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**Written submission from Gordon W. Dalzell**

**Mémoire de Gordon W. Dalzell**

**Regulatory Oversight Report for Canadian Nuclear Power Generating Sites in Canada: 2019 and Update on OPG's Refurbishment Project at the Darlington Nuclear Generating Station**

**Rapport de surveillance réglementaire des sites de centrales nucléaires au Canada : 2019 et mise à jour du projet de réfection d'OPG pour la centrale nucléaire de Darlington**

Commission Meeting

Réunion de la Commission

**December 9, 2020**

**Le 9 décembre 2020**

Canada

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November 16, 2020

Canadian Nuclear Safety Commission
P.O. 1046, Station B
280 Slater Street
Ottawa, Ontario, K1P 5S9
Canada

To Whom It May Concern:

**SUBJECT:** Regulatory Oversight Report for Canadian Nuclear Power Generating Sites 2019.

As a community member and an environmental public interested individual , enclosed please find my comments and review on the Regulatory Oversight Report for Canadian Nuclear Power Generating Sites 2019.

Additionally, I have participated in the public review of the 2017 & 2018 Oversight Report of Nuclear Facilities in Canada. Thank you for taking my comments under review.

**Reference:**

- CNA submission public hearing May 29, 2018: https://www.cnsc-ccsn.gc.ca/eng/the-commission/hearings/cmd/pdf/cmd18-h6/CMD18-H6-43A.pdf
- TJ News – times globe : https://tj.news/story/101398426 (article attached)
- CNSC COVID-19 information: https://nuclearsafety.gc.ca/eng/resources/emergency-management-and-safety/pandemic-preparedness.cfm
- ACAP report – climate change and sea rise http://www.acapsj.org/climate-change-and-the-saint-john-harbour
- Standards and Guidelines for Tritium in Drinking Water https://nuclearsafety.gc.ca/eng/resources/health/tritium/standards-and-guidelines-for-tritium-in-drinking-water.cfm

Respectfully submitted,

Gordon W. Dalzell, BA, BSW

During the preparation of this submission, this writer was distressed to read the headlines in the Saint John, NB local Time Globe newspaper of November 4, 2020 titled “Radioactive emissions on the rise at Point Lepreau.”

These increases continue to raise eight years after its returned online following refurbishment as noted in data released from the CNSC. Although, reassured by NB Power, these releases are small fractions of a percent compared to regulatory limits.

In reviewing the oversight report for 2019, on the Point Lepreau site, Section 3.7.9 on page 149, this writer read the following statement:
*“CNSC staff concluded that CNSC staff observed that all airborne and waterborne radiological releases from Point Lepreau remained below the regulatory limits and environmental action levels.”*

This writer has always had confidence in the CNSC regulatory oversight mandate to ensure the public is in the area near this facility is kept safe from any radiological releases. It is for that reason this writer was surprised and taken back by the commentary of a UK expert on radioactivity in the environment who reviewed the commission PLNGS data that “even at. 0.1 percent of the public dosage limit, the emissions is too high.” What is going on here? This raises the question whether the CNSC regulatory limit is adequate enough to protect the health of people living in the area of this and the other Canadian nuclear facilities.

The question for this writer and hopefully for the Commission members and CNSC staff is whether these CNSC limit/standards are adequate for tritium found in local drinking water around Point Lepreau. This ranges from 0.1 to 0.25 percent of the acceptable limit. This regulatory limit excepted by the CNSC has been questioned by Dr. Ian Fairlie, a subject matter expert (see attached article) as well as by the Ontario Drinking Water Association in 2009 government report that this regulatory limit is too high and should be drastically reduced.

If that recommendation was enacted, some levels around Point Lepreau would be near the maximum limit. I would like to see the Commissioners question the CNSC staff during your December 8,9 & 10, 2020 public meeting about this recently public newspaper story attached.

Why hasn't the CNSC adopted this more stringent standard for radiological releases? This writer is recommending that this recently reported issue of concerns be added to the upcoming agenda for December 8, 9 & 10, 2020 meeting.

This issue is of high public interest especially around the area of health impacts. The claims made by Dr. Ian Fairlie, the responses from NB Power and the CNSC spokesperson are not going to be sufficient to fuel public worry over the fact radioactive emissions from Point Lepreau nuclear generating station continue to rise eight years after it returned online following refurbishment.

The assurances offered by the licensee and CNSC that those emissions do not pose any health threat based on the current standards used is called into question by the subject matter expert Dr. Ian Fairlie, noting the CNSC has considered changing the standard in the 2012 discussion paper raising the idea of tightening standards by 20 times for existing nuclear facilities. The CNSC needs to revisit this issue of whether the currently used standards are adequate to protect human health and environment. The results of this review needs to be made public.

Why were these more stringent standards not adopted? As Canada is about to adopt an action plan on new small modular reactors associated with existing nuclear power plants, there is renewed public interest and debate on the role of the nuclear energy and eth need for it for electricity production.

The issues raised in this public media story are so important it’s imperative for the commission to finally review those current standards used to ensure they are adequate to protect human health.

I am recommending a formal review with public input and a hearing be initiated to review the technical science on which the current standards are based and whether new, more stringent standards are required.

Specific Comments on Section 3.7 - Point Lepreau Nuclear Generating Station
This writer has carefully reviewed this 2019 Oversight Report as well as the 2018 & 2017 reports and made formal submissions that are on the public record.

## SECTION 3.7 POINT LEPREAU NUCLEAR GENERATING STATION

This writer notes that PLNGS license was for a five-year period compared to other facilities which were approved for 10-year licensees. There is no explanation offered in this report on the Why?

Without an explanation from the CNSC, the public is left wondering whether these are some outstanding unresolved issues that need more formal reviews that are typically found in formal licensing hearings.

An explanation is required to reassure the public that there is no reason to be concerned. This is particularly important in light of the recently reported public media story that radioactive emission is on the rise at the Point Lepreau Nuclear Generating Station.

