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Supplementary Information

Presentation from the Durham Nuclear Awareness, Slovenian Home Association, and the Canadian Environmental Law Association

In the matter of the

Ontario Power Generation Inc.

Application to renew power reactor operating licence for the Darlington Nuclear Generating Station

Commission Public Hearing
Part-2

June 24-26, 2025

Renseignements supplémentaires

Présentation de Durham Nuclear Awareness, Slovenian Home Association et de l'Association canadienne du droit de l'environnement

À l'égard d'

Ontario Power Generation Inc.

Demande concernant le renouvellement du permis d'exploitation d'un réacteur de puissance pour la centrale nucléaire de Darlington

Audience publique de la Commission
Partie-2

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Canada

Comments on Ontario Power Generation's Application to Renew Power Reactor Operating Licence for the Darlington Nuclear Generating Station for a 30-Year Term

CNSC Hearing Reference 2025-H-02

Sara Libman, Legal Counsel

June 2025

Canadian Environmental Law Association
EQUITY. JUSTICE. HEALTH.

Photo: Sara Libman

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Canadian Environmental Law Association (CELA)

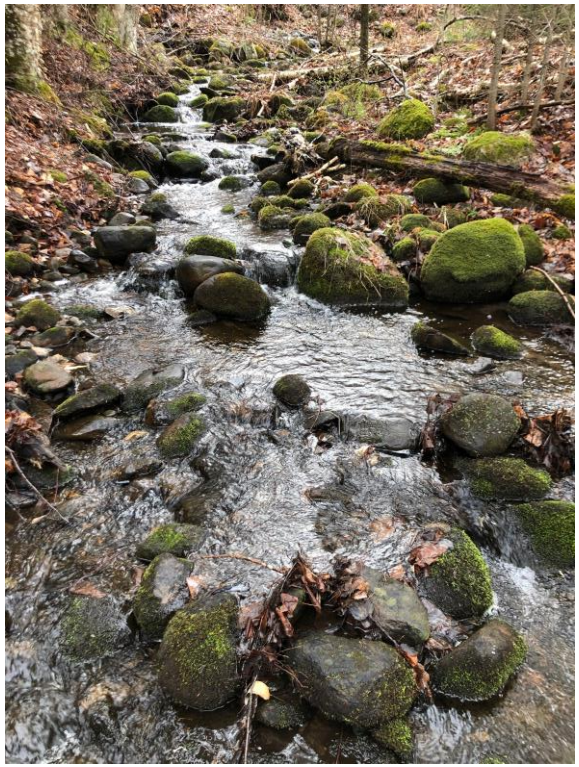

Photo: Kelly Mathews

- Specialty legal aid clinic dedicated to environmental equity, justice, and health
- Founded in 1970, funded by Legal Aid Ontario since 1978
- CELA provides free legal services relating to environmental justice in Ontario, including representing qualifying low-income and vulnerable communities in the courts and before tribunals. CELA also provides free summary advice to the public and engages in legal education and law reform initiatives.

I. Interest and Expertise of the Intervenors

Durham Nuclear Awareness (DNA) is a citizens' group with a longstanding interest in the Darlington Nuclear Generating Station. DNA was first organized in 1986 in the wake of the Chernobyl disaster and born out of a need for people in Durham Region to come together, learn & empower themselves. As a volunteer group of concerned citizens, DNA dedicates themselves to raising public awareness about nuclear issues facing Durham Region, and fostering greater public involvement in the nuclear decision-making process.

Slovenian Home Association (SHA) is a non-profit cultural organization dedicated to the preservation of Slovenian culture language, heritage and identity in Canada. Many Slovenians reside in the vicinity of the Pickering and Darlington nuclear plants and are concerned about the proposed plans to expand nuclear power generation within the region, particularly with OPG proposing novel reactor technology at the Darlington site. Much of these concerns stem from emergency planning for nuclear accidents.

Expert Retained for Technical Review:

Dr. M.V. Ramana is a Professor and the Simons Chair in Disarmament, Global and Human Security at the School of Public Policy and Global Affairs (SPPGA), University of British Columbia. M. V. Ramana has extensive experience with examining various aspects of the safety of nuclear reactors, and has published many articles on these topics in journals such as Journal of Risk Research, Science and Global Security, Regulation & Governance, and Bulletin of the Atomic Scientists.

