events", online: https://www.brucepower.com/resources/reportable-events/

continue to raise concerns surrounding safe work culture, environmental health, and fitness for service.

In 2025, Bruce Power reported 86 reportable events, and in 2026, there have been 22 reported events so far. Between 2025 and 2026, there were 19 instances of "Hours Work Exceedances", and 4 "Below Minimum Complement" events. Some other concerning reported events between 2025 and 2026 include:

- Pressure Tube Burst Test Result from Artificially Hydrided Burst Test Specimen (2025);
- Domestic Water Release (2025);
- Unit 7 Late Regulatory Predefined Maintenance (2025);
- Bruce B Elevated Tritium Levels (2025);
- 2 Bruce B Environmental Compliance Limit Exceeded (2025);
- Unit 8 High Pressure Service Water Unavailable (2025);
- Unit 7 Unplanned Shutdown (2025);
- 4 Ministry of Labour Critical Injury Reports (2025);
- Bruce A and B Overdue Periodic Inspections (2025);
- Unit 8 Unplanned Reactor Power Change (2026).[46]

The intervenor submits these reportable events must be considered in the Commission's assessment of Bruce Power's application, to ensure there is a holistic approach to determining compliance with health and safety requirements. Looking at these events, the safety of the site's work environment continues to be problematic. The intervenor submits a safe work environment is essential to ensure all health and safety protocols are being followed during testing and refurbishment activities—especially with regard to pressure tube maintenance. Worker fatigue, and failure to complete inspections in a timely manner can influence the way work is completed.

> **Recommendation No. 11:** Reportable events reported by Bruce Power in 2025 and 2026 must be considered in the Commission's assessment of Bruce Power's application, to ensure there is a holistic approach to determining compliance with health and safety requirements.

iii. Major Component Replacement Procedures

According to Bruce Power, this application is "…to provide the operational flexibility to optimize the overall Major Component Replacement (MCR) schedule. Although neither unit is expected to operate to the full 310,000 EFPH, this extension of the licence limit will provide the regulatory certainty and operational margin needed to ensure safe execution of these large refurbishment

[46] Bruce Power, "Reportable Events"

projects."[47] Bruce Power further states that this approval is required because it is projected that Units 7 and 8 will exceed their 300,000 EFPH limit before their MCR outage.[48] According to table 1 in Bruce Power's Application, Unit 7 is currently operating at 278,500 EFPH and is projected to be at 305,500 EFPH by the MCR outage. Meanwhile, Unit 8 is currently operating at 263,600 EFPH, and is projected to reach 304,500 EFPH by the MCR outage.[49]

The intervenor submits the previous elevated Heq concentrations indicate the pressure tubes at Bruce Power have been used beyond their safe life span, and should be replaced before they exceed 300,000 EFPH. From the precautionary principle perspective, the multiple requests to extend the operating EPFH since 2014 have caused undue stress on these pressure tubes, putting operational safety at risk. The intervenor recommends the Commission require the MCR outage occur before the units exceed 300,000 EFPH.

Additionally, when considering safety and proposed MCR, it is essential that MCR activities are completed with worker safety at its core. When reviewing the 2024 ROR, there was a troubling note surrounding the major component replacement (MCR) process from a safety perspective:

> Due to observations at the beginning of Unit 3 MCR, CNSC staff raised Action Item 2023-07-30964 to address a trend of events in the area of contractor safety performance. In 2024, Bruce Power demonstrated that corrective actions had been taken, they were shown to be effective and had been implemented in governance to sustain the improved performance during future MCRs. This Action Item has been closed and CNSC staff continue to monitor this area.[50]

While the intervenor is relieved that corrective actions were taken, we note the recurring theme of safety performance at Bruce Power. While this incident involved contractor work for the MCR initiative (rather than Bruce Power employees), there is the concern that this NPGS lacks a work environment that closely monitors housekeeping and safety practices for all individuals working on site. The intervenor reiterates that the Commission must consider the safety work culture at Bruce NPGS when considering an extension of Pickering B operating EFPH limits.

> **Recommendation No. 12:** From the precautionary principle perspective, the multiple requests to extend the operating EPFH since 2014 have caused undue stress on these pressure tubes, putting operational safety at risk. The intervenor recommends the Commission require the MCR outage occur before the units exceed 300,000 EFPH.

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[47] Bruce Power Application at page 1
[48] Bruce Power Application at page 3
[49] Bruce Power Application at page 11, Table 1
[50] 2024 ROR at page 75

Recommendation No. 13: The Commission must consider the safety work culture for contractors and employees of Bruce NPGS when considering increasing the limit on Equivalent Full Power Hours.

