Board Staff Interrogatory #018

Ref: Ex. D1-T1-S2, Table 1

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

OPG indicates that it is spending about $12M in capital on a visitor centre at the Saunders facility and the $12M is deemed in-service in 2010. Please confirm whether OPG's existing Payment Amounts are recovering any costs related to this initiative. Please confirm whether OPG's proposed Payment Amounts for 2011 and/or 2012 will recover costs related to this initiative, and if so what percentage of the costs are being recovered from rate-payers, from the shareholder and from the unregulated Hydroelectric business units. If ratepayers are bearing costs associated with the initiative, please explain the benefits the ratepayers will realize from this investment.

Response

The visitor centre project is not included in OPG's existing payment amounts since it was not included in OPG's proposed capital expenditures in EB-2007-0905. However, OPG proposes to include the entire cost of the project in rate base beginning with the 2011 – 2012 payment amounts.

Consistent with the shareholder agreement and its corporate policies, OPG operates with the highest standards of social responsibility and corporate citizenship. These standards require that OPG maintain good relations with the communities which host its facilities, including First Nations. In response to a meeting with local municipal leaders in the Cornwall area and provincial officials in 2006, OPG made a commitment to consider re-opening an off-site energy information centre in Cornwall. As indicated in Ex. D1-T1-S2, Attachment 1,Tab 5, R.H. Saunders Generating Station had originally housed an energy information centre that was closed in 1992, and was not re-opened to the public due to OPG and New York Power Authority post-9/11 security concerns.

The benefits of this project to ratepayers are described in Ex.D1-T1-S2, section 4.2.2 and in the business case summary provided at Ex. D1-T1-S2, Attachment 5.

The benefits described in those two exhibits include:

- Operating large generating stations in any community requires maintenance of long-term support from the community. The centre will play an important role in enhancing OPG's support within the local community with key stakeholders. OPG invests considerable effort in reaching out to its site communities and provincial residents to keep them informed about its operations and plans for the future. Without that strong local support OPG would have more difficulty in conducting its business. The centre will provide a venue for delivery of information regarding OPG and its generating facilities and the history of the development and construction of the St. Lawrence Seaway and how it affected the local communities. It will provide a venue for both OPG and local stakeholders to deliver information regarding their areas of interest. It will also act as a focal point to showcase the historical contribution hydroelectric power has made to Ontario – and continues to make – as a source of clean, renewable, and affordable power.

- The centre will serve as an integral component of OPG's campaign for Waterways Public Safety, proving especially valuable in delivering messaging that promotes safety around dams and hydropower stations. Ratepayers have a legitimate interest in the safe operation of OPG's facilities. In addition, it will provide information regarding OPG, opportunities for future hydroelectric power expansion, and career opportunities in OPG.

- This facility will serve as an educational venue for schools to teach students about power generation. It will also provide a year-round facility for local community and educational groups for meetings, art displays, and other cultural events thereby enhancing OPG's involvement and reputation within the local community. Other centre stakeholders will also have the opportunity to display information on their areas of interest in space allocated for that purpose in the new centre. In particular, the centre will allow OPG to strengthen its relationship with the Mohawks of Akwesasne.

Board Staff Interrogatory #019

Ref: Ex. D1-T1-S1

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

Please provide variance explanations for (i) the difference between 2008 actual and 2008 Board-approved and (ii) between 2009 actual and 2009 Board-approved for Hydroelectric Capital Expenditures.

Response

The OEB's Decision in EB-2007-0905 (page 44) states "The Board also accepts the balance of the capital budget for 2008 and 2009". The Decision did not make a finding related to the budget for the Niagara Tunnel and Sir Adam Beck Generating Station G7 conversion projects.

OPG provides variance explanations for 2008 and 2009 budget vs. actual at Ex. D1-T1-S1, section 6.0. These are effectively the comparisons requested in the interrogatory, however, they also include information on variances for the Niagara Tunnel and Sir Adam Beck Generating Station G7 conversion projects. The "Budget" data for both 2008 and 2009 used for the variance explanations and presented in Ex. D1-T1-S1, Table 2 is the same as the capital "Plan" data for 2008 and 2009 presented in EB-2007-0905, Ex. D1-T1-S1, and accepted by the OEB.

