



Oral presentation

Exposé oral

**Written submission from
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**Mémoire de
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In the Matter of the

À l'égard d'

Ontario Power Generation Inc.

Ontario Power Generation Inc.

Applicability of the Darlington New Nuclear Project environmental assessment and plant parameter envelope to selected reactor technology

Applicabilité de l'évaluation environnementale et de l'enveloppe des paramètres de la centrale à la technologie de réacteur sélectionnée pour le projet de nouvelle centrale nucléaire de Darlington

Commission Public Hearing

Audience publique de la Commission

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Written Intervention submission to Canadian Nuclear Safety Commission (CNSC) regarding the applicability of a 2009 Environmental Assessment (EA) to the Darlington New Nuclear Project (DNNP) for four experimental boiling water reactors (BWRX-300)

Dear Commissioners.

Here are just some of the reasons why the GE-Hitachi and Ontario Power Generators (OPG) BWRX-300 proposal must be subjected to a whole new Environmental Assessment (EA) and subsequent Environmental Impact Study (EIS) for location at Darlington, because this design is not within the bounds of the accepted 2011 EA, and the predictions of the original EA do not remain valid.

- The BWRX-300 design proposes to dig ten stories underground. On the shores of Lake Ontario. The original Environmental Assessment did not even consider such a possibility.

However, the OPG's submission glosses over this fact, when admitting that the BWRX-300 is "outside the scope" of the original study:

"Other effects resulting from BWRX-300 deployment on quantity of soil and rock removal, air quality, blasting and ground vibrations, sound level, stormwater, and liquid effluents from dewatering operations were assessed as consistent with the EIS. This was primarily due to **the much smaller footprint** of the BWRX-300 compared to the reactors considered in the PPE. Therefore, the depth of the reactor embedment does not impact the conclusions of the EIS (*emphasis added*). (Notice of Participation at CNSC Public Hearing 2024, OPG)

Just because the work is going to be done ten stories underground does not mean its footprint is smaller. "Out of sight, out of mind" must not be applied to safety considerations regarding experimental nuclear reactor proposals.

- The BWRX-300 design plan has no consideration for its spent fuel waste streams, particularly for the core rods as they are removed from the reactor core, of unique size and radioactivity never considered in all of Canada's decades of nuclear waste management planning. The level of radiation that will come from spent fuel rods from this design is an order of magnitude far beyond anything Canada has yet dealt with, and a full, modern, independent Environmental Impact study must take this into consideration. The OPG's EIS states that, at least as far as the outside-scope weight is concerned, the problem, "will be mitigated by designing the hauling roads for the cask weight and has no impact

to the conclusions of the EIS.” The site assessment must include detailed, not imaginary plans - not just as per weight issues, but for on-site heavy water pool containment, duration, and subsequent on-site dry storage, all as per the four BWRX-300’s production lifespans. This is necessary because our nation still has not created a long-term nuclear waste storage facility that could accept this waste. Passing the buck to future generations, whether ten years or ten thousand years from now, is not acceptable.

- The BWRX-300’s (four of them), due to small containment size, will leak neutrons into surrounding water, cement, soil and lakewater, of amounts never dealt with by our nuclear industry before. This creates untold amounts of activation products - radionuclides that will get into our bodies. This was not studied in the original 2009 study, and must be addressed. The Plant Parameter Envelope does not have scope for this factor. Building a “waterproof” barrier around the experimental reactors will not stop these neutrons from affecting the rock, soil, water, and biome outside said “waterproof” barrier. Widespread contamination will occur, and is not being adequately addressed as yet in this process.
- The nature of this site has changed dramatically over the years, with increased on-site storage of used nuclear fuel, a shrunken exclusion zone, and increased proximity to increased human populations. Therefore, the old EA does not apply.
- The nature of this site is due to change if the proposed Cobalt-60 plant is built. This conflation of site dangers must be taken into consideration at this time. A fulsome, modern EA and subsequent EIS must not only consider the proposed four BWRX-300’s but also the proposed Cobalt-60 manufacturing plant.
- The GE-Hitachi BWRX-300 design is so different, a boiling water reactor never tested anywhere in the world, that over one hundred of the questions posed in the original 2011 Plant Parameter Envelope don’t even apply. The Ontario Power Generators (OPG) admits this much in their own submission on this matter to the CNSC. New replacement questions that should be applied to the health and safety concerns of the BWRX-300 *have yet to be even posed*.