Dr. Ian Fairlie is an independent scientist who has specialized on radioactivity in the environment with degrees in chemistry and radiation biology. One of Dr. Fairlie's areas of expertise is the dosimetric impacts of nuclear reactor emissions.

II. Scope of Review

Photo: Sara Libman

- Our findings and recommendations aim to advance the object of the CNSC and are directly relevant to the CNSC's licensing powers under **section 24(4) of the NSCA** to ensure the applicant 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."*

III. Summary of Findings

Photo: Sara Libman

- The CNSC should **deny OPG's request** to renew the Darlington PROL for a 30 year term.
- Within the relevant documents associated with OPG's application, the intervenors identified several areas of concern that would contravene the aforementioned objective of the CNSC, namely:
  - insufficient public participation opportunities;
  - inadequate emergency planning and evacuation planning measures;
  - inadequate consideration of environmental and climate change impacts;
  - risks associated with operating a nuclear reactors for 30 year terms; and
  - risks to human health associated with radioactive releases.
- In the interest of **protecting the environment** and **ensuring public health and safety**, the intervenors submit that the Commission cannot, in good conscience, approve the renewal of the Darlington Power Reactor Licence for a 30-year term.

IV. Detailed Findings

OPG's request for a 30-Year Licence is contrary to the public interest and erodes public trust

Public Oversight and Participation

- Such a long licence period will remove the "regular opportunities" for stakeholders to "voice their perspectives and concerns directly to the decision maker."
- Approving OPG's renewal request would remove the opportunity for a public hearing under **section 40(1) of the NSCA** for *three* decades, shielding OPG's activities at Darlington from public hearings until 2055.
- IAEA notes that: "increased public participation in decisions can promote a greater degree of understanding of the issues and can help to develop appreciation of the actual risks and benefits of nuclear technologies, such as those found in nuclear energy, compared with the risks and benefits of other energy sources."
- A 30-year licence term would minimize public scrutiny of licence operations and access to information because of the duration of time between hearings and the accompanying lack of meaningful ways for the public to engage with the Commission and licensee.
- Even CNSC Staff acknowledge that there is a risk of eroding public trust with the issuance of longer licencing terms:
    - "With the recommendation of a longer licencing term, CNSC staff acknowledge there is a risk of eroded trust and relationships with Indigenous Nations and communities and the public, the same concern as was seen with the re-licensing of the Point Lepreau Nuclear Power Plant in 2022 and Cameco's McArthur River/Key Lake uranium mine and mill in 2023 where staff supported 20-year terms."

OPG's request for a 30-Year Licence is contrary to the public interest and erodes public trust, *continued*

Regulatory Framework and Oversight

- We do not accept CNSC Staff's position that a 30-year licence term is justified based on improvements to the regulatory framework and oversight practices of the CNSC.
- RORs are *not* an appropriate alternative to more regular, site-specific licensing hearings.
  - A public hearing before the CNSC provides greater procedural rights and protections than other CNSC forums, such as the annual Regulatory Oversight Reports ("ROR") and meetings.
  - Unlike licence renewal hearings, the procedural rights for the public under **section 24(4) of the NSCA** do not apply to RORs.
- There are several gaps in the SCA framework which often result in less than comprehensive oversight of licenced activities and limit CNSC staff's assessment of those activities.
  - E.g., limits of Waste Management SCA
- A complaint about an activity at Darlington may warrant a licence amendment; however, licence amendments are not always subject to public hearings. And when these hearings are held, they are often in writing and are often not funded. As a result, meaningful engagement and comments from the public are not included in the process to amend the licence.

OPG's request for a 30-Year Licence is contrary to the public interest and erodes public trust, *continued*

International Precedents

- It would be contrary to the public interest to accept CNSC staff's recommendation for a 30-year licencing term based on international precedents.
- Nuclear licencing procedures in other jurisdictions are quite prescriptive compared to Canada's highly subjective approach.
  - The CNSCs licencing scheme is so heavily reliant on guidance principles and non-binding language that it is very difficult for an observer to tell what is sufficient under the Act and regulations.
  - The use of non-binding language (e.g. "should" or "may" instead of "shall" or "must") in REGDOCs makes it difficult to discern the threshold of information the CNSC would consider to be sufficient to address a listed area of concern.
- CNSC Staff also justify their recommendation for a 30-year licence period based on a claim that "*the duration of a licence is largely a legal/administrative matter and has no bearing on safety performance*" but the reference for this claim is a document from 2000, well before the multiple reactor meltdown at the Fukushima Daiichi nuclear plant and the lessons for nuclear safety from those severe accidents.