Is the CNSC aware of issues the public are not aware of for the need to give this licensee a shorter licence period - Five years versus 10 years? If so, the public needs to know what these reasons for granting PLNGS a shorter licence are, compared to other licensees.

**Fisheries Act Authorization**

One of the many advantages to publishing this oversight report by the Canadian Nuclear Safety Commission is to provide the public with updated information on various regulatory obligations and understandings under other Federal legislative mandates.

One such an important update was the Fisheries Act Authorization. Under that legislation, NB Power submitted for CNSC staff to review a preliminary self-assessment of serious harm to fish from cooling water intake.

It does not appear that all the information and the required steps were in this report as to why it is taking so long for this application. I consulted with NB Power and they did provide additional information in regards to the steps required to submit such an application. This is not included in the Oversight Report

To say the least, this has been a protracted process, "a back-and-forth process between NB Power, CNSC and Department of Fisheries and Oceans. This Fisheries Act Authorization has been going on since January 2017 when NB Power submitted a revised fisheries act self-assessment to the CNSC. It was formally agreed that Fisheries and Oceans Canada would take the lead as the primary regulatory agency. NB Power submitted a revised FAA application to DFO in 2019.

In August 2019, DFO deemed the Fisheries Act authorization to be complete; however, the 90-day time limit within a decision with respect to the application has ceased due to indigenous consultation requirements.

Such an important consultation should have happened in a timely manner considering how important this authorization is and the previous protracted time periods to obtain a decision.

An explanation on why this application had to be ceased needs to be provided to the CNSC Commission members at the December 2020 public meeting.

**Periodic Safety Review – Page 138**

There is reference to Periodic Safety Review (PSR). There is no reference in this section as to what are these specific safety factors. They should have been listed. They are only referred to as #1, 2, 3, 8, 10 and 15 – all submitted to CNSC in March 2019. The other ones 4, 5, 6, 7, 9, 11, 12, 13 & 14 in December 2018.

This Oversight Report states that CNSC staff completed the review of all 15 Safety Factor Reports in October 2019. What are these safety factors?

The update states that NB Power submitted the global assessment report in February 2020 which was under review by CNSC staff as of June 1, 2020.

The Commission members at their upcoming general meeting may want to consider making these available to the public and need to ask for a current update on this global assessment report to enable the public to be informed if there are any safety issues we need to be made aware of and if any – what are the steps that are being taken to correct them.

On page 140 of this Oversight Report, this writer was pleased to read of the explanation as to why some "fully satisfactory" rating were not assigned due to the lack of opportunity due to COVID-19 pandemic. – for staff to assure the consistent application of criteria for "fully satisfactory" rating across all Safety and Control Areas (SCA).
This writer questions whether this change to ratings was justified. Please refer to my comments on this issue under the section of Bruce A & B. The bottom line that was good to read "it does not reflect in " itself a decline in safety at Point Lepreau" is reassuring.

Further, the statement "CNSC did identify various examples of excellent safety performance, and instances of meeting and or exceeding regulatory requirements in 2019". At least these were acknowledged.

Even with these reassuring statements, this writer is not alone wondering how and if this pandemic has impacted all of these nuclear generating facilities in respect to these facilities being able to meet their regulated safety obligations outlined in this Oversight Report.

This writer is recommending a separate dedicated report be prepared for the general meeting with an update report to the post on the CNSC website to keep the public fully abreast of any limitations, problems or increases in non-compliance areas. This entire area of concern is even more relevant considering the second wave of COVID-19 especially in Ontario where there is such a large presence of nuclear generations and nuclear waste storage facilities.

I am sure there are contingency plans to ensure none of these sites are compromised in terms of safety; however the public are not aware of them. Again at the upcoming hearing, the CNSC need to provide a dedicated updated report to the Commission for public transparency.

This is a relevant request since the Oversight Report identifies COVID 19 as affecting the ability to assign only “satisfactory” safety ratings.

This writer noted in reviewing the Oversight Report that there were too many non-compliances in various sections of 3.7.1 including Management System Organization, change management, record management, and personnel training.

The report notes many of these were either minor – low safety significance or negligible safety significance but the number of them raises questions on whether there has been some deterioration of internal oversight in the day to day operation of the facility. This non-compliance noted in the chapter on PLNGS give the perception to the public that oversight is slipping at this facility.

This appears to be a change from the 2018 Oversight Report that tracks these compliance areas.

## SECTION 3.7.4 SAFETY ANALYSIS

Despite these non compliances noted by CNSC staff, NB Power met the applicable regulatory requirements and its performance met CNSC staff expectations for the **SCA** safety analysis at Point Lepreau in 2019.

At the end of the day, despite those non compliances noted in this report, this above quoted statement on page 144 is what the public needs to be made aware of. This writer has absolute full confidence that PLNGS is operated safely. I have additional confidence in CNSC that if there are any issues regarding safety, they will be addressed.

**Probabilistic Safety Assessment**

The coverage of this Section 3.7.4 on Page 144 is woefully inadequate in a regulatory report for public consumption and undertanding. There is no explanation provided as to what kind of events or circumstances that make up a probabilistic safety assessment.

This section is poorly handled. More information on what is being assessed is required. This writer was permitted to see a summary list during a regulatory hearing about 10 years ago after being asked to sign a 24-hour confidentiality agreement to review the report so as to be able to be aware of it as a formal intervenor during that past regulatory hearing.

The millions of people who live in the vicinity of these nuclear power plants need to know what kind of safety assessment is this and more importantly what are the safety risk factors identified and how such risks are managed and mitigated (apart from the security ones) which would be of course outside the public domain.

Providing fifty four words in three sentences on such an important area related to potential safety issues fall far below public expectations considering the public around these sites could be adversely impacted. Why such limited information in Section 3.7.4?

