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Exposé oral

**Written submission from the
Passamaquoddy Recognition
Group Inc.**

**Mémoire du
Passamaquoddy Recognition
Group Inc.**

**Regulatory Oversight Report for
Canadian Nuclear Power Generating
Sites in Canada: 2021**

**Rapport de surveillance
réglementaire des sites de centrales
nucléaires au Canada : 2021**

Commission Meeting

Réunion de la Commission

November 3, 2022

Le 3 novembre 2022

Submission by the Passamaquoddy Recognition Group Inc.

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**To the Canadian Nuclear Safety Commission
Regarding The 2021 Regulatory Oversight Report (ROR) for Nuclear Power
Generating Sites**

2022-09-16

Contents

Intervention	3
Passamaquoddy Recognition Group Inc. (PRGI)	3
Background	4
The Occupation of Point Lepreau	4
The Nuclear Conversation Backdrop	5
The ROR & CNSC Oversight.....	6
Beyond Acknowledgement	7
CNSC’s ‘Engineering’ of Health and Safety	9
List of PLNGS-related Oversights on the part of CNSC staff	10
Oversight #1: Failure to replace tritium-contaminated heavy water	10
Oversight #2. Size of Extended Planning Distance Zone for Emergency Measures.....	12
Oversight #3: Realistic Source Term in the event of a Severe Nuclear Accident.....	14
Oversight #4: The size of the overpressure relief valves	17
Oversight #5: The financial guarantee for decommissioning Point Lepreau	21
List of Notes Specific to Various Sections of the ROR.....	25
Conclusion.....	35

Our submission includes our interpretation of insights from various rights holders, including those of members of the Nation and Chief Hugh Akagi. We also share the expertise of interested parties who from time to time have been hired to advise and/or represent the Nation, including Dr. Gordon Edwards and Dr. Susan O’ Donnell, and Kim Reeder, MEM.

Intervention

This submission is filed by the Passamaquoddy Recognition Group Inc (PRGI, the “intervenor”) in response to the *Canadian Nuclear Safety Commission’s (“CNSC”)* request for comments on the *2021 Regulatory Oversight Report (ROR) for Nuclear Power Generating Sites (NPGS)* which provides an overview of regulatory efforts related to CNSC-licensed nuclear power plants and waste management facilities in Canada in 2021. A public meeting with respect to this matter is scheduled for November 3, 2022.

We appreciate the funding support, through the Participant Funding Program which enabled our participation.

Passamaquoddy Recognition Group Inc. (PRGI)

PRGI is a not-for-profit Indigenous-led organization representing the Peskotomuhkati Nation in Canada.¹ We represent the interests of rights holders and the Peskotomuhkatik ecosystem, which includes the Point Lepreau Nuclear Generating Station (PLNGS) and areas that may be affected by it. Our duty is to protect our lands, waters, and environment for all present and future generations.

Conservation is our sector, and thriving, protected indigenous ecosystems is our mission. We aim to explore our history, share our stories, and protect our past and future. We are honoured and committed to meet the challenges of tomorrow based in the teachings of yesterday.

¹ Peskotomuhkatihkuk spans the borders that were later created by the United States and Canada.

Our goal is to help re-establish the means to coexist with nature, eliminating the struggles caused by 20th and 21st century human pressures. Our strategies utilize modern best practices, alongside traditional methods.

We foster innovative practices, principled creativity, and proactive means to help ensure our traditional ecosystems can re-establish themselves into healthy, sustainable, and thriving wildernesses.

In our tradition, authority is always accompanied by responsibility, and rights are accompanied by obligations. If we have the right to fish, that right is not ours alone: it also belongs to future generations of our people. For them to have a meaningful right to fish, there must be fish for them to catch.

We have the responsibility to ensure that there will be healthy lands and waters for human and natural populations in the future.

Background

The Occupation of Point Lepreau

Since time immemorial, the Peskotomuhkati have lived and thrived on the shores of the bountiful Bay of Fundy, including the current site of the Point Lepreau Nuclear Generating Station (PLNGS). For generations, medicines, foods, and teachings coming from these lands and waters were available to our people until they were given the sole purpose of facilitating the PLNGS, and now, our homeland is also the unacceptably proposed location for two small modular nuclear reactor (SMNR) technologies.

The PLNGS exists within Peskotomuhkatihkuk. It is a mere 45 km from our sacred capital, and 47km and 90km respectively from our communities of Sipayik (Pleasant Point) and Motahkomikuk (Indian Township).

Consent was never sought, nor granted from our people, for the development of the Point Lepreau nuclear reactor facility on the shores of the Bay of Fundy.

Refurbishment of the station was completed in 2012 against our will.

Most recently, in opposition to our stated needs and offers to work together during a 3-year operating licence, (a period longer than NB Power's average licence length of 2.44 years) - Point Lepreau was instead granted a 10-year operating license by the CNSC. We believe, in part, the extended licence length was requested and authorized to enable an efficient co-siting of proposed SMNRs with PLNGS. Though we have been told time and time again that these projects and licences are separate, we have decades of experience with nuclear proponents and understand that the co-siting of these projects is essential to avoid the Government of Canada's Impact Assessment Act.

[The Nuclear Conversation Backdrop](#)

To preface our commentary regarding the ROR, let it be known that we struggle with the piecemeal approach utilized by nuclear proponents and government. Instead of participating in a holistic conversation about nuclear, including context, risk and consequence, we are asked to respond to specific indicators, projects and 'snapshots in time' and are discouraged to draw links between projects, either because of the project scope, and/or the limited mandate of the host of the conversation.

The ROR & CNSC Oversight

The ROR is a summary of the activities of the CNSC staff, in overseeing the behaviour of licensees.

