

Ontario Energy Board

IN THE MATTER OF the *Ontario Energy Board Act, 1998*;
S.O. 1998, c. 15, Schedule B;

AND IN THE MATTER OF an Application by Ontario
Power Generation Inc. pursuant to section 78.1 of the *Ontario
Energy Board Act, 1998* for an Order or Orders determining
payment amounts for the output of certain of its generating
facilities.

**INTERROGATORIES OF
ENERGY PROBE RESEARCH FOUNDATION
("ENERGY PROBE")**

SET NUMBER 1

July 29, 2010

**ONTARIO POWER GENERATION INC.
DETERMINING PAYMENT AMOUNTS
EB-2010-0008**

**ENERGY PROBE RESEARCH FOUNDATION
INTERROGATORIES – SET NUMBER 1**

Issue 1.2:

Are OPG's economic and business planning assumptions for 2011-2012 an appropriate basis on which to set payment amounts?

Interrogatory # 1

Please provide a list of OPG's economic and business planning assumptions for 2011-2012 or indicate the exhibits in the Prefiled Evidence where they may be found.

Ref: Exhibit A2, Tab 2, Schedule 1, p. 12 of 14

Interrogatory # 2

The Prefiled Evidence states that OPG's Business Case Summaries ("BCS") Guidelines have established 7 per cent as the current discount rate for OPG's economic evaluations for regulated assets.

Please provide the specific data used to calculate that discount rate.

Interrogatory # 3

The Prefiled Evidence states that OPG's discount rate is based on "OPG's long term view of the financial markets".

- a) Please indicate how OPG's long term view of the financial markets affected the calculation of the 7 percent discount rate currently in effect.**
- b) Please provide a copy of the BCS Guidelines if the document is not confidential.**

- c) To illustrate how OPG uses that discount rate, please provide a non-confidential example of the calculation that it performed in a specific business case including, inter alia, the cash flows that are the subject of the discounting process.

Ref: Exhibit F, Tab 1, Schedule 1, Attachment 1 – Regulated Hydroelectric 2010 – 2014 Business Plan

Interrogatory # 4

Page 18 of the business plan refers to “Strategic Complement” –Strategy of “over hiring” to account for unexpected attrition, high turnover, and long lead times required to hire staff.”

- a) Please describe the “over hiring” strategy in more detail.
- b) How many extra staff have been hired using this strategy? How many are attributed to the prescribed Hydro Electric facilities?
- c) Please describe any incidents of “unexpected attrition” and “high turnover” that OPG has experienced in the recent past.
- d) What are the reasons for “long lead times to hire staff”?

Issue 2.1:

What is the appropriate amount for rate base?

Ref: Exhibit A1, Tab 3, Schedule 1, p. 5 of 9

Interrogatory # 5

The Prefiled Evidence indicates that the regulated hydro rate base decreases over the period 2007-2012 and that the rate base for nuclear facilities is expected to remain stable over the period 2010-2012.

Does OPG expect the rate bases to grow beyond 2012? If so, what is the expected growth rate?

Issue 3.3:

Should the same capital structure and cost of capital be used for both OPG's regulated hydroelectric and nuclear businesses? If not, what capital structure and/or cost of capital parameters are appropriate for each business?

Ref: Exhibit C1, Tab 1, Schedule 1

Interrogatory # 6

- a) Recognizing that the Foster Associates report did not recommend separate capital structures for nuclear and hydro, what risks might support different capital structures for those two businesses?**
- b) In particular, are those risks the same as the risks to be taken into consideration in estimating the costs of equity for regulated hydro and nuclear?**
- c) Please indicate whether, from a financial perspective, weather risk and regulatory risk are properly regarded as business-specific risks of regulated hydro and nuclear respectively or part of market risk for the purpose of estimating the respective costs of equity.**
- d) Is there empirical support for the conclusion in the Foster Associates report that:**

“Average market value – All other things equal, larger firms have the benefit of diversification of assets and greater financial resources to weather economic downturns. Therefore, the larger the market value of the firm, the lower is the expected beta.” (Appendix B, p.3)

**Ref: Exhibit C1, Tab 1, Schedule 1, p. 1 of 6 &
Exhibit C3, Tab 1, Schedule 1**

Interrogatory # 7

The Foster Associates report notes (p.13) that the Board's ROE formula is for a “benchmark utility” and that differences in business risk between that benchmark and a specific regulated utility are to be reflected in differences in capital structure.