**System Design**

One of many valuable oversight activities of CNSC is the inspection area. In this section of the report, it was noted that in 2018, CNSC had conducted an inspection of the electrical power systems that identified some non-compliances in the cable aging management program.

CNSC found that NB Power's detailed corrective action plan to establish a Cable Aging Management Program was acceptable.

The question is why wasn't such a program established prior to this period? The good news with this issue in so many words, is that once the problem was identified, corrective action plans were actioned to correct those outstanding issues in 2019.

NB Power took required action and "CNSC staff were satisfied with the progress made in 2019 and expected that the remaining documentation – related items would be addressed in 2020."

Despite the above actions the last paragraph on page 145 under the same heading, system design, raised another issue related to a secondary cable where CNSC staff noted that an electrical fault on a secondary cable of the station service transformer was due to a degraded splice and termination and subsequent failure of the cable. NB Power submitted an apparent cause evaluation report that identified a lack of an effective cable management program as a contributing cause.

There appears to be a disconnect between the last two paragraphs on page 145 in respect to cable aging management program. The first paragraph states the licence has such a program while line 4, second paragraph indicates a lack of an effective cable aging management program as a contributing cause of that electrical fault on the secondary cable of the station service transformer.

Considering the age of these nuclear facilities in Canada, having effective cables aging management programs is critically important. It seems somewhat unclear in respect to cable aging management program.

Question is how many other nuclear facilities have this issue re: effectiveness of their cables aging management programs. No doubt they all have such programs. My question is how effective are they?

All these older facilities have aging cables and this writer is reassured that CNSC is on top of this issue. Just another example of how effective the regulator is in examining all the regulatory requirement for this and the other Canadian Nuclear Generating facilities.

## SECTION 3.7.6 FITNESS FOR SERVICE

In the interest of more transparency, CNSC needs to be more specific with an explanation of what is meant by "NB Power met CNSC Staff's expectations for SCA Fitness for service at Point Lepreau in 2019.

The line *"There was no significant impact on nuclear safety as a result of these instances of unavailability*." This writer would have preferred to read "There was no impact on nuclear safety . This means there was some degree of impact but it just was not significant.
More explanation is required. What is the CNSC definition of "significant"?

**Aging Management – Page 147**

This part of the report under this heading reinforces this writers concern over how well the aging management program at Point Lepreau is being monitored and executed.
Evidence of such a concern is found in the sentence "In 2019, NB Power provided five submissions to address the non-compliances."

The other sentence “In 2018, CNSC staff had inspected the aging management program at Point Lepreau.” Non compliances included, discrepancies in the aging management process implementation compared to the governance documents.

This program needs much more attention and oversight at the facility level. Thankfully, CNSC is on top of this area along with all the other regulatory requirements for this and all the other nuclear generating facilities. This is why this community member maintains a high level of confidence with the CNSC.

## 3.7.7 RADIATION PROTECTION

By contrast to the Pickering site, Point Lepreau performance met and exceeded all applicable regulatory requirements in this application of ALARA (As Low As Reasonably Achievable) specific area.

## 3.7.9 ENVIRONMENTAL PROTECTION

As noted in the first part of my submission, it was distressing to pick up the morning paper of November 4, 2020, with the headline “Radioactive Emissions on the rise at Point Lepreau”. Even more worrisome was to have a subject matter expert Dr Ian Fairlie, former Head of UK government committee on internal radiation leaks, question whether the standards used by the CNSC are health protective, is a great concern.

This information which referred to the increases on the rise over the last eight years originates from CNSC data. In reading Section 3.7.9 Environmental Protection, there is no mention of such increases from PLNGS. I was reassured to read the first sentence of Section 3.7.9, *“CNSC staff concluded that CNSC staff observed that all airborne and waterborne radiological releases from Point Lepreau remains below the regulatory limits and environmental action levels.”* As noted in the first part of my submission, the CNSC needs to reassess whether the standards used, need to be reviewed.

Re: **Appendix D4** – Page 197, 198 Table 1, 14 & 15 : releases to atmosphere and water of such releases have been on the rise over the last eight years, it is difficult for the average community member to conclude there have been such increases.

Such increases Part 4, in Section 3.7.9, refers to "an increase from the estimated combined dose of 0.72 μSv in 2018." No indication there has been a steady increase over the last eight years. We shouldn't have to learn about such steady yearly increases in the morning paper. This kind of information should have been already stated in the narrative format, not a technical graph.

That information re: trends should have been clearly stated in Section 3.7.9 as well as Appendix D. Why wasn't just trend data not found in Section 3.7.9 re PLNGS? I would like to recognize that the licensee reached out to me about the article and provide me with some context as they know that I would be interested in this topic. That outreach was appreciated.

Please refer to my comments above re: whether CNSC accepted standards are health protective. Hopefully this issue will be given full attention by CNSC staff, the licensee and the commissioners themselves during their comments and questions to CNSC officials at the up-coming December meeting.

Further comments on Section 3.7.9 – top of pate 150
This licensee PLNGS submitted a revised risk assessment (ERA). CNSC had to recommend that future revisions to the ERA include an assessment of the magnitude and extent of the thermal plume from discharged cooling water and a broad risk assessment for the inter-tidal and new surface zones that could be affected by the thermal plume.

This environmental impact issue has been raised in the past – why didn't the environmental risk assessment cover this area of concern well before this? If it did, please summarize findings.

Now that PLNGS was expected to submit a revised ERA in June2020, that includes an updated thermal risk assessment, the upcoming meeting of CNSC in December 2020 should include an update on findings of this thermal risk assessment.

This writer is concerned over the delays and length of time to receive the finding of this thermal risk assessment. There may be very valid reasons for why it is taking so long and if so, a full explanation should be registered by the licensee and CNSC at the upcoming meeting.

## SECTION 2.1.5 OTHER MATTERS OF REGULATORY INTEREST

Based on past practice, this writer would prefer to see this section at the end of each chapter for the individual nuclear facilities as it incorporates this important information within each specific chapter of this report into each licensee.

