



Oral presentation

Submission from Louis Bertrand

In the Matter of

Ontario Power Generation Inc.

Application to renew the Power
Reactor Operating licence for the
Darlington Nuclear Generating Station

Commission Public Hearing
Part 2

November 2-5, 2015

Exposé oral

Mémoire de Louis Bertrand

À l'égard de

Ontario Power Generation Inc.

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

Audience publique de la Commission
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Submission by:
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Re: Hearing Ref 2015-H-04 - Application by Ontario Power Generation for a
Thirteen year License to Operate a Site at the Darlington Nuclear Generating Station
in Clarington, Ontario

General comments

As a resident of Bowmanville, I am concerned that the request for an unprecedented 13-year license extension closes the window of public scrutiny of the operations of the Darlington NGS. I feel that the relationship between OPG, the CNSC and municipal and provincial elected and staff officials is too "cozy". Nuclear power has the potential - as we have seen previously at Three Mile Island, Chernobyl and Fukushima - for severe accidents that can release radionuclides over wide areas, causing short term exposure and increasing the incidence of cancers in the aftermath.

Although the Commission now requires that OPG pay for the pre-distribution of potassium iodide (KI) pills to households and institutions within a 10km radius of Darlington and Pickering, the effectiveness of KI is limited to the immediate timeframe of a release of core material, and even then only for radioactive iodide. There are many other radionuclides available to be released and KI would be ineffective for those.

As detailed in the submissions by the Canadian Environmental Law Association, Greenpeace and Durham Nuclear Awareness, there seems to be a pattern of stalling serious work in developing a credible emergency plan for an INES level 7 severe accident. To my knowledge, no significant actions were taken in response to the

offsite emergency planning recommendations of the Joint Review Panel on the Darlington New Nuclear in 2011¹.

I wish to lend my voice in support of the recommendations to:

- Require OPG, Durham Region and Ontario to include an INES level 7 and early release accident in the planning basis of the Durham and provincial nuclear emergency plans;
- Require OPG to work with civil authorities to develop a credible emergency plan that includes short or long term evacuation of the primary zone, with detailed inventories of transportation capabilities and requirements, along with adequate notification of residents;
- Better define the secondary zone and clearly identify the emergency measures to be taken;
- Only grant a one-year extension of the Darlington NGS operating license and require OPG to return to the Commission with well developed plans to handle a severe accident in accordance with Regulatory Document 2.10.1.

Institutional capacity

Although the Commission is not strictly concerned with the business operations of licensees, I believe that the Commission should undertake a scrutiny of the financial operations, long term outlook, outsource practices and institutional capability to retain deep knowledge of the technical operations in order to assess the safety of the Darlington NGS over the long term.

To put it bluntly, does OPG have the long term institutional capacity to deliver on its commitments?

The focus on safety of nuclear operations by OPG and the CNSC is on a strictly technical basis - pumps, pipes, valves and control systems - as evidenced by the Probabilistic Safety Assessment². My interest is in the ability of OPG staff and management to maintain the required level of safety consciousness in the face of increasing pressures to maintain production, keep costs under control and manage the technical challenges of reconstruction. We would be wise to acknowledge that safety and production are often conflicting goals and that there is a constant temptation to take shortcuts. In my view, these pressures will only increase over the term of the planned reconstruction of the Darlington reactors to 2025 (or beyond, if

¹ Canadian Environmental Assessment Agency and Canadian Nuclear Safety Commission, "Joint Review Panel Environmental Assessment Report Summary: Darlington New Nuclear Power Plant Project."

² Wang and Krick, "Darlington NGS Probabilistic Safety Assessment Summary Report."

there are over-runs) and the risk of an accident due to human factors will increase in ways that are not captured by the PSA.