A 30-Year Licence is not compatible with existing emergency response and preparedness measures for Darlington

Jurisdiction and authority

- The CNSC's jurisdiction includes considering the adequacy of the emergency plans in place at nuclear power plants. Therefore, in deciding whether to issue the licence requested, and/or whether to impose additional requirements by way of licencee conditions to better protect health, safety and the environment, the adequacy of off-site emergency response must be reviewed.
- The CNSC is the *only* licensing authority in Canada for nuclear power plants and should ensure that licences are not issued without adequate assurance of the sufficiency of off-site emergency planning and that the public and environment will be protected in the event of a radiological emergency.
- The NSCA requires the CNSC to limit risk to Canadian society in the event of a nuclear accident.

Population growth and evacuation

- One of the major concerns with requesting a 30-year term to operate Darlington NGS is uncertainty around population growth projected for the region over the course of three decades.
- During a 10-year licence period, an ETE study may be updated once or twice, depending on timing. With that timeframe, it is not too difficult to see how evacuation timing might be impacted by future infrastructure projects (e.g., highway improvement projects) or a slight increase in population, and therefore it is easier for the Commission to assess whether the ETE study will adequately protect the public in the event of an emergency.
- But with a 30-year licence term, there are too many uncertainties surrounding population growth, the policies and priorities of future municipal and provincial governments shaping the development of the region, and how infrastructure and emergency services will be operating 30-years into the future.
- The Commission should apply the **precautionary principle** when assessing emergency planning and evacuation measures for a PROL renewal application, especially when an applicant is seeking a 30-year term.

A 30-Year Licence is not compatible with existing emergency response and preparedness measures for Darlington, *continued*

KI Pill Distribution

- We recommend pre-distribution of KI Pills to all residences **within a 50 km radius of Darlington**, and pre-stock and selectively pre-distribute to vulnerable populations within the Ingestion Planning Zone ("IPZ"), which should be **expanded to a 100 km radius**, to align with international best practices

(Lack of) Emergency Preparedness at Darlington Site

- From 2023 ROR: Instance of medium safety significance non-compliance occurred at Darlington in August 2023:
  - a reactive field inspection was conducted by CNSC staff due to an adverse trend regarding the audibility issues of the public address (PA) system throughout the station.
- The intervenors are concerned that the Darlington NGS is not adequately maintaining emergency equipment to safely operate and is not sufficiently prepared for an emergency breaking out at the Darlington site.
- The intervenors request that OPG explain how the PA system at Darlington fell into disrepair and why it was not upgraded in a timely manner.

Public awareness

- Currently, **section 10.1 of the proposed Licence Conditions Handbook** ("LCH") for Darlington NGS states "The licensee should provide emergency communications outlining what surrounding community residents need to know and do before, during and after a nuclear emergency."
- We **recommend** "should" be replaced with the express requirement that "the licensee must provide emergency communications." As currently worded, the LCH leaves the public without a plan should they wish to raise their level of awareness. Also, as a condition of licence renewal, the CNSC should require ongoing public education for emergency preparedness and protective actions.

OPG's licence application fails to adequately address releases to the environment

Regulatory Compliance

- During the current licence term, there were 13 infractions (as of September 30, 2024), most of which were related to Environmental Compliance Approvals (ECAs).
- There is an absence of detailed discussion surrounding OPG's non-compliance at Darlington. The only releases mentioned in either CMD is an action level exceedance for tritium oxide, and 7 ozone depleting substance releases.

Radiological release

- in September 2023, Darlington had an action level exceedance for tritium oxide, in which over double the Action Limit was released
    - 2.4 times the weekly limit. It means that about 7% of the elemental tritium emitted by Darlington TRF in the whole of 2023 was emitted during one incident - a worrying amount.