## SECTION 1.4.6 UPDATE ON CNSC COVID-19 RESPONSE and NPP OVERSIGHT

Although completely understandable, I was concerned to read "CNSC Management immediately suspended all regular NPP compliance activities and identified activities that were considered critical in order to support continued safe power reactor operation and regulatory decision making in relations." In the public interest, I would like to see an update at the December 2020 meeting, so the public won't have to wait until next year to see if such a decision compromised or increased safety risks to these nuclear sites.

COVID-19 is a pandemic of unparelled portopotions and impact acround the world and Canada as well. All aspects of society have been turned upside down. One of the most worrisom concerns is the impact on the operational and regulatory implicaitons on the safe operations of these nuclear power generating facilities in particular the ones in Ontario.

This concern is even more acute now that Ontrario (GTA) is in the midst of a second wave, only expected to worsen over the next several months. Despite best preventative public health efforts, staff members especially those in critical certified positions, would be subjected to the COVID-19 itself or face a 14-day period of self isolation thus taking them out of commission. Same for CNSC staff being unable to carry out their inspection duties. This writer was looking for, and did locate, in the Oversight Report, information on this topic of COVID-19 and how the CNSC and licensees managed throught this pandemic.

An update was provided in this report as one would expect to find. In light of this pandemic and its impact on staff members, this writer recommends that a separate presentation with the latest updated information on this second wave be given by the licensees and CNSC at the hearing . This will be helpful for the public who may not have read this report but preferred to watch/listen at home on their various social platforms, such as this webcam.

A special public service media release or update could be developed for the public under their public information or engagement strategy. As noted in the report the public should not have to wait until the 2020 regulatory report to get a complete analysis on the pandemic impact on these nuclear facilities.

## SECTION 2 – GENERAL AND SUPPORTING INFORMATION

**TABLE 3, Page 25 – under Personnel Certification**

Most of the Nuclear Power Plants have a higher number of available certification for NPP compared to the certified positions for 2019. One exception that is noted by this writer is Point Lepreau under reactor operator – nine actual positions with six being the minimum available. That is pretty thin coverage considering if several workers got very sick, it could easily slip below the minimum requirement for these critically important certified positions.

Other NPPs had much more availability of certified reactor operators such as Darlington with 64 actual with 30 minimum. Without certified reactor operators, these plants could not be operated safely.

What steps are being taken to get more certified reactor operators available at PLNGS? This is even more relevant with a pandemic getting worse in Canada. The Commissioners need to examine this more thoroughly.

This writer would have liked to have seen some actions identified to increase the number of certification status and staff for reactor operator's positions.

Managing alcohol and drug use with such an important Management issue, this writer notes that OPG, Bruce Power and NB Power requested a change in their implementation dates for this regulatory change. No reasons are provided. In this writer's view, it appears that these licensees are stalling for time without any explanation provided and CNSC should not tolerate any further delays. Full explanations need to be provided if implementation dates are delayed.

**Severe Accident Analysis**

Good to see the CNSC requirements under severe accident analysis. Question is, what is included in such analysis and how well are these facilities doing in carrying out such analysis. There is no qualitative conclusion given in this section other than for NB Power's methodology for MAAP5-CANDU simulations was acceptable to CNSC staff. This is not the same as a report and based on the effectiveness, if heaven forbid, there was even a severe accident at any of these Canadian facilities. There are many unanswered questions in the mind of the public regarding severe accident analysis and more information should be provided.

**Aging Management**

In this writer's view, the topic of aging management related to pressure tubes and fuel channels is of critical importance from a day-to-day operational perspective, especially for those nuclear facilities that will be entering periods of extended operation beyond their effective full time hours (EFPH).

With a nuclear plant, any time they will be operated beyond their expected time frame, great care and attention needs to be focused on any aging impacts of these pressure tubes and fuel channels. This is why this writer was reassured to read in this report that CNSC have enhanced regulatory oversight and increased focus for licensees' activities to assess and manage the aging fuel channels for those facilities.

This is just another reason the public needs to have confidence in the oversight role of the CNSC with the operation of these nuclear power generating stations. Thank goodness CNSC is so effective in its oversight responsibilities.

This writer, after carefully reviewing these Oversight Reports for 2019, 2018 and 2017, continues to have a high degree of confidence in the expertise and thoroughness of the Canadian Nuclear Safety Commission as it carries out its regulatory responsibilities.

This is important to recognize effective regulatory work of the CNSC as there has been renewed interest in nuclear energy generation with both the refurbishment in Ontario and the development with small modular reactors (SMR) in New Brunswick. From this writers past involvement as an intervenor with CNSC, this writer believes that these SMRs would never be approved unless safe.

## SECTION 2.9 ENVIRONEMENTAL PROTECTON EFFLUENT AND EMISSION CONTROL (RELEASES)

Up until reading that newspaper article cited at the beginning of my submission, I had always been reassured that the standard used for regulatory dose limit for the public of 1 mSv per year was stringent enough. Further to the statement “hence no radiological releases to the environment from the facilities exceeded regulatory limits.”

Now I am beginning to have doubts on the above publically perceived subject matter expert reference cited at the beginning of my submission. The public needs to be reassured that the current standard is indeed health protective protectors.

Therefore, as noted above, the CNSC needs to evaluate this recently published newspaper claim and determine whether it is staff stands by the currently accepted standards or reassess and review whether a newer one is required.
APPENDIX D titled “Derived Release Limits and Radiological releases to the environment” : The standard adopted is CSA Standard N288 1-14. Does the Canadian Standard Association plan any review or updates?

The recent story cannot go by unchallenged by CNSC - the Federal nuclear safety regulator.