Board Staff Interrogatory #020

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

The Financial Sensitivity Analysis presented on page 7 of the Niagara Tunnel Project Business Case Summary (BCS) shows a Levelized Unit Energy Cost (LUEC) of 6.8 cents and a Revenue Requirement of 8.7 cents per kWh.

a) Please confirm which per kWh rate would be included in the calculation/determination of Payment Amounts when the project is put into service (assume a full year, say 2014).

b) Please confirm whether or not the Hydroelectric Payment Amount of 3.738 cents per kWh proposed for the 2011-12 test period does not include any costs associated with the Niagara Tunnel project.

c) Please confirm whether the “economic analysis” included in the BCS for other Niagara Group projects include the additional “flow” resulting from the Niagara Tunnel project they will be able to harness. If there are such benefits please identify them, and explain why OPG chose not to include them in a Net Present Value analysis of the Niagara Tunnel Project.

Response

a) The estimated revenue requirement for the incremental energy (i.e., 1.6 TWh annually) from the water supplied by the Niagara Tunnel to the Sir Adam Beck Generating Stations is $0.087/kWh (2014 dollars). The forecast impact on the revenue requirement for OPG’s regulated hydroelectric production shown at page 6 of the BCS for the Niagara Tunnel Project is an increase of $0.004/kWh. The actual impact will depend on forecasts of costs and production made at the time OPG seeks to include the project in rate base.

b) There are no amounts for the Niagara Tunnel Project entering rate base during the test period, and no impacts on revenue requirement other than those already included in the payment amounts established in EB-2007-0905. The regulated hydroelectric payment amount for 2011 – 2012 includes the continuing impact of two matters associated with the Niagara Tunnel Project that occurred prior to the OEB assuming jurisdiction for the regulated hydroelectric facilities on April 1, 2008. The regulated hydroelectric rate base includes an amount for the completed accelerator wall that was placed in service in 2007. The accelerator wall is part of the existing International Control Dam (required primarily for ice management on the river) and is considered part of the Niagara Tunnel project because the tunnel's intake configuration required replacement of the accelerator wall. The in-service addition in 2007 was $19.2M, out of the total estimated project cost of $1.6 billion and was included in the asset values that the OEB was required to accept under section 6(2)5 of O. Reg. 53/05 in setting OPG's initial payment amounts.

Additionally, prior to April 1, 2008, OPG elected to claim early Capital Cost Allowance ("CCA") related to the Niagara Tunnel Project. The test period payment amounts include the benefit of this election, which results in a reduction to regulatory income tax expense of $21.8M for the test period.

c) All Niagara Plant Group business cases that have been approved since the start of the Niagara Tunnel project have used economic analysis based on the increased diversion flows and related energy production that are forecast from the new tunnel. In addition to capturing the increased production expected from the new diversion tunnel, projects that introduce new equipment (e.g., Sir Adam Beck I Generating Station unit upgrades) often provide for more efficient use of both existing and new diversion water flows. These incremental benefits, and associated costs, have not been included in the Niagara Tunnel Project Net Present Value analysis since these decisions were taken after the approval of the tunnel project. However, business cases and other analyses for projects undertaken subsequent to approval of the tunnel that use the increased water made available by the tunnel include these incremental benefits.

Board Staff Interrogatory #021

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1, page 6

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

The BCS states that “the estimated project cost of $1,600 M includes a negotiated target price for completion of the Niagara Tunnel by Strabag….”. In this regard please clarify whether or not OPG continues to be at risk for Niagara Tunnel Project cost overruns?

Response

The design build contract with Strabag for completion of the Niagara Tunnel includes risk sharing as well as schedule and cost incentives and disincentives. OPG has high confidence that the contingency allowance included in the $1,600M estimated project cost is sufficient to address the remaining project risks.

AMPCO Interrogatory #007

Ref: Ex. D1-T1-S1

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

OPG reports at page 5 that a section of tunnel liner failed after the renegotiation with Strabag was completed. Please indicate the cost, cost responsibility, and schedule implications of this failure.

Response

The cost of the failed initial lining remedial work is approximately $2M and is part of the actual tunnel construction cost paid by OPG. Although the remedial work delayed the tunnel boring machine mining by seven weeks, the contractor's current forecast indicates that tunnel construction will be completed by the negotiated target completion date.