Non-radiological release

- The licence application materials do not provide much detail on non-radiological releases during the current licence.
- CNSC Staff explain that "ozone depleting substances are used in refrigeration systems, releases between 10 kg and 100 kg are reported to Environment Canada in semi-annual reports."
- With OPG pursuing a 30-year licence term, there is the expectation that preventing any and all releases to the environment should be prioritized, and with seven ozone depleting substance releases occurring during the current licence period, it appears that environmental releases are being overlooked until they become abundant in number of instances. This does not instill confidence in the public that OPG is being diligent with its environmental monitoring. Even if releases are not severe in nature, if they are overlooked, especially over the course of 30 years, there is a risk of cumulative effects building in the local environment.

OPG's licence application fails to adequately consider impacts of climate change

Uncertainty with climate change modelling

- climate considerations are a necessary component of the licence application if the CNSC is to find, pursuant to **section 24(4) of the NSCA**, that the licensee will make adequate protection for human health and the environment.
- It is critical to consider climate vulnerability in the CNSC's review. Potential climate impacts are directly within the purview of the CNSC because of its responsibility to protect people and the environment from unintended radioactive releases.
- Nuclear power plants and associated facilities are particularly vulnerable to climate change effects, including thermal disruptions (e.g., heatwaves and droughts) and extreme weather events.
- Particular consideration should be given to climate impacts and climate resiliency in the CNSC's evaluation of ongoing site suitability. As set out in **REGDOC 1.1.1**, *Site Evaluation and Site Preparation for New Reactor Facilities*, the suitability of a site is to be revisited throughout the lifecycle of the nuclear facility's operations.
- To meet the requirements under **section 24 (4) of the NSCA**, it is critical that detailed climate analysis be presented within the licence application and considered at the hearing. In OPG's CMD, there is mention of the ***intention*** to develop a climate risk assessment
    - OPG does *not* currently have this assessment written to accompany its application for a 30-year term. The intervenors submit that this should have been prepared for this application to be reviewed by the Commission, as well as be available for review and comment by Indigenous groups and communities, and members of the public.

A 30-year term raises concerns surrounding waste management

- Members of the public are concerned about the manner in which nuclear waste is stored, with Darlington's dry storage container system being situated in close proximity to Lake Ontario.
  - As more waste is produced, more storage containers are added in between the current dry storage buildings and Lake Ontario, which increases the vulnerability of these new containers to extreme weather events.
- Currently, there is no long-term disposal of radioactive waste.
  - *"Under the NWMO's plan, a deep geological repository for used fuel is **expected** to be in-service in the mid-2040s."*
  - This means that *if* the deep geological repository is established, it won't be functional until Darlington is nearing the end of the 30-year licencing term.
- The intervenors **submit** that without a permanent and safe disposal site in place for the long-term disposal of radioactive waste, the amount of radioactive waste being produced should be limited.
- Due to the uncertainty surrounding long term disposal of radioactive waste, OPG's long-term waste strategy is essentially non-existent for this application:
  - *"As OPG's waste strategy for permanent disposal continues to evolve over the licence term. OPG will continue to engage with stakeholders and seek amendments to the associated licenses as required."*
- As the intervenors have previously submitted, seeking amendments to the licence does not provide the same fair process for the public to engage with the Commission as a hearing would.

OPG's application fails to address the implications of the Darlington New Nuclear Project on the same site

- Despite their independence in operations, we submit the DNNP ought to have been included in more discussions for this licence application, as its siting on the same lands as Darlington NGS has implications for safety measures and emergency planning.
- Because the BWRX-300 design is in a state of flux and fine-tuning, the intervenors submit that a 30-year licence for the Darlington NGS limits public engagement on how different stages of the DNNP will interact and impact Darlington NGS.
- As the DNNP progresses along (and will eventually seek a licence to operate after the completion of construction), it is important that Darlington NGS has a shorter licence term, to ensure waste management strategies and emergency planning and evacuation time estimates can be discussed with concerned members of the public within the context of the new nuclear reactor being sited in close proximity to Darlington NGS.
- The intervenors recommend that the Commission review this licensing renewal application with the DNNP included in the context of **emergency planning and waste management issues**.
- We further recommend that the 30-year licence term be denied to ensure there are more frequent engagement opportunities to assess how the two nuclear reactor sites are impacting each other.