## SECTION 2.1.0 EMERGENCY MANAGEMENT AND FIRE PROTECTION/NUCLEAR EMERGENCY PREPAREDNESS RESPONSE

This is an area this writer has been following over the past several years of reviewing these CNSC Oversight Reports. Over the past several years ago PLNGS has been the leader in developing emergency management and fire protect within the 20 km zone area of the facility.

Point Lepreau Nuclear Generating Station has had a long and effective history working with the local fire authorities as well as the New Brunswick Emergency Measures Organization (NBEMO).

In fact, this writer in my commentary for the 2018 Oversight Report had used the Point Lepreau efforts and programs as an example for other licensees to follow.

In fact one of the highlights of their efforts was their public information and disclosure program for people living within and beyond the planning zones. One area of need this writer identified last year was in the area of enhances and improved public information and disclosure program for people living beyond the planning zone area.
I was very pleased to see the efforts of OPG by revising its public information and disclosure program to reach the greater community.

Additionally, this writer was very happy to see OPG supported the Regional Municipality of Durham and the City of Toronto with the development of a public education and awareness strategy around Pickering and Darlington nuclear power stations. These initiatives are most timely and needed, as the public often obtain the information from anti-nuclear sources that often are characterized with fear, incompleteness and just false information.
The public deserve to receive accurate information, not misinformation based on fear when it comes to the safety of nuclear generation and nuclear waste storage facilities, especially, when some of these Ontario facilities are involved with refurbishment and future decommissioning.
In my view, these efforts of NB Power Point Lepreau Nuclear Generating Station served as a template of excellence in the area of public information disclosure.

## 2.15 OTHER MATTER OF REGULATORY INTEREST

Again, NB Power / PLNGS continued its outstanding efforts in maintaining an active role in its community engagement activities of particular note, the Community Relations Team Manager has strengthened and continued to foster relationship with indigenous and local community members on various subjects /projects of mutual interest to share knowledge and experiences as well as develop greater common undertanding with Point Lepreau Operations.

These community engagement efforts at PLNGS have been recognized with a recent award. This writer has been very impressed with and appreciated the outstanding efforts of Kathleen Duguay, Manager of Community Affairs and Nuclear Regulatory Protocol, over the years of hard work in her public engagement efforts on behalf of Point Lepreau.

This writer was also very pleased to see both the licensees and CNSC continue and enhance their efforts with indigenous consultations and engagement.

Those efforts are consistent with public expectations; of particular note are the efforts of CNSC staff activities at Bruce site as reported on Page 55 to 58.
Finally in this area of "Other Matters of Regulatory Interest, this writer recognized that this important regulatory area is getting the attention needed in respect to this report. This section covers this area will compared to past reports that often had limited information.

## SECTION 3 NUCLEAR POWER PLANTS AND WASTE MANAGEMENT FACILITY PERFORMANCE AND REGULATORY DEVELOPMENTS

## SECTION 3.1 DARLINGTON NUCLEAR GENERATING STATION

These comments will focus on this writer's reactions upon reviewing this above chapter in the 2019 Oversight Report, Specifically Section 3.17 Radiation Protection / application of ALARA." This writer had difficulty understanding the statement "CNSC staff concluded that OPG performance exceeded CNSC staff's expectations with respect to the application of ALARA. This is hard to accept when the information in that section identifies that "Post outage reviews attributed this target exceedance to several factors; some of them were within OPG's control, including:

- higher than anticipated dose rates
- additional work due to the discovery of unplanned hotspots
- post execution decontamination of transport flasks
- another example where facts reported under works

Dose control section in my view does not warrant the sentences in last paragraph on page 75 just above heading "radiological hazard control." That sentence reads as follows: "*CNSC staff determined that OPG met overall expectations with respect on the fact that there were no workers at Darlington Nuclear Generating Station that exceeded their exposure control level or regulatory dose limits.* "

The above quote maybe the case but CNSC identified five non-compliances that were relevant to worker dose control. These non-compliances were associated with the following:

- inadequate planning of radioactive work
- improper selection and use of radiation personal protective equipment
- inadequate protection of contractor workgroup
- a failure to provide workers with accurate radiological hazard information prior to conducting work
- inadequate contamination control while performing work

How can CNSC conclude that OPG met overall expectations with respect to worker dose control? These above non compliances are unacceptable and inconsistent with what should never have occurred to those workers.

These non compliances, in this writer's opinion, are unacceptable and could have been prevented if those responsible had been more proactive and thorough in carrying out their own work responsibilities. The CNSC should have rated such non compliances as being below CNSC expectations.

This raises the bigger question as to what is actually met by using the word "expectations" so often seen in this report. Often one reads, they met expectations or exceed expectations but rarely, if ever, do you read "below expectation" in the area being reviewed or efforts undertaken to address any issues.

More definitive explanations would be needed if CNSC rating was in fact below expectations. For example, students who are doing their best but appear to be struggling despite best efforts, the teacher will often state the student is meeting their expectations but the fact of matter is the student's work is not up to general standards and below standard expectations.

Rarely has this reviewer read "below expectations" used in these oversight reports. There must be times that such an evaluative word would apply? Why isn't below expectations used more? This reviewer would recommend that "met expectations", "exceeded expectations" or "below expectations" be defined and made more clear.

For those workers impacted by those five non compliances listed on page 74, one could easily conclude that from their work place health and safety perspective their expectations were not met. Radiological hazard control again more example of non-compliances.
Despite OPG implementing acceptable remedial and corrective actions, these described compliances occurred. They should not have occurred in the first place if those responsible were proactively carrying out their preventative oversight work responsibilities. The CNSC should be issuing some type of enforcement penalty such as warning letter or administrative penalty. This reviewer rarely if even has seen any enforcement penalties issued such as available in New Brunswick Clean Air Act. Why is that? What are the enforcement penalties criteria, what are the options, frequency of such? There needs to be more information on the enforcement side of these Oversight Reports.

Considering that Pickering Nuclear Generating Station is scheduled to end its commercial operation by December 31, 2024, just 37 months from now with the majority of its operating reactors reaching the end of life; this writer had expected to read of problems, issues related to an old facility first brought into service in 1983.