(e) KI Pill Distribution

When reviewing the materials for this application, there is no discussion of emergency planning for nuclear power generation, including one emergency planning area that is frequently overlooked during licencing hearings: the availability of potassium iodide (KI) pills. KI is an effective blocker of thyroid radioiodine uptake and if ingested at the right time, can reduce the risk of thyroid cancer following an offsite release of radioactive molecules. The intervenor submits that with Bruce Power seeking to experiment with operating these aging units beyond 300,000 EFPH before they are shut down for MCR programming, the Commission must ensure that there is adequate safety measures in place for the communities surrounding Bruce Power.

Currently, residents that live within a 10 km radius of Bruce Power are given a supply of KI pills, and residents within a 50 km radius of Bruce Power have the opportunity to obtain the pills at participating pharmacies across the region.[51] For the Bruce A and B Reactor Relicensing Hearing in 2015,[52] as well as for the Bruce Power Refurbishment Hearing in 2018,[53] CELA expressed concerns about the distribution of KI pills across the region. While the Bruce Power website notes that it has provided all residents within 50 km an information packages on KI pills and a voucher for the tablets and encouraged to obtain them,[54] the current 10 km pre-distribution (governed by the current primary zone distance, which is arbitrary) excludes pre-distribution of KI pills to the residents of Kincardine. Once again, CELA recommends that KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.

CELA reiterates its recommendation from 2018 that Bruce Power be required to adopt Toronto's mechanism that allows people in the 50km area to order KI online via a joint City of Toronto-OPG site called "Prepare to be Safe."[55] The online Prepare to Be Safe site allows residents to enter their postal code and if located within the 50 km region, a link is provided to an online form where they

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[51] Be Prepared Grey Bruce Huron, "Potassium Iodide (KI) Distribution", online: https://www.bepreparedgreybrucehuron.com/ki-tablet-distribution/

[52] *See* CELA, "Bruce A and B Reactor Relicensing and the Emergency Management Regulatory System: Submission by the Canadian Environmental Law Association" (March 16, 2015), online: https://cela.ca/wp-content/uploads/2019/07/Hearing_2015-H-02-CELA_Submissions_to_CNSC_re_Bruce_Power_Relicensing.pdf

[53] *See* CELA, "Bruce Power's Proposed Life Extension and Refurbishment: Evaluating Emergency Preparedness and Environmental Protection" (April 16, 2018), online: https://cela.ca/wp-content/uploads/2019/07/1185LicRenBrucePwr.pdf

[54] Bruce Power, "Community Safety Guide, KI distribution enhancing emergency preparedness in Grey, Bruce and Huron", (March 20, 2025) online: https://www.brucepower.com/2025/03/20/community-safety-guide-ki-distribution-enhancing-emergency-preparedness-in-grey-bruce-and-huron/

[55] "Prepare to be Safe", online: http://www.preparetobesafe.ca/

can order KI pills. Within 6 weeks, KI pills are delivered to their mailbox. This online mechanism is much more accessible than having to arrange for a package of KI pills and physically pick them up at select locations, as is the current process outlined on the "Be Prepared Grey Bruce Huron" website.[56]

By facilitating the availability of KI in the 50 km region would allow Bruce Power to partially mirror what is already done in other jurisdictions who currently pre-distribute KI out to 50 km. For example, in Switzerland KI is distributed within 50km of each plant as a precautionary measure.[57] In 2016, Belgium's Superior Health Council recommended that "based on the experience of past accidents, the areas covered by the plan for sheltering, the distribution of stable iodine and evacuation [should] be extended to cover realistic distances.[58] We continue to encourage the CNSC to require licensees to provide KI by way of pre-distribution within a 50 km radius, and pre-stock to 100 km.

With this past spring having marked 15 years since the tragic Fukushima Daiichi nuclear disaster, having precautionary emergency measures in place is crucial. Regulators involved in the Fukushima incident have said publicly that the severe consequences of the accident at Fukushima, and the inability to protect people, were in large part due to the assumption by the regulators and the industry that such a large accident would never occur. That assumption resulted in a failure to put in place appropriate measures to respond to such an accident.[59] CELA maintains that the inadequate pre-distribution of KI pills is a major gap in emergency preparedness that should not be underestimated because there is an assumption that a major nuclear disaster could not possibly unfold in Canada. Allowing aging NPGS units that require major component replacements to operate at a higher EFPH requires robust emergency planning for the public's health and safety in the worst case scenario.

> **Recommendation No. 14:** KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.
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> **Recommendation No. 15:** The CNSC should require Bruce Power provide an online KI-pill request mechanism which is equivalent to the current "Prepare to Be Safe" website

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[56] "Prepare to be Safe"

[57] Secretariat of the Swiss Iodine Tablets Office, "Distribution of iodine tablets: a precautionary measure", online: https://jodtabletten.ch/en

[58] Superior Health Council, Conseil Supérieur de la Santé, Conseil Supérieur de la Santé Accidents nucléaires, environnement et santé après Fukushima. Planification d'urgence, AVIS DU CONSEIL SUPERIEUR DE LA SANTE N° 9235, February 2016, online: https://www.hgr-css.be/file/download/995fe8a7-0031-4241-b885-f64379fe11e9/hmIBibV5TBeVjNw62MjYLOXgpzUIgw5D0h5HwP8nA03d.pdf

[59] CELA, "Ten Years Later – Reflections on Emergency Preparedness on the Anniversary of Fukushima" Blog (May 27, 2021), online: https://cela.ca/ten-years-later-reflections-on-emergency-preparedness-on-the-anniversary-of-fukushima/

used by OPG for the Pickering and Darlington nuclear power plants for all individuals in the 50 km zone.