‘Overseeing’ refers to supervising (a person or work), especially in an official capacity. However, it has another meaning, ‘a failure to notice or to do something’.

The following commentary, which includes both general and specific notes and observations, explores aspects of the ROR that seem to bypass, gloss over or totally neglect many of the real concerns of the Peskotomuhkati and numerous members of the public.

Even the best of technologies will sometimes fail. Even the most scrupulous care will sometimes prove inadequate. Even the best intentions will sometimes go astray. We cannot afford to take for granted the long-term health and safety of persons now and in the future, nor the long-term integrity of the land and waters, and the creatures living within.

In the following pages we identify a number of important issues we consider as oversights on the part of CNSC staff that should be brought to the attention of the Commissioners and carefully considered. The observations refer to ‘failure to notice or do something’ that do not explicitly violate any regulations, but which do have the potential to compromise safety in the grand scheme of things.

Many of these matters were brought up by intervenors during the recent May 2022 Hearings to renew the licence of the Point Lepreau NGS but have also been discussed and brought to the attention of CNSC staff and Commissioners in the past – it seems they have been, intentionally or unintentionally, ignored. We note however, that we have not received

the detailed description of decision regarding the most recent PLNGS relicensing, a decision that was made at least three months ago - perhaps the answers we seek will be elucidated in that document.

Beyond Acknowledgement

We will start our more specific commentary regarding the contents of the ROR - as did the ROR – with a comment about our lands. The Executive Summary of the ROR opens with the statement,

The Canadian Nuclear Safety Commission acknowledges that nuclear power generating stations are located on the traditional territories and homelands of many Indigenous peoples and are covered by several treaties.

Though this statement is true, it is also unfinished. **We recommend that the CNSC also acknowledges that the nuclear power plants (NPPs) were built, and hazardous nuclear waste continues to be produced and stored without the consent of Indigenous Nations** (at least in the case of PLNGS), which is not in alignment with Treaty relationships. Let's acknowledge the truth - the first step in the Government's commitment to *Truth and Reconciliation*.

Many Peskotomuhkati interests are recorded in the Peace and Friendship Treaties. The Nation did not surrender land or rights by way of the Peace and Friendship Treaties nor by any other means since. None of the Peskotomuhkati rights has been extinguished.

The Treaties respect access to the land; the Treaties recognize and respect the pre-existing and continuing reality of Indigenous existence in this part of the world, and our inherent connection with the land. **We desire to understand how Treaty commitments will be**

applied, and recommend the CNSC adjust its processes and oversight, as well as reporting, to align with their Treaty responsibilities.

We also highlight the words of CNSC Commissioner Kaghee during the PLNGS re-licencing hearings in May of 2022, he said, “...we often talk about engagement, consultation, but we miss the objective, and that's to reconcile.”²

Further, he brought attention to Section 35 of the Constitution, which, both recognizes and protects the rights of Indigenous peoples. He then described extensive caselaw setting out what is required to ensure the protection of these rights, including the requirement for consultation and accommodation, which is meant to promote reconciliation and serve as a strong check on Crown decision-making on matters impacting indigenous rights and interests.

Commissioner Kaghee also discussed that Canada has moved forward to pass the UN Declaration into law, and is now embarking on a process for implementation, which not only recognizes Indigenous peoples' right to self-determination, but also provides additional checks on Crown decision-making. He specifically referred to Articles 8, 18, 25, 26, and 29.

Finally, he pointed to the Truth and Reconciliation Commission's 10 principles for reconciliation, one of which is the reaffirmation of the treaty relationship, and the first principle, which states:

“The United Nations Declarations on the Rights of Indigenous Peoples is the framework for reconciliation at all levels and across all sectors of Canadian society.”

In light of all of this, his question in reference to the Point Lepreau re-licensing and now ours, in reference to the continued occupation of Point Lepreau by the PLNGS, is: **how will**

² <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Transcript-May10-Hearing-e.pdf>

supporting, and allowing PLNGS to continue operating without consent on our homeland, promote and facilitate reconciliation?

CNSC's 'Engineering' of Health and Safety

It is our perception that the ROR is intended to - and does, concentrate on the many regulatory targets and criteria that are laid down in CNSC RegDocs and the licensees' performance in satisfying them.

In doing so, the focus is necessarily on the hard sciences, pure and applied – physics, chemistry, engineering – without much attention to the biomedical or ecological sciences. However, in our view, this seems paradoxical, as the *raison d'être* of the CNSC, from a public perspective, is to protect the health and safety of Canadians (both workers and the public) as well as the environment - and both the biomedical and environmental sciences should have a great deal to do with satisfying these objectives.

We found that the 2021 ROR and most other CNSC documents, unfortunately lack context for those interested in understanding whether or not the health and safety of persons and the environment is indeed being protected from nuclear-related risk.

Information related to the reasons for the various CNSC regulations – the many harmful biological effects of chronic or acute exposures to radioactive materials, and the multitudinous pathways of radionuclides through the environment and through the body – the actual health threats and real environmental risks - go unmentioned.

The emphasis in the ROR is almost exclusively on the engineered systems – ensuring that these systems are monitored, maintained and tested to meet prescribed standards –

possibly in the belief that neither the health and safety of persons nor the integrity of the ecosystem has to be explicitly considered as long as the engineered systems work as planned.

Good engineering helps to prevent undesirable results. That is understood. If undesirable results could be totally and irrevocably prevented by engineering, or if they simply would never occur, then questions of adverse health effects and environmental degradation never need to be explicitly addressed. But the authentic and reasonable concerns of the Nation and much of the public arise when the engineered systems prove unequal to the task - either through inherent limitations, poor design, accidental failures, or negligence. What then?