This reviewer was thankfully and pleasantly surprised to not see any issues stand out of concern or challenges identified that would result in this facility not being able to operate safely.

This reviewer was reassured reading this chapter on the Pickering Nuclear Generating Station. This is of particular interest to this writer as my grandchildren and their families live not all that far from this facility not far from Markham, Ontario. Quite frankly, I had anticipated that considering the age of this facility, I had expected to see CNSC identify issues of concern especially with those mechanical operating parameters potentially vulnerable to age deterioration such as pressure tube fracture toughness or pressure tubes failing.

The section on aging management is important to note: Such statements as "CNSC staff confirmed that the major component life cycle management plants at the Pickering Nuclear Station continue to meet the applicable regulatory requirements in 2019." This is what community members who live in this region need to read.

"The Pickering Nuclear Generating Station is licensed to operate up to 295,000 effective full time hours (EIPH) for its pressure tubes. At the end of 2019, the longest operating pressure tubes had approximately 250,000 EIPH of service. OPG predicted the pressure tubes would not reach the current licensing limit prior to 2024" considering the age of these tubes and other potential mechanical degradation possibilities, CNSC and the licensee will need to be extra vigilant over the next three years to ensure there is no mechanical failures that could compromise the safe operation of this nuclear generating station. This writer has full confidence in the CNSC to be on top of this potential safety issue. The more this reviewer read this chapter, my confidence level increased on the safe operation of this facility despite it is getting closer to its end of operating life.

Many of the safety headings in this chapter met CSNC expectations such as maintenance. CNSC staff did not identify any safety significant issues related to maintenance associated with events reported for Pickering Nuclear Generating Station in 2019. This statement begs the questions – what were those reported events and were there safety issues but they were just were not

"significant". The Commissioners should question the CNSC staff for answers. What were those safety issues? Anything under "significant" can still be problematic and of public interest.

**Fitness for Service**

**"**OPG met the applicable regulatory requirement and its performance met CNSC's staff expectations for the Safety and Control Areas Fitness for Service at the Pickering Nuclear Generating Station in 2019. This is what the public want to see for a facility as old as this one.

## SECTION 3.3.7 RADIATION PROTECTION & SECTION 3.3.9 ENVIRONMENTAL PROTECTION

These sections are of great importance and are worthy of notation. The following statement (P.99) under worker dose control is as follows. *"Radiation doses to workers at Pickering Nuclear Generating Station were below the regulatory dose limits. As well as the action leads in OPG's radiation protection program. CNSC did not observe any adverse trends or safety significant unplanned exposures at the PNGS in 2019. Additionally, there was no report related to worker dose control in 2019."*

From a public health protection perspective, the information under 3.3.9 Environmental Protection was the most welcomed. Such statements to cause this reviewer to come to that conclusion are as follows: *"In 2019, all airborne and waterborne releases were less than the environmental derived release limits (DRL) for the respective type of releases."*

The maximum dose to the public from operations at the PNGS as estimated by OPG remained low as 1.7 uSv, versus the limit 1000 uSv. "Overall, CNSC staff observed that operations at the PNGS did not pass an unacceptable risk to human health and the environment."

This is the kind of information this reviewer needs to read considering the high population density including my family members who live not that far away from this nuclear facility.

## SECTION 3.5 BRUCE NUCLEAR GENERTING STATION

**RE: Fisheries Act Authorization**

There is no mention of the number of fish killed through impingement and entrainment due to the water intakes that draw water from Lake Huron for the cooling water systems. Other facilities reviewed in this report such as PNGS and PLNGS identify “anticipate or actual” the number of fish killed. Why wasn’t such information included in this section?

In respect to the decision by CNSC – not to assign “fully satisfactory” rating but to assign “satisfactory” ratings for all SCAs at Bruce A & Bruce B in 2019. This approach was taken for all the other sites as well reviewed in this Oversight Report.

The reason given is in the following statement on Page 14. “This was strictly because of a lack of opportunity (due to COVID-19 pandemic) for staff to assure the consistent applications criteria for fully satisfactory ratings across all SCAs.” This reviewer is having problems undertanding the reasons for this rating change decision considering that COVID-19 did not get identified as a major health problem until December 2019 reaching the first crisis decision point to lock down the country March 14, 2020 . CNSC staffs were directed to work at home but still had computer access to information to be able to make the fully satisfactory ratings.

All the information required to prepare this report (except for 2020 updates) was assessed, acquired and in your system during 2019-peiod up until December 2019 which was the cut off point for this 2019 Oversight Report. Is that not correct? If not, please respond with corrected information during the December 2020 General Meeting. Further even during the period from March on, CNSC inspectors carried out the critically required inspections and certainly carried out all required regulatory inspections and information assessments during 2019 before COVIC arrived in Canada. Both CNSC and Licensees provided update on their website.

More explanations required please for a better understanding of why this and other nuclear facilities were denied their well-deserved "fully satisfactory" ratings. Thank you.

Overall , after reviewing Section 3.5 Bruce Nuclear Generating Station various safety criteria requirements, this writer was reassured to read under Safety Culture.
"Field inspections which were used to oversee Bruce Power's activities, confirmed that Bruce Power met the applicable regulatory requirements related to safety culture." (P. 115 – last paragraph).

**Management of Contractors – Page 94**

One area that has been a past concern to this reviewer centers on the management and oversight of contractors. In my view, this area of contractors within these complex highly regulated facilities have the potential to create safety issues simply because many of these contractors are not working in these facilities on a permanent on going basis and may not be always fully aware of potential safety issues that they could create in carrying out their contracting duties. The key to avoid such potential problems rests solely on the licensees, in this case Bruce and the CNSC regulatory oversight in place.

