

**EB-2016-0152 Sustainability-Journal.ca Compendium for
Panel 1C**

Topic: *Has OPG reviewed the system design options?*

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II. PURPOSE AND SUMMARY OF TESTIMONY

Q.

What is the purpose of your testimony?

A.

Pegasus-Global was engaged by Torys LLP to provide an independent and objective assessment of the degree to which Ontario Power Generation Inc.'s (OPG) plan and approach to the execution of the DRP, including the processes in place for management of costs and schedule, program controls and its application of any contingency, are consistent with the way other megaprojects and megaprograms of similar magnitude, scale, and complexity have been carried out.

Question: *Are the authors of the DRP identified? Are they all employees of OPG?*

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OPG's approach for executing the Program is consistent with the approach typically used on other megaprograms and in several areas exceed what I have seen on other megaprograms of similar magnitude, scale, and complexity.

It is my opinion that the extensive pre-execution planning that was undertaken places OPG in a favorable position to have successful execution of the Program. This pre-execution planning includes: the incorporation of lessons learned from Darlington and other nuclear projects including Point Lepreau Nuclear Generating Station, Bruce Nuclear Generating Station, Pickering Nuclear Generating Station, Vogtle Electric Generating Plant, Watts Bar Nuclear Generating Station, as well as non-nuclear megaprojects such as the London Olympics and Heathrow International Airport; the use of industry best

practices for development of the Release Quality Estimate (RQE); and, the policies, procedures, and project control tools that were developed and in use for Program execution.

Question: ***In your opinion are the Darlington, Bruce and Pickering Generating Stations very similar in their designs?***

Question: ***Do your comments apply equally to the plans for all four Darlington reactors?***

Question: ***Does the P90 confidence level assume that an extensive list of assumptions will hold true for the duration of the project?***

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Q.

Do policies and procedures evolve during the execution phase?

A.

Yes, when there is an identified need to expand, refine, or otherwise revise an aspect of project controls, the related policies and procedures will be updated to reflect these changes. Construction projects, especially megaprojects, are inherently dynamic with a variety of influences both inside and outside the project that may adjust the project controls needs. Progressive elaboration of the policies and procedures allows for a continually improved process to manage and oversee the execution based on the actual conditions of the project or program.

Question: ***How is the P90 confidence level maintained as the controls, policies and procedures evolve?***

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Q.

What is your understanding of the overall purpose and scope of the Darlington Refurbishment Program?

A.

I understand the purpose of the Program is to extend the operating life of the Darlington Station by approximately 30 to 35 years. The refurbishment involves an outage for replacement of life-limiting components, as well as an inspection and maintenance or replacement of other components that are most effectively done during the refurbishment outage.

Question: *Does this exclude alterations to the system design in order to achieve lower costs, better performance, greater safety or reliability?*

Question: *Are you familiar with the French nuclear power network, which is much less reliant on peaking stations?*

Question: *Presumably the CANDU reactors cannot readily be modified to convert them into load following systems like those used in France but might they employ another system design that does not require any modifications to the nuclear stations?*

Ontario has 8,500 MW of electricity storage capacity in its hydro ponding and Quebec has enough storage capacity to bring the storage total to more than 45,000 MW. Some of that storage capacity could be repurposed to flatten the demand load to 17,000 MW (the average power that would meet our need for 150 TWh), making the peaking stations superfluous by reducing the peak supply capacity from 36,000 MW to 17,000 MW. The repurposing could be achieved by using exergy stores (which store both electricity and heat), which would in the process further reduce the power demand to approximately 11,300 MW, which implies that we will eventually need fewer nuclear stations.

This solution would solve two Ontario problems: the high cost of electricity and the province's excessive GHG emissions, but it requires coordination of the system designs for both nuclear power and heating/cooling/DHW systems, hence the importance of bringing it up in this OEB hearing.

Question: *Should the Board and/or OPG consider this option?*

Ron Tolmie
Sustainability-Journal.ca
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