30- Year Licence Term is Inappropriate for Reactors with Some Aged Components

Photo: Sara Libman

- Refurbishment does not involve the wholesale replacement of all of the parts of a nuclear reactor.
- Older components are more susceptible to failures, which could lead to severe accidents.
- Indeed, the likelihood of accidents and failures at old reactors has often been described by something called the **bathtub curve**.
  - The failure rate is initially high due to manufacturing problems and operator errors associated with new technology. Then curving like a tub, the failure rate declines with experience and rises again as aging related wear and tear starts increasing.
- We **recommend** that CNSC deny a 30-year licence term and only permit a much shorter licence extension, which would allow the public to have more frequent and deeper insight into the rate of failures of components at the Darlington Nuclear Generating Station and its safety.

Implications of Tritium Releases at Darlington NGS (Dr. Fairlie's Expert Report)

- Annual tritium releases from Darlington NGS and its Tritium Recovery Facility (TRF) are large in comparison with other nuclear reactors. Local residents receive radiation exposures from tritium releases to air and to Lake Ontario via tritium ingestion, inhalation, and skin absorption. These increase the probabilities of cancer and other radiogenic diseases.
- Epidemiology studies at other Canadian facilities emitting tritium indicate increases in cancer and congenital malformations. Recent large statistically powerful, epidemiology studies of nuclear workers in UK, US and France have increased the radiation risks of low- LET radiation, including tritium. This is applicable to Darlington NGS' tritium releases. Also, newly available studies indicate increased incidences of child leukemia near NPPs.
- The large tritium emissions, increased estimates of cancer risk and newly available ill- health studies near NPPs together pose health risks to the workers and people living near and downwind from Darlington.
- Under the **Precautionary Principle**, Dr. Fairlie's report recommends that no further licenses be issued for the Darlington NGS.

V. Order Requested

Order Requested

For the foregoing reasons provided in this submission, DNA, SHA, and CELA submit it would be contrary to the responsibility of the Commission to protect the environment and ensuring the health and safety of persons if it were to grant a 30-year licence for the Darlington Nuclear Generating Station, and recommend the CNSC issue an order:

- Denying OPG's request for a 30-year licence on the basis that:
  - A 30-year licence would remove the right to public hearing for a full generation, compromise meaningful public participation in nuclear matters and erode public confidence in both the Commission and the licensee;
  - A 30-year licence would be unjustified given OPG's plans to deploy up to four Small Modular Reactors ("SMRs") at the Darlington site during that timeframe;
  - Off-site emergency planning and preparedness at Darlington Nuclear Generating Station is insufficient to protect human health and the environment;
- Denying CNSC staff's recommendation for a 30-year licence; and
- Directing OPG to revise its licence renewal application, considering all of the deficiencies and recommendations herein.

Summary of Recommendations

Recommendation No. 1: Licence renewals should be subject to shorter licensing terms as it provides the opportunity for public hearings under section 40(1) of the NSCA, and enhances the openness and transparency of the CNSC, and its oversight of nuclear uses and technologies. These opportunities are critical to building the public's trust in the regulator and would be lost if there is only one chance for every generation of the public to participate in a hearing and engage in dialogue with the CNSC and the licencee about their concerns.

Recommendation No. 2: Given their limited scope and exclusion of oral intervention opportunities, Regulatory Oversight Reports and meetings are not sufficient alternatives to licensing hearings and should not be relied upon to remedy outstanding issues resulting from licensing hearings, nor used as a stand-in for public hearings.

Recommendation No. 3: The CNSC should disregard CNSC staff's recommendation for a 30- year licencing term.

Recommendation No. 4: Because CNSC Staff has not carried out and published a more thorough review of legislation and licencing procedures in other jurisdictions, and because some of the literature they have relied on are very old and do not reflect recent understandings of nuclear safety, international precedence and benchmarking do not justify longer term licences in Canada.

Recommendation No. 5: the Commission should apply the precautionary principle to the assessment of Darlington's ETE study, which would require the rejection of a 30-year licence term.