Recommendation No. 16: The CNSC should extend KI stockpiles to 100 km and ensure stockpiles at places frequented by vulnerable groups, such as children and pregnant women, are maintained.

VI. ORDER REQUESTED

For the foregoing reasons provided in this submission, we request the CNSC issue an order:

(1) Granting CELA the status of intervenor;

(2) Making a determination that the amendment of the licensing basis of the power reactor operating licence for the Bruce A and B nuclear generating stations to operate up to 310,000 EFPH should not be granted on the grounds that there is not enough information before the Commission to make a determination that the request by Bruce Power would not pose a risk to the health and safety of the public and the environment.

Sincerely,

CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Sara Libman

Sara Libman, Legal Counsel to CELA

SUMMARY OF RECOMMENDATIONS

Recommendation No. 1: The Commission must apply the precautionary principle to the assessment of Bruce Power's application to operate Units 7 and 8 pressure tubes up to 310,000 EFPH.

Recommendation No. 2: The use of a hearing in writing to consider operating pressure tubes up to 310,000 EFPH is inappropriate and is contrary to the public interest.

Recommendation No. 3: Hearings in writing should not be the default for licence basis amendments, and there must be a consideration of how the public will be impacted by the use of a hearing in writing.

Recommendation No. 4: The comprehensive Heq predictive modelling and fracture toughness modeling should have been ready for review prior to Bruce Power submitting its application to the Commission. A determination on increasing the operation of Units 7 and 8 over 300,000 EFPH should not be made without reviewing the finalized models to ensure pressure tubes will not be subject to excess Heq concentrations.

Recommendation No. 5: Bruce Power's request to increase the limit to 120 ppm should have been part of the application requesting to extend Units 7 and 8's operations up to 310,000 EFPH. The Commission cannot make a determination that it will be safe to approve Bruce Power's EFPH request while Bruce Power is also separately seeking to increase the exceedance limit to 120 ppm.

Recommendation No. 6: The application of the precautionary principle prevents the Commission from allowing Bruce Power to operate Units 7 and 8 up to 310,000 EFPH without certainty that the updated assessment reveals the pressure tubes meet design requirements.

Recommendation No. 7: Bruce Power must demonstrate that nip-up will not occur prior to 310,000 EFPH before the Commission can make a determination on this matter.

Recommendation No. 8: Before the Commission grants the application to extend operation to 310,000 EFPH, Bruce Power must ensure all fitness for service assessments and monitoring processes can handle 300,000 EFPH.

Recommendation No. 9: There is too much uncertainty with the research and development project, and the fitness for service program for the Commission to assess the safety aspect of Units 7 and 8 extending their operations up to 310,000 EFPH prior to going offline for refurbishment activities.

Recommendation No. 10: The Commission must consider SCA non-compliances—even those of low or negligible safety significance—with a cumulative lens to assess whether there is a safe work culture at Bruce Power. With the Major Component Replacement program underway at Bruce Power, and pressure tube studies being conducted, there **must** be a safe work culture that maintains and strives for adequate record-keeping, personnel training, and emergency readiness.

Recommendation No. 11: Reportable events reported by Bruce Power in 2025 and 2026 must be considered in the Commission's assessment of Bruce Power's application, to ensure there is a holistic approach to determining compliance with health and safety requirements.

Recommendation No. 12: From the precautionary principle perspective, the multiple requests to extend the operating EPFH since 2014 have caused undue stress on these pressure tubes, putting operational safety at risk. The intervenor recommends the Commission require the MCR outage occur before the units exceed 300,000 EFPH.

Recommendation No. 13: The Commission must consider the safety work culture for contractors and employees of Bruce NPGS when considering increasing the limit on Equivalent Full Power Hours.

Recommendation No. 14: KI pills should be pre-distributed to everyone within 50 km of the plant and selectively pre-distributed to vulnerable communities within 100 km.

Recommendation No. 15: The CNSC should require Bruce Power provide an online KI-pill request mechanism which is equivalent to the current "Prepare to Be Safe" website used by OPG for the Pickering and Darlington nuclear power plants for all individuals in the 50 km zone.

Recommendation No. 16: The CNSC should extend KI stockpiles to 100 km and ensure stockpiles at places frequented by vulnerable groups, such as children and pregnant women, are maintained.