This writer was particularly pleased to read under this section. *"In all, CNSC staff observed that Bruce Power continued to improve it oversight of contractors in 2019. Issues were resolved as they were identified with many being resolved before MCR activities began. In 2020, CNSC staff plan to further their review of Bruce Power's management of MCR contractors."* Good to see this as this community member did raise some concerns over issues identified with contractors at some facilities in the previous year Oversight Report 2018.

**Fitness for Duty – Page 117**

In respect to REGDOC 2.2.4, Fitness for Duty, Volume 11 Managing Alcohol and Drug Use. This writer was pleased to see CNSC adopt such a regulation that included random testing for alcohol and drugs. This is an excellent step to ensure public safety considering how prevalent

alcohol and drug use is in our society especially now that marijuana has been legalized. Additionally many people are on prescription medications for various medical conditions.

Reading under the conduct of licensed activities the following:
*"In 2019 CNSC staff noted that Bruce Power's operative practices were adequate and in several cases, were highly effective and carried out in a high regards for safety"*, was reassuring and positive. Question is here which ones were adequate and which ones were highly effective. Please provide a list breakdown. Such information needed elaboration in this Oversight Report.

Under Probabilistic Safety Assessment, there is one area that no doubt is covered in such an assessment - sea level rise due to climate change. There is a reference to "CNSC completing reviews for Bruce Power external hazard and external flood assessment."

Very timely and important considering how close this massive nuclear facility is close on the shores of Lake Huron. Same question of concern for Point Lepreau being very near the Bay of Fundy. This writer is on the Board of Directors for Atlantic Coastal Action Program (ACAP). That environmental group has completed a climate change / sea level rise analysis projection for future years and these studies / maps show sea level rise here in Saint John could flood part of the lower west side, street along the harbour over the next years. Have any such maps showing projected flooding been done? Please see this report: http://www.acapsj.org/climate-change-and-the-saint-john-harbour

Have PLNGS and CNSC reviewed the above mentioned report in order to understand its potential impact to PLNGS.

As part of this "external flood analysis" this should be make publically available in the public interest. This should be an update at the December 2020 meeting on how vulnerable Point Lepreau and the other nuclear facilities are to climate change sea level / storm surge flooding. Local atmospheric conditions need more attention in terms of emissions.

The other final important areas in this chapter on Bruce are in Section 3.5.7 Radiation Protection application of ALARA and 3.59 Environmental Protection.

Section 3.5.7 was reassuring to see that CNSC staff concluded that “Bruce Power met the applicable regulatory requirements and its performance met CNSC staff expectation s for SCA Radiation Protection at Bruce A & Bruce B in 2019.”

Bruce Power achieved its collective targets for planned outages in 2019 for Bruce A & Bruce B, similarly on line collective doses were lower than the dose target for both stations. This is what the public expects.

What is meant by “collective dose target” and “on line collective doses”. Does this mean certain individual workers may have had received higher exposure? Under worker dose control paragraph, it appears this may be correct “CNSC staff also noted the number of workers on higher dose categories was decreasing.”

Perhaps the answer is found in the last sentence in worker dose control which reads: “There were no action level exceedances at Bruce A & B, due to unplanned exposures and there were no exposures that resulted in a worker dose over the annual regulatory effective dose limit of 50 mSv. “ Let’s hope these workers share that the same regulatory conclusion.

**Environmental Protection - Section 3.5.9**

Considering the hundreds of thousands of people who live in the regional area reading the CNSC statement “In 2019, radiological releases to the environment from Bruce A & Bruce B were well below regulatory limits” will be reassuring and well received provided the standard used by CNSC is stringent and tough enough. Please refer to my comments in the front part of my comments.

Another statement also “CNSC staff noted that there were no significant releases of hazardous substances at the Bruce site in 2019 that posed any unacceptable risk to the environment or general public. The estimated maximum annual radiation dose to the public from Bruce site remained very low at 0.15 percent of the public dose limit.”

That limit is 1 mSv per year (as noted in Section 2.9 – first paragraph). The question raised in that newspaper article cited above in my submission is whether even that low dose is health protective. I strongly urge the CNSC Staff and Commissioners to address this recently public media story cited above to revise whether that the standard is tough enough.

**Overall comments on the Regulatory Oversight Report for Nuclear Power Generating Station sites: 2019**

Part 1 was an excellent overview about this report itself covering the introduction General and Supporting Information, Nuclear Power Plant and Waste Management Facility Safety Performance and Regulatory Development, and Conclusion for the Regulatory Oversight of Nuclear Power Generating site in 2019. This section was well organized and easy to follow and very informative.

## PART 2 – DARLINGTON REFURBISHMETN UPDATE - Unit 2

This section was most appreciated as it provided high quality information in an updated fashion on the Refurbishment of Darlington Nuclear Generating Station. It was reassuring to learn that this refurbishment is moving forward without any problems despite pandemic conditions. Considering the challenges, delays and issues that Point Lepreau Nuclear Generating facility faced during its refurbishment, it was good to see that Unit 2 at Darlington moved forward successfully. I expect that the lessons learned shared from the PLNGS refurbishment and industry assisted both CNSC and Darlington staff to carry out this refurbishment successfully when one thinks of all the potential things that could go wrong with such a complex refurbishment.

In my view it says a lot about the high level of skill, expertise both from the CNSC, the licensee to reach a successful conclusion even in the midst of a pandemic condition. Thank you for that effort.

**CONCLUDING COMMENTS**

In conclusion, this writer is pleased to be able to offer commentary on the "Regulatory Oversight Report for Canadian Nuclear Power Generating site for 2019 and Darlington Update" as part of this public review process.

This writer continues to have the utmost confidence in the Canadian Nuclear Safety Commission as you carry out your regulatory legislative mandate.

Thanks goodness that your staff is as good as they are to ensure that all Canadians and our environment are kept safe. Thank you and to the many staff who carry out their regulatory duties for a job well done. This conclusion is made after carefully reviewing this 2019 Oversight Report.