Reminder: it is the mandate of the CNSC to formulate and pose such questions. In the absence of this act of posing new questions that apply to the health and safety concerns of the BWRX-300 (a duty that has been abrogated by the CNSC), an independent, modern EA is required.

Let me, a lay person, prompt the experts at CNSC for some of the health and safety concerns you might consider asking:

a) There is no secondary coolant safety system in the BWRX-300 design. This is unprecedented in the world of existing NPPs. Any questions?

b) Decommissioning will require attention to an extended site biological shield exposed to Carbon-14 due to neutron leakage throughout the reactors' lifespans (reminder, the plan is to build four of them). In particular, the oxygen-rich cement around the small, underground reactors (surrounded by and full of water, on the shore of Lake Ontario, just km's from human towns) will be full of Carbon14 - an alpha emitter. Any questions?

c) Ion exchange resins emitted during the four BWRX-300's maintenance life, such as scheduled fuel exchange, will be radioactive on an order of magnitude never seen, in Canada nor abroad. Any questions?

d) There are no safety considerations in the design proposal for scenarios in which there is a sudden catastrophic loss of coolant. Any questions?

e) The zircoloid tubes used in this design are to be exposed to extreme heat (300 degrees celsius), which produces hydrogen. Sound familiar? Think Fukushima. Any questions?

f) the fuel source has been entirely externalized in this licensing process. However, uranium fluoride is toxic, and to be made less so must be converted to uranium oxide. There is no mention of this process, nor the source of the fuel, in the proponent's design applications. This experimental and highly dangerous aspect of the proponent design ought to be accounted for in any project proposal analysis. Any questions?

g) the BWRX-300 design by nature will produce copious amounts of radioactive noble gasses, which lie closer to the ground, called 'sky-shine'. Any questions?

The 2011/2012 Joint Review Panel stated that a new environmental assessment must occur if the new proponent design is different from the originals studies, as being outside the Plant Parameters Envelopes. The BWRX-300 is an experimental underground boiling water reactor. Compared to the original designs considered, it is an entirely new creature of unknown and unexplored, and definitely unassessed impacts to Canadian environments, health, and safety.

Furthermore, there are some considerations that must be brought into focus in considering the need for a new EA and EIS.

- The local population is entirely uninformed on the dangers of the BWRX-300. Pause for a proper, independent, modern EA and EIS, with public reviews, allows for proper dissemination of information (by scientists other than those employed by the for-profit proponent) to the public for their review and consideration.

Reminder - public health and safety is purported to be the mandate of the CNSC. One would think the CNSC would be keen to mandate a new EA, seeing as the original was conducted fifteen years ago under drastically different on-site conditions for hugely different design proposals, and long before the modern era wherein all nuclear power plants are considered as viable military hostages (as per the Russian occupation of Ukraine's Zaporizhzhia Nuclear Power Plant). If not keen to require a new EA, what is the CSNC trying to hide from the Canadian public, particularly the locals?

- Perhaps most shockingly, it is evident that Canada's nuclear regulatory regime is anything but "world class":

It is the international standard to honour exclusion zones - nothing should be built within existing Nuclear Power Plant (NPP) exclusion zones - especially not experimental reactors.

Just because new nuclear fervor started in 2009 with propositions coming from a variety of foreign privately-owned startups, prompting a questionably conducted site EA in 2009, and continuing with questionable scrutiny of four project proposals as per a questionable scope (dubbed "plant parameter envelopes" - a set of ever-moving targets) throughout 2011 and 2012, and continuing today with an EIS based evermore loosely on this outdated work from a for-profit private company (OPG) desperately supporting the proposed experimental reactor design from their for-profit partner (GE-Hitachi) does not mean the CNSC ought to rely on those previous mistakes as the groundwork or necessitation for continued wrongdoing.

Is the CNSC just a rubber stamp for for-profit private nuclear power interests? If yes, this horrid miscarriage of intelligence and care for our collective safety will continue.

If not, if the CNSC truly is a body of individuals who put Canadian citizen health and safety first, ahead of profit for an industry desperate to stay relevant, the DNNP will be put on hold indefinitely, and at the very least require a new, full and independently conducted Environmental Assessment and subsequent Environmental Impact Statements.

Miss Sarah Gabrielle Baron