[List of PLNGS-related Oversights on the part of CNSC staff](#)

Oversight #1: Failure to replace tritium-contaminated heavy water

It is a long-standing stated principle of the CNSC to keep all radioactive exposures “As Low as Reasonably Achievable” (the ALARA principle), yet during the refurbishment of the Lepreau reactor, NB Power was allowed to refill the calandria and the primary heat transport system with tritium-contaminated heavy water.

Since both worker exposures to tritium and environmental releases of tritium are directly related to the tritium inventory that has accumulated in the heavy water inventory over many years of operation, this oversight – this ‘failure to notice or do something’ – in this case, the obvious need to replace the contaminated heavy water with clean, uncontaminated heavy water – has guaranteed that the ALARA principle is routinely violated, both onsite and offsite.

Tritium emissions at Point Lepreau are almost double what they are at other CANDU Nuclear Generating Stations, and worker doses are higher as well: (2021 ROR p.27, reproduced

here for convenience.) From the following table, we calculate the collective doses per reactor during routine operations, Point Lepreau: 170 mSv; Darlington: 68 mSv; Bruce A: 96 mSv; Bruce B: 119 mSv and note that these types of calculations should already be included in the ROR.

Table 8: Breakdown of collective dose for operating NPPs in 2021 (person-mSv)

NPP	Number of Operating Units	Routine Operations	Outages **	Internal	External	Total
Pickering	6	987	2,915	862	3,040	3,902
Darlington	4*	273	13,135	448	12,960	13,408
Point Lepreau	1	170	117	66	221	287
Bruce A	4	384	8,038	297	8,125	8,422
Bruce B	4*	477	9,497	264	9,710	9,974

* During 2021, DNGS and Bruce B each had one (1) unit undergoing refurbishment activities

** For 2021, DNGS and Bruce B had dose attributed to refurbishment activities

During the 2022 hearings, NB Power said that it is planning to eventually replace the contaminated heavy water with uncontaminated material, but neither the CNSC staff nor the Commissioners insisted that it be done immediately or as soon as possible. Why not? In our view, this is an inexplicable oversight on the part of CNSC. Now, with a 10-year operating licence, NB Power is under no pressure to do the right thing.

Observations regarding Failure to replace tritium-contaminated heavy water

1.a> CNSC staff failed to alert the Commissioners or the public to the inevitable radiation exposure consequences of allowing NB Power to re-use tritium-contaminated heavy water in the refurbished Point Lepreau reactor.

1.b> Commissioners authorized a 10-year licence extension without requiring that the contaminated heavy water be replaced with 'clean' material.

1. c> These oversights on the part of the Commission and the staff are inconsistent with the ALARA principle and are perceived to be inconsistent with the mandate of the CNSC to protect the health and safety of Canadians, and the environment.

We recommend that the CNSC ensure that the PLNGS tritium-contaminated heavy water be replaced immediately.

Oversight #2. Size of Extended Planning Distance Zone for Emergency Measures

The ROR refers [on p.36] to the Point Lepreau Off-Site Emergency Plan (published by New Brunswick Department of Justice and Public Safety and New Brunswick Emergency Measures Organization, 30 June 2021). However, CNSC staff makes no mention of the fundamental error in this document based on a misreading of IAEA recommendations, drastically reducing the size of the Extended Planning Distance Zone, while excluding much of Peskotomuhkatihkuk.

In the Off-Site Emergency Plan, linked below,³ there is a 50-kilometre Extended Planning Distance Zone (EPT) indicated, allegedly based on IAEA recommendations (the NB document explicitly cites “IAEA Planning Zones”).

However, the IAEA recommends a 100-kilometre EPD zone for any reactor as large as PLNGS, or even a reactor half the size of PLNGS. Indeed, PLNGS generates over 2000 megawatts of heat. The 50-kilometre EPD zone is only appropriate, according to IAEA, for reactors of a size less than 1000 MW thermal.⁴

This simple mistake means that the Extended Planning Distance Zone on which the NB Emergency Measures Organization bases its contingency plans, is only one-quarter the area of the EPD zone recommended by IAEA. It currently excludes portions of Maine, as well as portions of Nova Scotia. Although arrangements in this planning zone will be “less detailed and have less specificity” (Off-Site Emergency Plan, p.17) than the other planning zones, it is important that all relevant information be shared with these other jurisdictions and that coordination in the event of an emergency is frictionless.

Observations regarding the Size of Extended Planning Distance Zone for Emergency Measures

2. a) CNSC staff failed to notice or to correct the error made in the NB Off-Site Emergency Measures plan affecting the size of the EPD zone in the event of a contingency impacting such an extended area, one that necessitates coordination with two jurisdictions outside of New Brunswick.

³ http://www.ccnr.org/Lepreau_Emergency_Plan_2022.pdf page 17

⁴ www.ccnr.org/draft_ds504.pdf page 177

2. b> CNSC Commissioners failed to take notice or to act to correct the size of the EPD Zone before granting a 10-year licence extension to PLNGS.

We recommend that the CNSC ensure the NB Off-Site Emergency Measures plan be corrected immediately to align the size of the PLNGS EPD zone with IAEA guidance.

Oversight #3: Realistic Source Term in the event of a Severe Nuclear Accident

The IAEA has recommended that for emergency planning purposes, the ‘source term’ (radioactive release) hypothesized by nuclear authorities in the event of a severe nuclear accident should include 10 percent of the volatile fission products that are contained in the core of the reactor at the time of the accident. In general, the most important volatile fission product is cesium-137 – given off as a metallic vapour, which turns solid on contact with any cool surface such as soil, clothing or skin.