- a) Presuming there is a benchmark utility for generation, does OPG have higher or lower business risk than that utility?**

- b) What benchmark capital structure should OPG's proposed capital structure (47% debt, 53% equity) be compared with?**
- c) Should all differences in business risk be reflected in capital structure, or only those that investors cannot eliminate through diversification?**

Issue 4.2

Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Ref: Exhibit D1, Tab 1, Schedule 2, Attachment 1, Tab 1 – Business Case Summaries – Niagara Tunnel Project

Interrogatory # 8

Page 2 of the BCS refers to “comprehensive geological studies” preceeding the decision to proceed with the project.

- a) Did the geological studies identify the weakness in the Queenston shale formation that resulted in the tunnelling problems subsequently encountered by the contractor?**
- b) If yes, please explain what design features and/or construction methods were intended to deal with that weakness? Why did they not provide the expected risk mitigation?**
- c) If no, please explain why the studies did not identify the weakness and what other studies could have been undertaken to identify the weakness.**

Interrogatory # 9

Page 2 of the BCS refers to “significant challenges excavating and supporting the Queenston shale formation, due to overstressing and insufficient, unsupported stand-up time”.

- a) Please explain the causes of the “overstressing” in the Queenston shale formation. Was this overstressing condition identified by the geological studies undertaken prior to the project proceeding?**

- b) How long was the shale expected to stand up without support during the tunnelling operation?**
- c) Please describe the system intended to support the tunnel crown in the original design.**
- d) Please describe the measures taken to mitigate the lower than expected unsupported stand-up time? What impact did these measures have on the expected tunnelling progress?**

Interrogatory # 10

On page 3 of the BCS reference is made to a “target cost of \$985 M”.

- a) Does the target cost of \$985 M include the cost incurred to the date of the new DBA?**
- b) If no, is it coincidental that the target cost is the same as the original release cost of the project?**

Interrogatory # 11

On page 3 of the BCS reference is made to “a vertical realignment to exit the Queenston shale and move to the overlying rock formations where tunnelling conditions are expected to improve”.

- a) How will OPG measure whether tunnelling conditions have improved?**
- b) Who bears the risk if the tunnelling conditions do not result in improved progress of the tunnelling machine?**
- c) What is the potential cost increase if the tunnelling conditions do not improve as expected?**

Interrogatory # 12

Page 4 of the BCS refers to a “10-year holiday for Gross Revenue Charge (GRC) payments”.

- a) Please explain what the Gross Revenue Charge is.**
- b) What will the annual cost increase be once the 10-year holiday from GRC ends?**

Interrogatory # 13

Page 7 of the BCS contains a sensitivity analysis of the project costs including potential incremental costs.

- a) Overall reduction of 5% in Niagara River Flow is evaluated. Please explain what conditions might lead to a reduction of 5% in river flow and what the probability of those conditions arising is.**
- b) Higher capital costs of 10% is evaluated. Please explain how the 10% amount was arrived at. What is the probability that this amount will occur or be exceeded?**
- c) How does the higher capital cost (10% of going forward costs or about \$100 M) differ from the “Project Costs \$100 M Higher” eventuality also evaluated?**
- d) How was the increased interest during construction rate of 50 basis points arrived at? What is the probability of this rate occurring?**

Interrogatory # 14

Page 9 of the BCS shows an Explanation of Cost Variances for the project.