AMPCO Interrogatory #008

Ref: Ex. D1-T1-S2

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) Throughout the evidence with respect to the tunnel project, OPG identifies the original in-service as June 2010. On September 14, 2005 OPG issued a press release identifying the in-service date as "late 2009". Please comment on this difference.

b) In EB-2007-0905 Exhibit D1/1/1, OPG's evidence was that the non-tunnel Beck expenditures were primarily focused on the rehabilitation of generators G7, G9, and G10 at the SAB 1, with planned in-service dates of 2008, 2009, and 2010 respectively. G7 was completed in June 2009. G9 is forecast to be completed at the end of 2010 according to D1/1/2 Attachment 1 Tab 4 p. 7 and is described in D1/1/2 p. 10 as "on schedule". G10 is now scheduled to be in-service in December 2014. Please discuss the factors that are causing across-the-board schedule slippage.

Response

a) The difference is schedule contingency included in the originally approved Business Case Summary ("BCS") for risks retained by OPG as discussed on page 7 of the original Niagara Tunnel project BCS (EB-2007-0905, Ex. D1-T1-S2, Attachment A).

b) The G7, G9 and G10 upgrade program was originally planned such that the units would be available in time to take advantage of the additional water supply associated with the Niagara Tunnel project. As described in Ex. D1-T1-S1, page 6, this schedule was revised for the G7 frequency conversion because the time required to complete the necessary work exceeded the estimated outage duration. Lessons learned from this first unit rehabilitation have been applied in the planning for the subsequent rehabilitation projects. Also, given the revised tunnel in-service date, it was decided that unnecessarily compressing the unit upgrade schedules with additional engineering resources, additional construction crews as well as overlapping unit outages was not preferable from a cost or resourcing perspective.

AMPCO Interrogatory #009

Ref: Ex. D1-T1-S2, Attachment 1, Table 1

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) At page 2, the Niagara Tunnel project is described as being originally approved by the OPG Board on July 28, 2005 with an expected in-service date of June 2010. Please provide the presentation to the OPG Board that was the basis for the Board's approval of the project.

b) The Background on page 2 indicates that preparation for the new Niagara Tunnel began in 1982, that detailed engineering studies were undertaken and that an environmental assessment was approved by the Minister of the Environment in 1998. Yet on page 9 the reported progress is at a rate 27% of the planned rate. What engineering analysis was the basis of the 2005 approval and what actions have been taken against the engineers responsible for the erroneous estimate?

c) What portion of the currently estimated cost to complete the tunnel project does OPG claim is outside the jurisdiction of the OEB for the purposes of the ultimate prudence review?

d) Please confirm that some of the worst instances of overbreak with the current project have occurred where the tunnel path has intersected bore holes used to investigate the geology for tunneling purposes. Please indicate OPG’s opinion as to whether the bore holes could have been protected better when decommissioned after being drilled for investigative purposes so as to protect the rock better for subsequent tunneling.

e) The Financial Sensitivity Analysis presented on page 7 of the Niagara Tunnel Project Business Case Summary (BCS) shows a Levelized Unit Energy Cost (LUEC) of 6.8 cents/kWh and an equivalent PPA of 9.5 cents/kWh. Please outline the factors that cause the difference between the two results.

f) The second table on page 9 indicates that starting March 3/2009 until its completion, the forecasted average rate of progress of the tunnel per day was to be 8.4 meters. Please confirm that over the period from March 3, 2009 until July 3, 2010 that rate of progress was approximately 7.05 m/day. Please indicate the impact of the slower rate of progress on the remainder of the project schedules and costs.

g) In calculating the cost-effectiveness of the tunnel project, OPG assumes that the costs associated with adding incremental generation capacity at Beck units, such as SAB 1 G9, ought not to be considered. Please justify this assumption.

h) In renegotiated the design/construct deal with Strabag in 2009, OPG moved from a fixed price/fixed date contract structure to a "target cost" contract. Please compare the major commercial terms of the original and renegotiated contract.