The PLNGS reactor core contains at least 70,000 terabecquerels of volatile cesium-137, so one could assume (following the IAEA recommendation) that at least 7,000 terabecquerels of cesium-137 may escape into the environment in the event of a severe nuclear accident.⁵

What ‘source term’ should be used for Emergency Planning Purposes in the event of a severe nuclear accident at Point Lepreau? That is a very important question because emergency measures are based on the magnitude of the hazard. The greater the hazard, the more resources must be made available to cope with it. If the hazard is seriously underestimated, the

⁵ A terabecquerel is a million million becquerels, which is the same as a thousand billion becquerels. One becquerel indicates that one radioactive disintegration occurs every second.

response will be correspondingly under-resourced. Lack of resources means poor planning and inadequate response to emergency.

The only document we have found prepared by CNSC staff to address this question of ‘source term’ under such circumstances is the 2015 Report entitled “*Study of Consequences of a Severe Nuclear Accident and Effectiveness of Mitigation Measures.*”⁶ The ‘source term’ specified within, corresponds to a release of only 100 terabecquerels of cesium-137; that is less than one and a half percent of the IAEA guideline. Here is the excerpt from page 17:

“REGDOC-2.5.2 defines a large release as a release of radioactive cesium (Cs-137) greater than 1×10^{14} becquerels (Bq) over the duration of the accident. The underlying goal has been defined in terms of avoiding undue public disruption, in the case of the large release of Cs-137, to avoid long term relocation. It is a release of this magnitude that was examined in this study. The release of a greater magnitude is practically eliminated in light of the improvements emanating from the Fukushima Task Force.”

10 to the 14th power is a 1 with 14 zeros after it, or 100 with 12 zeros after it, which is 100 million million. A terabecquerel is a million million becquerels. The CNSC source term is therefore 100 terabecquerels of cesium-137. If the IAEA is right, then the actual radioactive release during a severe nuclear accident could be 70 times greater – 70 times more hazardous – than the CNSC staff is declaring. That is alarming, because it means first responders will not be

⁶ <http://www.nuclearsafety.gc.ca/eng/pdfs/health-studies/Severe-Nuclear-Accident-Study-eng.pdf>

properly equipped or prepared if they think the hazard will be 70 times less than actual. If you read the quoted paragraph carefully, you will observe that even the CNSC staff says a “large release” of radioactivity is anything *greater* than 100 terabecquerels of cesium-137 – so we believe the CNSC staff have clearly chosen an unrealistically low number for their hypothetical ‘source term’, even by their own definition.

Observations regarding a Realistic Source Term in the event of a Severe Nuclear Accident

3. a> CNSC staff has chosen an unrealistically low ‘source term’ in the event of a severe nuclear accident and has ‘failed to notice’ that this will inevitably put the NB Emergency Measures Organization – not to mention many of the inhabitants of New Brunswick, Maine, and Nova Scotia – at a tremendous disadvantage.

3. b> The Commission has either failed to notice CNSC staff’s unrealistically low ‘source term’ or has failed to act to obtain an independent peer review of this hypothetical release of cesium-137 after a severe nuclear accident.

Given the fact that many knowledgeable people have questioned the credibility of the CNSC staff’s choice of hypothetical source term, we recommend **President Velshi ask her colleagues at the US Nuclear Regulatory Agency and/or those at the International Atomic Agency to weigh in on the subject of Realistic Source Term in the event of a Severe Nuclear Accident, especially in light of the CNSC staff’s statement that “the release of a greater magnitude is practically eliminated in light of the improvements emanating from the Fukushima Task Force.”** It would be instructive to learn whether independent nuclear experts

from another agency would agree that 98.5 percent of all volatile cesium-137 will be successfully contained under all severe accident scenarios.

Oversight #4: The size of the overpressure relief valves

We recently learned (at the May 2022 PLNGS relicensing hearings) that a group of about six CNSC experts has been studying the adequacy of the overpressure relief valves at PLNGS and will be issuing a report on this issue. This information comes from the testimony of a subject matter expert, Dr. Nitheanandan, who was questioned about this matter by Commissioner Bérubé (Transcript, May 11, 2022, page 107.)⁷

NB Power was apparently unaware that this safety question was under renewed investigation by CNSC experts, as Mr. Derek Mullins of NB Power said just a few minutes earlier that this issue was definitively settled years ago through a CANDU Owners Group study. He stated,

“There are no safety issues with these degasser condenser relief valves. They were appropriately sized. They underwent testing at Wyle Labs as a part of a demonstration that they meet ASME testing requirements. That was all part of the design. There is no issue with these. Thank you.”

Even Dr. Viktorov of the CNSC staff did not seem to know that the issue was under renewed investigation. Following Derek Mullins, Dr. Viktorov said:

⁷ <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Transcript-May11-Hearing-e.pdf>

“Indeed, the issue of pressure relief valves is a longstanding question we received from one of the intervenors. It has been examined in great depth, both by staff, industry and independent experts. It has been confirmed again and again that the current valves are adequate and meet the requirements, so CNSC staff is convinced that there are no safety issues.”

Had it not been for Commissioner Bérubé’s persistence, we would not have heard at all from Dr. Nitheanandan, who testified as follows:

“As New Brunswick Power said, we have been looking at this for a number of years. There was a COG Report that we wrote, COG JP4534, in the year 2002 and according to that all these concerns were resolved, but lately, several papers were published in the international journals and then we started to look at those claims.

So we brought in about six of our experts and the author of the paper and then we have completed approximately four different meetings over a period of about six to seven months and we are very close to writing the report.

At the moment we don't see any safety concerns per se, but there [is] some credibility to some of the claims that needs extensive review. We are at that stage and we are writing the report and will produce a joint report between the author and the CNSC experts.”

Why is this important? Any prolonged overpressurization of the primary heat transport system is dangerous, because if the pressure is not relieved quickly enough, there will be a rupturing of the pipes. This constitutes a loss of coolant accident (LOCA).