Financials

OPG's revenue has been declining steadily over the last few years (see chart Figure 1), as is the net income and electricity production (Figure 2). It is reasonable to expect that the financials will suffer even more during the requested 13-year license period due to the expense of rebuilding each reactor, compounded by the loss of electricity revenue from that reactor being out of service for three years or more. The 2014 financial report tacitly acknowledges this trend by pointing to ongoing efforts at cost savings and restructuring.

The Pickering station is set to shut down in 2020, thus depriving OPG from even more electricity revenue while adding the cost of bringing the reactors into cold shutdown and maintaining an asset that is no longer productive.

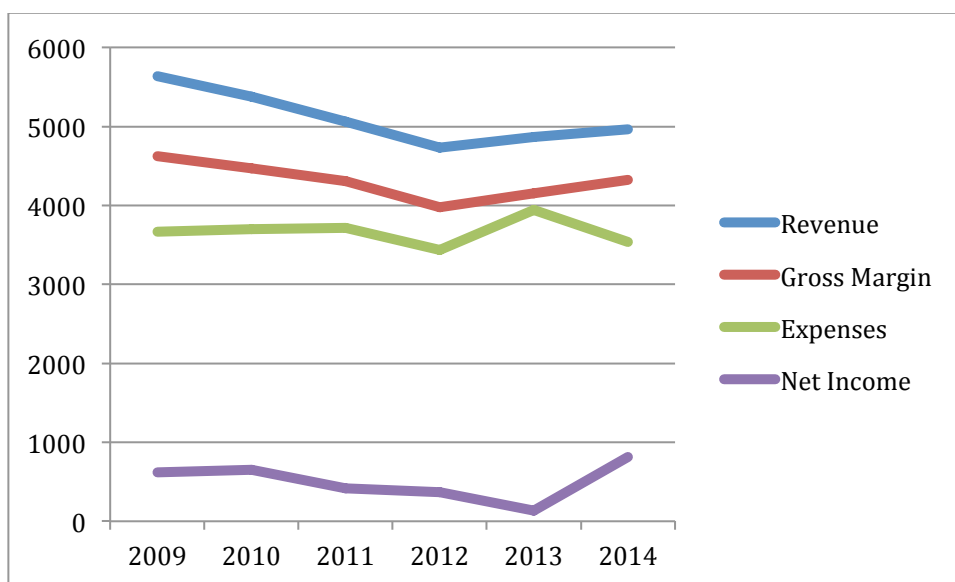


Figure 1: OPG financials 2009-2014 (source: OPG Annual Reports 2009-2014)

Furthermore, OPG no longer operates coal fired generators, and is slowly adding hydro-electric generation, e.g. the Lower Mattagami project, adding 538MW that roughly offsets the loss of coal generation. However it is unclear whether additional hydro-electric generation will grow sufficiently to help support the additional burden during the rebuilding phase, expected to last until 2025 (as long as there are no cost or schedule over-runs).