- a) OPG Project Management costs are forecast to be 36% higher than originally approved because of the increased duration of the project. Owner’s Representative costs are forecast to be 59% higher for the same reason. Please explain why the Owner’s Representative costs should be higher on a percentage basis than OPG Project Management costs.**
- b) Please provide a breakdown of the Tunnel Contract variance of \$458.1 M.**

Interrogatory # 15

Page 12 of the BCS states that “The Niagara Tunnel design life is 90 years without the need for any planned maintenance”.

- a) The sensitivity analysis on page 7 evaluates a shorter service life of only 30 years. Please explain why a 30-year service life was selected for evaluation when the design life is 3 times as long.
- b) What conditions might result in the lower service life?
- c) Page 1 of Appendix B to the BCS notes “annual incremental OM&A costs of \$.1 M” in Operating Cost Assumptions for the tunnel project. Please reconcile this statement with the one above i.e. “The Niagara Tunnel design life is 90 years without the need for any planned maintenance”

Interrogatory # 16

Appendix C contains the Niagara Project Major Risks Table.

- a) Please identify what party(ies) are responsible for the costs associated with what risks.
- b) Are the risks arranged in decreasing probability of occurrence? If not, please explain how the risks are ordered.
- c) Please identify the probability of each risk occurring.
- d) The risk of lower than expected TBM progress due to harder rock conditions than expected does not appear to be evaluated. Please explain why this risk is not included in the table.

Interrogatory # 17

“Report of the Board: The Regulatory Treatment of Infrastructure Investment in connection with the Rate-regulated Activities of Distributors and Transmitters in Ontario” issued January 10, 2010 provides options for accelerated cost recovery.

- a) Does OPG consider that the mechanisms for accelerated cost recovery would apply

- to any of its prescribed hydroelectric facilities?
- b) If yes, please explain why they would apply with reference to the Board report noted above.
- c) Has OPG considered applying for accelerated cost recovery for the Niagara Tunnel Project? Please explain how the decision was made.

**Ref: Exhibit D1, Tab 1, Schedule 2, Attachment 1, Tab 2 – Business Case Summaries
– DeCew Falls 1 Penstock and Saddle Replacement**

Interrogatory # 18

Page 3 of the BCS refers to “negative production impacts on the City of St. Catharines at their existing downstream Heywood GS, their proposed Schickluna GS and OPG’s proposed Lake Gibson GS.”

- a) Please explain why not replacing the penstocks at DeCew Falls I impacts downstream stations.
- b) Is a runner upgrade planned for the units during the time they are out of service for the penstock project? If yes, what is the expected cost? If no, please explain why this is not an advantageous project?

**Ref: Exhibit D1, Tab 1, Schedule 2, Attachment 1, Tab 3 – Business Case Summaries
– RH Saunders Protection and Control Upgrade Project**

Interrogatory # 19

Page 4 of the BCS refers to “Project Strategy is to award the work to a single experienced contractor who has done similar work at our stations to minimize risk to OPG”.

- a) Does this statement mean that a sole source supplier will do the work or does it mean that one contractor (as opposed to multiple contractors) will do the work involved in the Protection and Control upgrade?
- b) If the former, please explain why a sole source supplier is necessary.
- c) Please describe the “risk to OPG” referred to in the statement?
- d) Is the project currently on time and budget? If not please identify and explain any

variances.

**Ref: Exhibit D1, Tab 1, Schedule 2, Attachment 1, Tab 4 – Business Case Summaries
– Cornwall Energy and Information Center**

Interrogatory # 20

Page 1 of the BCS describes the construction of an information center in Cornwall to be used for “the delivery of information regarding OPG and its generating facilities and the history of the development and construction of the Seaway and how it affected the local communities”.

Please explain why this project should be included in the prescribed facilities ratebase?

Interrogatory # 21

The first paragraph on Page 1 contains the following statement: “The Centre will also provide stakeholders with a venue to deliver information on their areas of interest.”