Respectfully submitted,

Gordon W. Dalzell, BA, BSW

timesglobe

ARTICLE

# RADIOACTIVE EMISSIONS ON THE RISE AT POINT LEPREAU

MIKE LANDRY
TELEGRAPH-JOURNAL

Radioactive emissions from Point Lepreau Nuclear Generating Station continue to rise eight years after it returned online following refurbishment, according to data released from the Canadian Nuclear Safety Commission.

NB Power, which operates the plant, notes the releases are small fractions of a per cent compared to the regulatory limits.

But a U.K. expert on radioactivity in the environment, reviewing the commission's Point Lepreau data, said even at 0.1 per cent of the public dosage limit the emissions are too high.

"These are very large amounts of radioactivity," said Dr. Ian Fairlie, a retired civil servant tasked with regulating nuclear plants and the former head of the U.K. government's committee on internal radiation risks.

Brunswick News questioned NB Power about Point Lepreau's release of tritium, a radioactive isotope of hydrogen.

In an email, spokesperson Marc Belliveau said tritium releases are monitored by nationally recognized standards, reviewed by the Canadian Nuclear Safety Commission and independently verified.

## 'Angels on a pinhead'

At Point Lepreau, radioactive material is emitted as gas from stacks and as wastewater piped into the Bay of Fundy. In 2019, according to the plant's most recent annual environmental report, radioactive water was detected in the air, wells, seawater and groundwater surrounding the facility.

The bulk of the radioactive releases – radionuclides – are made up of

PLEASE SEE →LEPREAU, B2

# Radioactive emissions on the rise at Point Lepreau

LEPREAU ⇢B1

tritium. Every nuclear plant produces these atoms, but Canadian heavy water reactors are especially prone to creating tritium.

Tritium is notable because like elemental hydrogen, it can bond with oxygen to create radioactive water. Although the radiation can't penetrate skin, the tritiated water liquid or vapour, if inhaled, ingested or absorbed through the skin, can be hazardous.

NB Power, in its environmental report, states the local population would be exposed to radiation as a result of the water vapour in the air, wells, diving for sea urchins, harvesting clams and dulse and eating local seafood.

For the tritium found in local drinking water around Point Lepreau, this ranged from 0.1 to 0.25 per cent of the acceptable limit. However, this standard has been argued – by Fairlie and the Ontario Drinking Water Advisory Council in a 2009 government report – to be too high, and should be drastically reduced. If that recommendation was enacted, some levels around Lepreau would be near the maximum limit.

According to NB Power, its estimated public dosage did reach a near historic high in 2019. Although estimated dosages from liquid effluent spiked with the 2008 shutdown, the estimated dosage from stack emissions were the highest last year since 1995.

However, NB Power estimates the resulting annual radiation dose from all exposures is a fraction of its operating target. The target itself is only five per cent of the regulated public dose limit.

For 2019, NB Power estimated the resulting radiation from releases was about equal to a single arm or leg x-ray. For contrast, the annual public dosing limit would be about 1,000 such x-rays.

The data supports the safety commission's 2006 conclusions, and a point reiterated in 2009, that "tritium levels in drinking water do not pose a risk to their health."

However, Fairlie distrusts the computer models used to estimate public dosing. The science used is like "calculating the number of angels on a pinhead," he said.

Although much of the studies around Lepreau concern the immediate vicinity, Fairlie said Saint John would be exposed to the tritium, too, especially in warmer months when the wind blows toward the city. As well as bonding with oxygen to create radioactive water, tritium can also bond with other proteins, carbohydrates or fats to become organically bound tritium. This means tritium can stay inside your body for longer, radioactively lingering.

The nuclear industry has long been dogged by the discrepancy between low estimates of public radiation risk and studies showing increased cancer rates surrounding nuclear plants around the world. Studies show doses should be greater than 10,000 times reported amounts before causing increased health risks. Fairlie reviewed these cancer studies in a 2013 article in the Journal of Environmental Radioactivity.

Fairlie concluded the dosage calculations of exposure to plant releases were incorrect, along with risk estimates. He highlighted that radioactive emissions usually occur in spikes, not consistent low releases – a fact NB Power details in its environmental reports. He suggests this creates a concentrated exposure not factored in calculations.

### 'No expected health impacts'

However, the Canadian Nuclear Safety Commission stands by the calculations used to estimate dosing from releases.

"The CNSC uses internationally recognized methods that have been determined to be protective of the person," wrote commission spokesperson Isabelle Roy in an email.

Roy also pointed to independent testing around Lepreau – in things like soil, wells, berries, milk and seafood – that confirmed a radiation exposure well below limits.

"There are no expected health impacts," Roy wrote.

To help reduce potential risk, all plants have set annual limits for releases. Although the safety commission reports Lepreau released nearly 600 trillion becquerels of tritium last year, its regulatory limit is more than 45 quintillion becquerels – or about 75,000 times more.

But the safety commission has considered changing its standards. A 2012 discussion paper raised the idea of tightening standards by 20 times for existing plants and demanding new facilities release no more than one percent of the current standard.

The recommendations were never instituted.

While NB Power notes that radiation from radon in homes can be 2,000 to 3,000 times the dose estimated from Point Lepreau, Fairlie calls such contrasts a red herring.

"They don't address the effect of the fact that large amounts of stuff is being emitted by nuclear power plants," said Fairlie, who has focused on the impact of these plants since 1986 and the disaster with the Chernobyl Nuclear Power Plant in Ukraine.

"We're looking at the fact they're putting out humongous amounts of tritium."

Gordon Edwards, executive director of the Canadian Coalition for Nuclear Responsibility, agrees with Fairlie, saying the measuring standards are "meaningless."

"If the nuclear industry were forthright, and defended its routine emissions as a 'necessary evil,' and was honest in its portrayal of radioactive wastes in general and medical hazards in particular, then we would be well on our way to a civilized science-based debate about energy options."