In the context of a severe nuclear accident with fuel damage, a LOCA also provides a path by which volatile fission products can freely escape from the core of the reactor. If the LOCA occurs in one of the four nuclear boilers (also called steam generators) there will unfortunately, be a clear path to the outside environment by which unfiltered radioactive releases can occur with no way to stop them.

Therefore, depending on where the rupture occurs, the off-site releases of radioactivity in the event of core damage can be greatly increased. In the worst cases, the releases of volatile cesium-137 could be twice as great as the IAEA figure given in the previous section. If that were to happen, the off-site hazard could be 140 times greater than that proposed by CNSC staff in its 2015 *“Study of Consequences of a Severe Nuclear Accident and Effectiveness of Mitigation Measures.”*

As Dr. Nitheanandan testified, *“at the moment we don’t see any safety concerns per se, but there [is] some credibility to some of the claims that need extensive review.”* He is saying that we do not have a definitive answer yet.

Is it not an oversight that this information – the fact that a serious re-evaluation is underway – was not communicated beforehand to the Commissioners or to the licensee, given that NB Power was requesting a 25-year licence extension?

Observations regarding the size of the overpressure relief valves

4. a> Given the fact that the Commissioners are the decision makers, not the CNSC staff, it is in our opinion not just an oversight but seriously irresponsible not to fully inform the Commissioners of any relevant outstanding question that could have major safety implications under adverse circumstances, potentially turning a severe but manageable accident into a genuine catastrophe.

4.b> We feel the fact that the Commissioners chose to grant a 10-year licence to NB Power (longer than any licence previously granted) without requiring a resolution of this consequential safety issue is not just an unfortunate oversight but seriously undermines public confidence in the CNSC as a credible watchdog agency that 'will never compromise public safety'.

The issue of pressure relief valves has been in dispute for more than a decade and still remains unresolved, "requiring extensive review". This suggests the possibility that CANDU owners are deceiving themselves due to a strong disinclination to accept that there may be a generic safety-related design issue affecting all CANDUs. Under the circumstances, **we recommend President Velshi ask her colleagues at the US Nuclear Regulatory Agency and/or those at the International Atomic Agency to weigh in on the subject of the size of overpressure relief valves.** It is worth noting that all other power reactor designs that we are aware of have pressure relief valves that are one or two orders of magnitude (10 to 100 times) larger than those in the primary cooling system of the Point Lepreau nuclear reactor.

Oversight #5: The financial guarantee for decommissioning Point Lepreau

Our Nation has a right to expect that our homeland and traditional territory will not become the site of a radioactive waste dump, without providing explicit consent. According to Article 29 (2) of the UN Declaration on the Rights of Indigenous Peoples, the need for prior consent is quite clear:

UN Declaration 29(2): "States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent."

The Commissioners have a moral and legal responsibility to ensure that NB Power's Financial Guarantee for the decommissioning of the PLNGS reactor is adequate to ensure that all of the necessary work can be accomplished.

Without the Nation's consent to host a permanent or long-term radioactive waste repository on our lands, the decommissioning operation will have to involve not only dismantling the reactor but also packaging the radioactive and non-radioactive toxic wastes and transporting them to some off-site location yet to be determined.

There is no experience in decommissioning a full-scale CANDU reactor. It has never been done. However, the capital costs for constructing a CANDU are known to be greater than the costs of constructing a comparable light-water reactor (LWR), due in part to the larger size and much greater complexity of the CANDU core. The cost of dismantling a CANDU will likely be greater than the corresponding cost for an LWR, for the very same reasons.

Some hint of the decommissioning cost may be gleaned from refurbishment expenditures. Removing the pressure tubes, calandria tubes, feeder pipes, and (in Ontario) the steam generators, can be regarded as a kind of “mini-decommissioning” operation. But full decommissioning will involve much more – the calandria vessel, the end shields, the concrete vault, the pumps and headers. and then entire buildings.

The funds set aside for carrying out the complete decommissioning operation, as currently laid out in the Point Lepreau Preliminary Decommissioning Plan, are clearly inadequate, amounting to slightly more than a billion dollars (1.083b 2019 \$). This compares poorly with the experience-based estimates from the OECD Nuclear Energy Agency, as documented by the Passamaquoddy Recognition Group Inc. during the Point Lepreau relicencing hearing.⁸

The Point Lepreau Preliminary Decommissioning Plan (PDP) assigns only 5.6 percent of the total decommissioning budget to radioactive waste management, while the OECD NEA study assigns 28 percent of the total cost to radioactive waste. The reason for this discrepancy may be found in Table 6 of the Point Lepreau PDP (reproduced here for convenience), where all the radioactive wastes from dismantling the PLGNS are assumed to be Low Level Wastes.

⁸ www.ccnr.org/GE_Lepreau_PRCI_2022.pdf

This table, taken from the Point Lepreau PDP, indicates nothing but Low-Level Waste

TABLE 6
SUMMARY OF ANNUAL DECOMMISSIONING EXPENDITURES

COST CATEGORIES (Thousands, 2019 CAD Dollars)