Response

a) OPG declines to respond to this question because it addresses the original project approval, which is covered by Section 6(2)4 of O. Reg. 53/05, and because the request goes well beyond "a status update" and into matters that are covered by the OEB's express determination not to review the prudence of projects that will not close to rate base in the test period.

b) OPG declines to respond to this question because it addresses the original project approval, which is covered by Section 6(2)4 of O. Reg. 53/05. In addition, the scope of this question which involves "the basis of the 2005 approval and what actions have been taken against the engineers responsible for the erroneous estimate," goes well beyond "a status update" and into matters that are covered by the OEB's express determination not to review the prudence of projects that will not close to rate base in the test period.

c) The original release amount of $985.2M is outside the jurisdiction of the OEB for the purposes of a prudence review, as per Section 6(2)4 of O. Reg. 53/05.

d) The worst overbreak did not occur where the tunnel intersected boreholes. There was significant overbreak throughout the tunnel excavation in the Queenston shale from 800 metres to 4,500 metres along the tunnel. The partial failure of the initial tunnel lining (rockbolts, wire mesh, steel ribs and shotcrete) that occurred in September 2009 at about 3,600 metres was in the vicinity of an existing borehole that remained open as a groundwater monitoring well. The original tunnel route would not have intersected this borehole, but with tunnel realignment this borehole was intersected. Based on the realignment, grouting of this borehole in advance of the tunnel excavation would likely have been beneficial and all other boreholes in close proximity to the new tunnel alignment have been sealed by grouting.

e) There are two assumptions giving rise to the differences between the $0.068/kWh Levelized Unit Energy Cost ("LUEC") and the $0.095/kWh Power Purchase Agreement ("PPA"). The first difference is that the LUEC is calculated in 2009 dollars. The tunnel analysis was updated in 2009 to reflect the higher total project cost. LUEC's are usually quoted in dollars of the current year to allow comparisons with other projects. The PPA was calculated in 2014 dollars as this would be the first full year that the tunnel would be in-service. The second difference involves the escalation. By definition, LUEC escalates at Consumer Price Index ("CPI") after 2009. In the case of PPA, only 20 per cent of the PPA price escalates at CPI and only after 2014.

f) From March 3, 2009 to July 3, 2010, the average Tunnel Boring Machine ("TBM") advance rate was 7.11 metres per day and included substantial excavation in the Queenston shale formation where TBM advance rates were expected to be less than the overall average of 8.4 metres per day. The 8.4 metre per day advance rate is the weighted average of different predicted advance rates in the various rock formations to be encountered along the remainder of the revised tunnel alignment. One of the lower predicted TBM advance rates was in the Queenston shale formation and higher TBM daily advance rates were predicted in most of the rock formations above the Queenston shale. TBM mining is currently only a few days behind the Target Schedule for this activity despite the interruption associated with the September 2009 partial failure of the initial tunnel lining.

g) Please see response to Interrogatory Ex. L-1-020, part c).

h) The original design build contract was for a fixed price with bonuses and liquidated damages tied to the in-service date and the flow capacity of the tunnel. The amended design build contract includes a settlement of all claims prior to its effective date with completion of the tunnel at cost and includes incentives and disincentives tied to the Target Cost, the Target Schedule and the flow capacity of the tunnel (the flow capacity term is unchanged from the original design build contract).

CCC Interrogatory #015

Ref: Ex. D1-T1-S1, page 2

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

The Niagara Tunnel Project was approved by the OPG Board on July 28, 2005 with an estimated in-service date of 2010. In May 2009 OPG approved a revised estimate of $1.6 billion and a revised in-service date of December 2013. Please explain, in detail, what type of reporting OPG plans to do with respect to this project during the test year period.

Response

OPG external reporting on this project during the test period is expected to include:

- Management's Discussion and Analysis included with OPG's Quarterly and Annual Financial Statements.
- Periodic updates of the project website.

OPG's confidential internal reporting on this project is expected to include:

- Quarterly status reports to the OPG Risk Oversight Committee and Board of Directors.
- Monthly written status reports.
- Weekly verbal reports to OPG's Executive Management Team.

CCC Interrogatory #016

Ref: Ex. D1-T1-S2

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

OPG has provided a Business Case Summary for the Niagara Tunnel Project dated May 2009. Please explain how, if at all, the parameters of the project have changed since this analysis was undertaken. Specifically does OPG have updated projections of the cost of the project and the potential in-service date? If so, please provide that update.

Response

No, OPG's current forecasts are consistent with the approved Business Case Summary, i.e., a total project cost of $1.6B and an in-service date of December 2013.