Please describe the stakeholders that might be expected to use the centre and the information that they might be expected to deliver.

Interrogatory # 22

The second paragraph on Page 1 refers to a previous centre housed in the Saunders plant that was closed in 1992.

Please explain why a new centre is now necessary if the old one hasn’t been in operation for 18 years.

Interrogatory # 23

On page 2 of the BCS it is noted that “NYPA has also closed their information centre at the Franklin D. Roosevelt Power Project and have subsequently constructed a new off-site facility in view of their station”.

Please explain why NYPA’s decision to provide an information facility is relevant to the Board’s consideration of OPG’s request to include its information centre costs in rate base for prescribed facilities.

Ref: Exhibit D1, Tab 1, Schedule 2

Interrogatory # 24

Lines 19-21 on Page 11 of the exhibit makes the following statement: “The project will allow OPG to more effectively deliver its hydroelectric communications (e.g., water safety) while improving community support for continued operation of OPG’s second largest hydroelectric generating station.”

- a) How many visitors to the centre does OPG expect annually?**
- b) Please explain how the project will assist with delivery of the water safety message.**
- c) Has OPG experienced a decline in community support for the Saunders plant?
Please provide any documentation that demonstrates this decline.**

Issue 5.1:

Is the proposed regulated hydroelectric production forecast appropriate?

Ref: Exhibit E1, Tab 1, Schedule 1, p. 5 of 7

Interrogatory # 25

The Prefiled Evidence indicates that surplus baseload generation (“SBG”) increased in 2009 due to reduced electricity demand resulting from depressed economic conditions and relatively moderate temperatures as well as an increase in electricity supply. As a result, production at Niagara was reduced.

Does this indicate that, from a financial perspective, OPG’s regulated hydro business is more exposed to market risk than nuclear which, as the Prefiled Evidence indicates, serves baseload generation and is not intended to vary with market demand (Exh. E2/T 1/S 1/p.2 of 13)?

Interrogatory # 26

The Foster Associates report states:

“Nuclear capacity – A priori, it is expected that a higher proportion of nuclear capacity would be associated with relatively higher business risk and a higher beta. (Appendix B, p.3)

- a) If beta is a measure of non-diversifiable exposure to market risk, would it not be reasonable , a priori, that the beta of nuclear would be lower than the beta of hydro?**
- b) If so, what does this imply about differences in the costs of equity for nuclear and hydro?**

Issue 6.1.1

Are the amounts proposed to be included in the test period revenue requirement for other operating cost items including depreciation expense, income and property taxes, appropriate?

Ref: Exhibit A, Tab 3, Schedule 2 – Drivers of Revenue Deficiency

Interrogatory # 27

Page 2 of the exhibit refers to “prior period tax losses to eliminate any income tax obligations as a mitigation measure”.

- a) Does OPG have any more prior period tax losses that it can bring forward to continue mitigating rate increases should the Board direct that mitigation is necessary?**
- b) If yes, please describe the tax losses available and what impact bringing them forward for the test years would have on the proposed payment amounts.**
- c) If no, what other means does OPG have to mitigate the payment amounts?**

Issue 8.2

Is the revenue requirement amount for nuclear liabilities related to nuclear waste management and decommissioning costs appropriately determined?

Ref: Exhibit C2, Tab 1, Schedule 1 – Nuclear Waste Generation and Decommissioning

Interrogatory # 28

Page 3 of the exhibit refers to the management of low level and intermediate level radioactive waste storage and disposal.

Radiation hormesis (also called radiation homeostasis) is the hypothesis that chronic low doses of ionizing radiation are beneficial, having the opposite effect in small doses than in large doses. Extensive research on radiation hormesis has been undertaken by the French Academy of Sciences – National Academy of Medicine. Would acceptance of this hypothesis result in substantial reduction in the costs associated with the management of low level waste?