Year	Labor	Equipment & Materials	Energy	LLRW Disposal	Other	Totals
2040	48,014	3,255	6,329	213	34,941	92,752
2041	34,661	3,902	6,086	338	25,684	70,673
2042	19,338	599	1,450	45	11,941	33,373
2043	19,338	599	1,450	45	11,941	33,373
2044	19,391	601	1,454	45	11,973	33,464
2045	19,338	599	1,450	45	11,941	33,373
2046	19,338	599	1,450	45	11,941	33,373
2047	9,555	470	499	27	6,950	17,501
2048	6,418	430	193	21	5,355	12,417
2049	6,401	429	193	21	5,340	12,383
2050	6,401	429	193	21	5,340	12,383
2051	6,401	429	193	21	5,340	12,383
2052	6,418	430	193	21	5,355	12,417
2053	6,401	429	193	21	5,340	12,383
2054	6,401	429	193	21	5,340	12,383
2055	6,401	429	193	21	5,340	12,383
2056	6,418	430	193	21	5,355	12,417
2057	6,401	429	193	21	5,340	12,383
2058	6,401	429	193	21	5,340	12,383
2059	6,401	429	193	21	5,340	12,383
2060	6,418	430	193	21	5,355	12,417
2061	6,401	429	193	21	5,340	12,383
2062	6,401	429	193	21	5,340	12,383
2063	6,401	429	193	21	5,340	12,383
2064	6,418	430	193	21	5,355	12,417
2065	6,401	429	193	21	5,340	12,383
2066	6,401	429	193	21	5,340	12,383
2067	6,398	429	195	38	5,347	12,406
2068	5,518	430	940	6,287	7,730	20,905
2069	5,590	433	941	6,253	7,702	20,919
2070	37,063	2,087	2,130	96	5,326	46,703
2071	42,098	20,936	2,060	12,890	15,916	93,901
2072	46,055	28,596	1,994	26,110	27,572	130,327
2073	28,755	9,136	1,640	14,778	8,379	62,688

2074	29,815	6,170	1,266	9,859	5,817	52,927
2075	23,197	6,999	308	38	2,557	33,100
2076	12,100	10,990	203	0	2,006	25,299
2077	298	270	5	0	49	622
Total	547,559	105,252	35,509	77,559	317,251	1,083,130

By ignoring the highly radioactive nature of all the intermediate level wastes originating from the core in the form of pressure tubes, calandria tubes, end shields, calandria, and more, a cost estimate is arrived at that is divorced from reality.

We highlight that during the May 2022 relicensing hearings Dr. Sandor Demeter also questioned the decidedly unrealistic assumptions on which NB Power bases the PDP costs (May 10, 2022 transcript - pages 139-151)⁹

Observations regarding the financial guarantee for decommissioning Point Lepreau

5.a> CNSC Commissioners have presumably accepted the financial guarantee proposed by NB Power for decommissioning the Point Lepreau reactor, by granting the plant a 10-year licence extension. **We recommend the 10-year operating licence be revisited if the CNSC, as an *agent of the crown*, is to satisfy its legal and moral responsibility to the Peskotomuhkati.**

⁹ Although this conversation focused on the DGR thus, high-level waste, and NOT the decommissioning waste – which was the point brought up by the PRGI, the principle of the conversation remains relevant <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Transcript-May10-Hearing-e.pdf>

List of Notes Specific to Various Sections of the ROR

Finally, we offer the following list of observations related to the specific content of the 2021 ROR. As we understand the 2021 ROR is not to be re-written, please interpret and apply the comments to future RORs, as is possible.

6.a> Executive Summary - The Executive Summary indicates, “CNSC staff concluded that the NPPs and WMFs operated safely in 2021” and lists supporting observations. **We recommend these observations are contextualized by stating how the observations trend, compared to the previous 10-year period.**

6.b> Section 1.2 - Scope of the Regulatory Oversight Report - The inclusion of ‘updated’ (2022) information is appreciated.

6.c> Section 1.3 - Nuclear facilities covered by this regulatory oversight report - The first paragraph ends with the statement, “All sites are located on traditional territories of Indigenous peoples in Canada.” **We recommend this statement is qualified by also stating whether the sites are willingly, or unwillingly hosted.**

6.d> Section 1.3.3 Waste Management Facilities - **Although we understand that PLNGS and Gentilly -2 are managed under different licenses, we recommend that in addition to inclusion in their specific NPP section, they can and should be added to this section in Table 2.**

6.e> Section 1.4 - Regulatory framework and oversight - **We recommend a number of paragraphs should be included regarding the CNSC's 'risk tolerance perspective' as well as a discussion of the methodology or rating scheme associated with the regulated facility and activity.**

6.f> Section 1.4.2 (page 118) - the Licencing section should indicate that NB Power requested a 25-year renewal period. It is mentioned earlier in the report, but **we recommend it should be stated again here, to give some context to the 10-year period granted.**

6.g> In section 1.4.4 Reporting - it states, "For WMFs, OPG is required to submit annual compliance reports as described in REGDOC-3.1.2, Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills. In addition, OPG is required to provide quarterly operations reports for all 3 WMFs as part of the conditions listed in the LCH."
We recommend a note as to whether is PLNGS under the same requirements, and whether or not this will be discussed in further in the PLNGS section.

6.h> Section 1.4.4 Compliance verification program – This section discusses 'additional reactive compliance verification activities' and 'unfavourable trends' **we recommend these should be summarized in this section or provided as an appendix.**

6. i> Section 2.1 Management System – In the 2nd paragraph it mentions that ‘CNSC will follow up,’ without stating an associated timeline. **We recommend qualifying/quantifying statements such as this, in future RORs.** The final paragraph of this section discusses minimum shift complement, but also does not qualify the statement by using the term ‘certified’, or the difference between certified and uncertified.

Finally, the statement seems disingenuous as we understand that there have been issues – and yes - both rightsholders and stakeholders want to know that steps were taken to cover minimum shift complement, which the report indeed covers, but we also want to understand – what is the depth of the problem?

6. j> Section 2.2 Human Performance - **We recommend that a sentence or two be included that discusses the methodologies or requirements which guide the NPPs in understanding how many actual certified positions they need to cover the required number.** For example, does the site require 50% more certified staff than required to ensure minimum shift complements? How does this compare across the NPP sites?