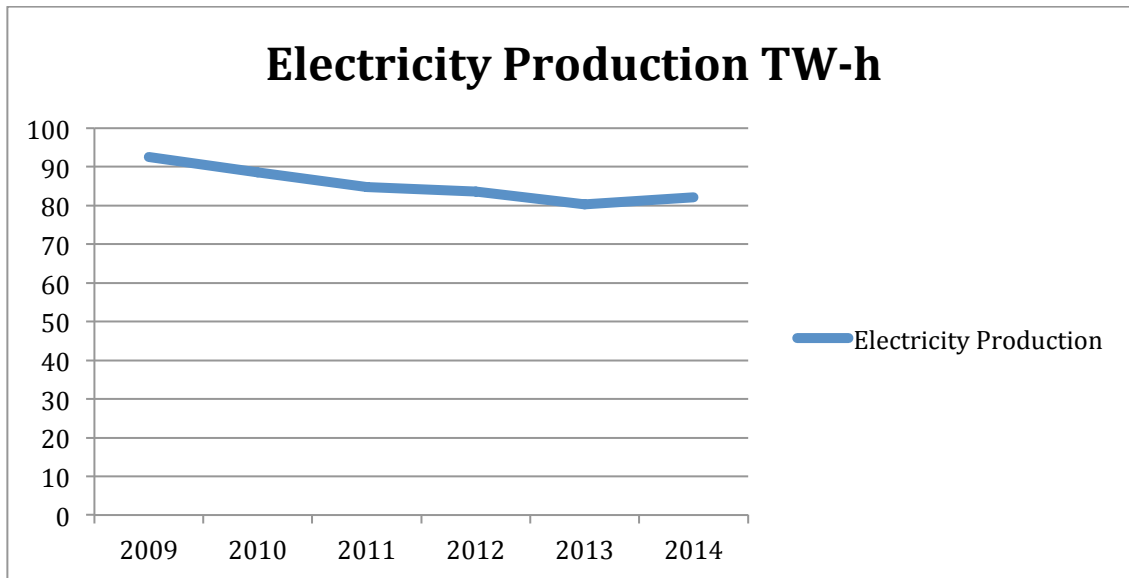


Figure 2: OPG electricity production 2009-2014 (source: OPG Annual Reports 2009-2014)

Human Resources and deep institutional knowledge

The original architects of Pickering, Bruce and Darlington are mostly either retired or no longer with us. This represents a loss of deep knowledge about station operations, unusual conditions and possible emergencies. Although OPG can be expected to be meticulous about documenting designs and operations, reading a manual or a report and actually understanding how something works are not the same thing.

I am also concerned about the recent trend to outsource engineering and planning work to external contractors, or to use contract employees from agencies such as Ian Martin Group. Over the last 10-15 years, there has been a consolidation of small engineering and consulting firms into large multinational engineering firms such as SNC-Lavalin, AMEC, Babcock & Wilcox, Rolls Royce, that are able to take on larger projects that previously would have been handled by in-house full-time permanent staff.

Case in point, the *Darlington NGS Probabilistic Safety Assessment Summary Report*³ was prepared and initially reviewed by staff at AMEC Foster Wheeler before being reviewed and accepted by OPG staff.

It would be prudent for the Commission to ask OPG how many contract employees are working on engineering projects, compared to permanent staff, and how institutional knowledge can be retained beyond the end of contracts.

³ Ibid., front page.

Long Term Electricity Supply Mix

It would be useful to remind the Commission that nuclear's large share of the Ontario electricity supply mix is supported by the political will of the Ontario government, as outlined in documents such as the 2013 Long Term Energy Plan⁴.

Table 1: Nuclear share of supply mix (Ontario LTEP December 2013)

Year	Nuclear share
2013	59%
2025	42%
2032	39%

The nuclear share of the electricity mix is reduced to 39% yet the share for solar PV barely increases from 1% in 2013 to 2% in 2032. Meanwhile, a 2015 report by Deutsche Bank⁵ notes that the cost of solar photovoltaics (PV) has come down 15% in the last 8 years and forecasts another 40% reduction over the next 5 years. The report predicts grid parity in jurisdictions with high electricity costs, such as the USA.

In the face of stiff competition from solar, the future of nuclear generation is less certain than it was a three decades ago when Darlington was under construction. It is reasonable to speculate that public pressure for lower cost electricity -- always a hot button issue in Ontario -- may force the government to alter the supply mix in favour of consumer-owned PV. This shift toward a large number of small generators would drastically alter the Ontario electricity system and large generation systems like Darlington would be at a great disadvantage because of the transmission and distribution costs associated with the large generator model.

In conclusion, my recommendation to the Commission is to only grant a limited time license - one or two years at most - and require OPG to detail its management processes to address the conflicting goals of safety and electricity production in the face of increased financial and time pressures, while suffering from a loss of deep institutional knowledge about the operation and safety of the Darlington reactors.

⁴ Government of Ontario, "Achieving Balance: Ontario's Long-Term Energy Plan."

⁵ Shah and Booream-Phelps, "Crossing the Chasm: Solar Grid Parity in a Low Oil Price Era."

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