Recommendation No. 6: We encourage the CNSC to require Darlington to provide KI Pills by way of pre-distribution within a 50 km radius, and pre-stock to 100 km. In accordance with international best practice, the CNSC should extend KI Pill stockpiles to 100 km and ensure that places frequented by vulnerable groups, such as children and pregnant women, maintain sufficient stockpiles.

Recommendation No. 7: OPG should explain how the PA system at Darlington fell into disrepair and why it was not upgraded in a timely manner.

Recommendation No. 8: OPG should provide the public with details about how it intends on monitoring the functionality of emergency equipment, and how it is going to ensure that malfunctions of important equipment like the PA system will not occur in the future.

Recommendation No. 9: Licence Conditions Handbook section. 10.1 should be updated to read "licensee must provide emergency communications" and not "should", as currently drafted.

Recommendation No. 10: The CNSC should require ongoing public education for emergency preparedness and protective actions. The CNSC and OPG should collaborate with community groups and intervenors to develop a strategy to better inform the public on what to do in case of emergency.

Recommendation No. 11: OPG should discuss the 13 infractions that occurred during the current licence term in more detail—what the infractions were, when they occurred, why they took place, and what OPG has done to resolve them.

Recommendation No. 12: The Commission needs to hold licensees like OPG accountable with the disclosure of releases into the environment.

Recommendation No. 13: More information surrounding the tritium oxide release is requested, namely how it happened, i.e., what does OPG mean by the vague statement of "*this exceedance was attributed to an event at the Darlington NGS Tritium Removal Facility (TRF) due to issues with the tritium immobilization system?" Was this a preventable incident*? Are there refurbishment activities that need to occur at the TRF to protect the environment from tritium oxide releases?

Recommendation No. 14: More information about the seven ozone depleting substance releases is requested, and clarification as to whether they could have been prevented through proper maintenance and monitoring procedures that did not occur.

Recommendation No. 15: A 30-year term is an inappropriate request amidst the absence of disclosing details surrounding environmental releases.

Recommendation No. 16: The CNSC should review the licence renewal application with express consideration given to climate impacts and climate resiliency, including in the context of site suitability and impacts on safety and the environment.

Recommendation No. 17: The criteria by which climate change impacts and natural external events have been assessed and evaluated against the 25-year licence application must be clearly set out.

Recommendation No. 18: OPG's detailed climate analysis must be presented in a public forum as part of the CNSC's licensing process.

Recommendation No. 19: Without a permanent and safe disposal site in place for the long-term disposal of radioactive waste, the amount of radioactive waste being produced should be limited.

Recommendation No. 20: a shorter licence term is more appropriate to protect and encourage public participation and engagement with issues like radioactive waste storage.

Recommendation No. 21: The Commission should review this licensing renewal application with the DNNP included in the context of emergency planning and waste management issues.

Recommendation No. 22: The 30-year licence term should be denied to ensure there are more frequent engagement opportunities to assess how the two nuclear reactor sites are impacting each other.

Recommendation No. 23: The CNSC should deny a 30-year licence term and only permit a much shorter licence extension, thus allowing the public to have more frequent and deeper insight into the rate of failures of components at the Darlington Nuclear Generating Station and its safety.

Recommendations from Dr. Ian Fairlie's Expert Report

Recommendation No. 24: CNSC should not extend operating licences for Darlington NGS.

Recommendation No. 25: CNSC should apply the Ontario Government's ODWAC recommendation of 20 becquerels per litre (Bq/L) for drinking water

Recommendation No. 26: CNSC should implement its own 2010 design guide for groundwater for tritium of 100 Bq/L for tritium levels in wells near Darlington NPS.

Recommendation No. 27: Urine tests and non-invasive bioassay tests should be carried out on volunteers from the community to ascertain local HTO and OBT levels.

Recommendation No. 28: Residents within 10 km of the plant should be advised to avoid consuming locally-grown foods including honey from hives, wild foods such as mushrooms and berries and produce from their gardens.

Recommendation No. 29: In view of the discussion in Appendix C, local women intending to have a family, and families with babies and young children should consider moving elsewhere. It is recognised this recommendation may cause concern but it is better to be aware of the risks to babies and young children than remain ignorant of them.

Recommendation No. 30: Darlington employees, especially young workers and women workers, should be informed about the hazards of tritium.