6. k> Section 2.3 Operating Performance - **We recommend summary information be shared about the root cause of transients over a 10-year period, as well as what categories exist relative to root cause.** For example – are most of the transients caused by a manufacturer defect of a component, age or non-maintenance of a component, computer systems malfunction?

This section also mentions, “The pressurized heavy water reactors (PHWR) individual target (which is the target for each of the 17 individual operational units) is 1.5 trips per 7,000 hours critical. All units in Canada met this target in 2021.” **We recommend a statement or chart be included regarding the 10-year trend in meeting the target** – for instance, in the past 10 years have all NPPs met this target – or are the 2021 results an improvement?

Directly beneath Figure 4, the paragraph states, “CNSC staff confirmed that forced outages and outage extensions were managed safely and in accordance with the applicable regulatory requirements. CNSC staff inform the Commission of unplanned outages resulting from reactor trips and their outcomes via status reports on NPPs, however none occurred in 2021.” We highlight that this paragraph needs to be reversed – it should start off with the sentence that no forced outages and outage extensions took place in 2021 – the way this paragraph currently reads feels disingenuous – you can not manage an incident safely, that did not occur. This is a perfect example of the issue brought to the Commissioners during the recent relicensing hearings in May 2022 in the Peskotomuhkati written intervention section called, “A Focus on Language and Trust’ beginning on page 74.¹⁰

Regarding operating within SOE limits in 2021, we recommend it would also be beneficial to see 10-year trends to understand whether these results represent an improvement or status quo.

¹⁰ <https://www.nuclearsafety.gc.ca/eng/the-commission/hearings/cmd/pdf/CMD22/CMD22-H2-244.pdf>

6.l> At the bottom of page 19, Section 2.4 – Safety Analysis - Candu Safety Issues (CSIs) are mentioned, where can these be found? Is there a list of which CSIs are evident at which NPPs?

We recommend a discussion of this question, be included.

At the top of page 20 – 2nd paragraph – the ongoing discussion between CNSC and the industry regarding using a “realistic analysis approach, in lieu of the traditional conservative approach,” **We recommend that these types of changes should likely be discussed, at the very least – conceptually with Indigenous Nations.** This is similar to the change indicated in section 3.7.2 regarding NBP’s intentions to apply the Multiple Choice Question (MCQ) methodology for its general certification examination.

6. m> Section 2.5 Physical Design – Fuel performance issues are mentioned in this section, as well as the adequate management of these issues – however, we are left with a lack of understanding regarding root causes and solutions. **We recommend this section should include a summary of incidents which also provides information regarding root causes and examples of fuel performance issues over a 10-year period, as well as what categories exist for classifying these types of incidents.**

6. n> Section 2.6 Fitness for Service – This section discusses the Special Safety Systems, but there again is a lack of context. **We recommend this section should include numerical data regarding the expected and measured unavailability of the special safety systems (and their description) in the current year and similar trend data for a preceding 10-year period, as well**

as a summary of incidents which also provides information regarding root causes and examples of unintended unavailability and categories which exist for classifying these types of incidents. For example – a test may be considered missed if the report was not filed on time, or the test was scheduled to be completed at a time when the plant was not running – and this test needs to take place during active operations. These are just examples, but likely there are more reasons that could be listed – and the CNSC should relay the ‘why’.

In the final paragraph under Figure 8, on page 22, the final sentence is, “While this is an operational issue rather than a safety issue, the Commission previously requested updates on improved fuelling machine reliability [RIB 17557 (item iii)].” This leaves us wondering whether the Commission did indeed receive updates, and if so, what they learned, **we recommend there is a discussion included regarding lessons learned and plans to incorporate those learnings.**

Regarding the discussion on page 23, again **we recommend it is of interest to have a summary providing information regarding root causes of the various backlogs and examples, long-term trend information as well as what categories exist for classifying these types of incidents.** For example – supply chain issues, manpower issues, etc. As well, an indication of the meaning of ‘critical components’ would be appreciated as in laymen’s terms anything labelled ‘critical’ should have zero backlog.

Further, below Table 7 (page 23), the discussion of elevated Heq and the associated CNSC conclusion of acceptable risk should be further contextualized. For example, by explaining the statistical risk of an incident based on elevated Heq over certain time periods. The document explains the mitigating actions, but not the severity or risk of the problem, for

instance, the final paragraph on this page discusses BNGS A and B but does not refer to other NPPs, therefore, without further contextual knowledge of the issue, readers are left wondering about the other NPPs – **we recommend further context is included.**

6. o> Section 2.7, Radiation Protection – (page 27 - second paragraph) it is noted that PLNGS is an outlier, but does not provide a statement regarding why, and if this is viewed as positive or negative from a CNSC standpoint - **we recommend further context is included.**

6. p> Section 2.9 Environmental Protection (page 34, 2nd to last paragraph) - a description of the table is provided, and discusses that, “...data for the DWMF, PWMF and WWMF is included in that of the DNGS, PNGS and BNGS sites, respectively.” However, no mention is made of PLNGSs’ waste facility - **we recommend a note on PLNGS is included.**

Additionally, in Table 9 figures are provided however, shouldn’t these be indicated per MWe or MWth capacity of the site? For example, the Bruce site has 8 reactors, all bigger than Lepreau. So why is the estimated dose for each of these sites so close? If measured by MW capacity of the site, would the results be different? **We recommend that future reports feature charts that include these figures per MWe at each site. On the same topic, a review of all tables and charts in the ROR is recommended to verify whether they meet the communication objectives.**

6. q> Section 2.10 (top of page 36) states that, “NBEMO continue to work on addressing findings from the 2019 Emergency Preparedness Review (EPREV) mission, in preparation for the

follow-up mission in 2023.” However, it does not link to the report, or provide information on who conducts these ‘missions’. **We recommend a note on this is included.**

In discussing the Synergy challenge, the following commentary was included, “...This exercise tested and validated emergency preparedness, response capabilities and the collaborative and consultation processes of NB Power and its stakeholders. Overall, the exercise was successful and met objectives.” However, there is no description of lessons learned or how they will be integrated in the future, until section 3.7.10. **We recommend a note is included discussing in which section of the report further information can be found.**

Section 3.7.10 also indicates, in reference to, “a Fire Response Type II inspection” and that NBP was expected to respond by March 24, 2022, but an update to June 1, 2022, was not included (as inferred it may be in section 1.2 Scope of the regulatory oversight report). **We recommend a note is included regarding why an update was not included.**

6. r> Section 2.11 Waste Management - In the final paragraph on the page (36), the report states, “For the nuclear facilities listed in this report there are no changes to note regarding the preliminary decommissioning plans (PDPs) for 2021. As this document is reporting on historical events, this statement is expected and accurate. However, we indicate (as we did during the 2022 re-licensing hearing for PLNGS in May of 2022)^{11,12} and above – that we expect and will work with NBP and CNSC to ensure changes are made to the PLNGS PDP to ensure realistic planning for the financial guarantee based on international evidence, as well as holding

¹¹ <https://www.nuclearsafety.gc.ca/eng/the-commission/hearings/cmd/pdf/CMD22/CMD22-H2-244.pdf>

¹² <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Transcript-May10-Hearing-e.pdf>

discussions regarding planning for decommissioning waste. (We also note that Financial Guarantees are mentioned in the ROR 2021 section 2.1.5 Other Matters of Regulatory Interest, pg. 41).

As learned during the relicensing hearing for PLNGS in May of 2022, it may be the CNSC PDP regulatory requirements that are not up to par, compared to our desires for the planning (please refer to Dr. Sandor Demeter’s comments and questions on pages 139-151 of the May 10, 2022, transcript).¹³ **We recommend this issue is taken seriously, and action is undertaken by the CNSC immediately.**

6. s> In Section 2.13 Safeguards and Non-Proliferation, at the final sentence of page 38, we learn that the, “...IAEA considered most of the inspection results to be satisfactory” however what we do not learn is where improvements are needed, based on the observations of the IAEA – **we recommend further context is included.**

Further, at the end of this section we learn about ongoing discussions with the IAEA regarding a ‘revised equipment-based approach for the verification of spent fuel transfers,’ but there is no context provided regarding the issue – **we recommend further context is included.**

6. t> Section 2.16 Indigenous Engagement - We note that the report indicates, “CNSC staff efforts in 2021 supported the CNSC’s ongoing commitment to meeting its consultation obligations and building relationships with Indigenous peoples with interests in Canada’s nuclear power generating sites. CNSC staff continued to work with Indigenous Nations,

¹³ <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Transcript-May10-Hearing-e.pdf>

communities, and representative organizations to identify opportunities for formalized and regular engagement throughout the lifecycle of these facilities, including meetings and workshops, aiming to discuss and address topics of interest and concern to interested Indigenous Nations and communities.”

In response, we recommend a workshop is developed and offered in 2022 with CNSC and/or independent legal experts who can describe to us how the CNSC justifies their recent decisions about licensing PLNGS for a 10-year period in light of our Treaty relationship, Section 35 of the Constitution, caselaw, the UN Declaration, and commitments/directives made by the Government of Canada.

We also take another chance to indicate that to date we have still not received the detailed record of decision regarding the 2022 PLNGS relicensing decision.

On a positive note, we very much appreciate that the CNSC has provided interested communities, such as ourselves, with notices of the opportunity for funding through the CNSC’s Participant Funding Program, as well as funding, to review and comment on this report and the opportunity to submit a written intervention and/or appear before the Commission as part of the Commission Meeting.

6. u> Section 3.7.3, **we recommend the outages section should in future list the outages, indicate which ones were planned and which were unplanned and the number of days/hours for each (as well as for the planned outages – what the planned times and budgets were, compared to actual), and root causes, with comparisons to the long-term trends.** As we know, the poor performance of the plant is of significant interest to the public in terms of making

decisions on alternatives to nuclear power generation to provide a reliable source of electricity for ratepayers.

Conclusion

We reiterate our conclusion from our May 2022 PLNGS written intervention.¹⁴

Sometimes the paths ahead of us seem predetermined. The pressures and expectations that surround us, the positions that we've taken up and the performances that others expect of us, all these things add up to a constricted space difficult to speak about, much less maneuver in. It can be hard to bear, and it can be hard to believe in the finding of new paths. But it is far from impossible.

Hear us when we say: the coalition of the future is much larger than our present day divisions would have us believe. In reality, we are everyday much closer together and more dependent on one another than we were the day before. Smaller issues fade as interdependence becomes the rule, not the exception (as it has always been for us). The challenges of our world are forcing us into a cooperation that, while we did not choose it, we increasingly realize we are made for: cooperation is our essence as people.

Those with monetary resources and those with social resources are coming together to change the world's most prevalent systems, which were never outfitted for ecological long life in the first place.

¹⁴ <https://www.nuclearsafety.gc.ca/eng/the-commission/hearings/cmd/pdf/CMD22/CMD22-H2-244.pdf>

In 5 years, the dialogue about energy management will be unrecognizable, as the aspirations of builders, thinkers, doers, and healers come together to insist on a new possible future: we must slow down and come into good relation with one another and with the earth.

We, the Peskotomuhkati, submit this intervention, requesting the Commissioner's consideration and fulfillment of our recommendations.

Further, we request that an authentic collaboration begin today, one that allows us to move through all that has come before and to together define and actualize, our common future. It is here now.