CCC Interrogatory #017

Ref: Ex. D1-T1-S1, page 13

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

The evidence states that if during the execution of a hydroelectric project, the cost projection at completion is forecast to exceed the approved project budget, a superseding BCS is prepared to document the status of the project, the causes of the forecast over-expenditure, the management actions taken to-date to control costs, and all viable cost control or scope adjustment options for management consideration. For all projects schedule to be going into service during the test period please indicate whether a superseding BCS was prepared. Please file any such documents.

Response

None of the hydroelectric projects for which OPG filed a business case summary ("BCS") has required a superseding BCS.

CME Interrogatory #015

Ref: Ex. B1-T1, Ex. D1, Ex. D2, and Ex. D3

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Issue Number: 4.5
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the nuclear business appropriate and supported by business cases?

Interrogatory

Please provide a breakdown of the Capital Budgets for Hydroelectric and Nuclear, separately, listing, year by year beginning January 1, 2011, each of the projects that will be one year or less in duration, each of the projects that will be two years or less in duration, and each of the projects that will take more than two years to complete and put in service.

Response

Hydroelectric
OPG interprets this as a request for information on the duration of Regulated Hydroelectric capital projects that are forecast to begin in 2011 and end in 2011; or begin in 2012 and end in 2012; or begin in 2011 and end in 2012. These projects are listed in the table below.

Regulated Hydroelectric - Capital Projects Starting and Ending in 2011 and 2012

Line No.	Project Description	Number of Projects	Total Project Cost ($M)	Average Cost Of Projects ($M)
		(a)	(b)	(c)
	Projects starting and ending in 2011			
1	Projects >$10M Total Project Cost	0	0.0	0.0
2	Projects $5M - $10M Total Project Cost	0	0.0	0.0
3	Aggregate Total All Projects <$5M	2	1.2	0.6
	Projects starting and ending in 2012			
4	Projects >$10M Total Project Cost	0	0.0	0.0
5	Projects $5M - $10M Total Project Cost	0	0.0	0.0
6	Aggregate Total All Projects <$5M	3	1.3	0.4
	Projects starting in 2011 and ending in 2012			
7	Projects >$10M Total Project Cost	0	0.0	0.0
8	Projects $5M - $10M Total Project Cost	0	0.0	0.0
9	Aggregate Total All Projects <$5M	3	2.5	0.8
10	**Total**	8	4.9	0.6

Nuclear

OPG interprets this as a request for information on the duration of Nuclear capital projects that are forecast to begin in 2011 and end in 2011; or begin in 2012 and end in 2012; or begin in 2011 and end in 2012. OPG Nuclear has no such projects.

CME Interrogatory #016

Ref: Ex. B1-T1, Ex. D1, Ex. D2, and Ex. D3

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Issue Number: 4.5
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the nuclear business appropriate and supported by business cases?

Interrogatory

For those projects that will not be completed and in service by December 31, 2012, show, year by year and cumulatively, the amounts that OPG plans to spend in order to complete each of those multi-year projects.

Response

Hydroelectric
Regulated Hydroelectric capital projects are listed in Ex. D1-T1-S2, Tables 1, 2, and 3. There are three projects over $10M, three projects between $5M and $10M, and four projects under $5M with both cash flows in 2011 or 2012, and in-service dates after 2012. They are listed with their cash flows in the table below.

Regulated Hydroelectric - Capital Projects In-Service after 2012

Line No.	Project Name	Project Number	Final In-Service Date	Total Project Cost (M$)	2009 LTD Actual ($M)	2010 Budget ($M)	2011 Plan ($M)	2012 Plan ($M)	Future Plan ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	Projects >$10M Total Project Cost								
1	Niagara Tunnel Project	EXEC0007	Dec-13	1,600.0	648.0	241.8	288.0	199.0	223.2
2	Sir Adam Beck I GS - Unit G10 Upgrade	SAB10050	Dec-14	29.5	0.0	0.0	0.0	2.4	27.1
3	R.H. Saunders - Station Service Replacement	SAUN0080	Dec-17	10.7	0.0	0.0	0.2	0.9	9.6
	Projects $5M - $10M Total Project Cost								
4	Sir Adam Beck Pump GS - Governor Replacement	SABP0033	Dec-13	5.6	0.0	0.5	1.5	1.8	1.8
5	Sir Adam Beck Pump GS - 13.8 kV Breaker Replacements	SABP0034	Mar-13	5.9	0.0	0.1	2.0	3.0	0.8
6	R.H. Saunders GS - Replace Static Excitors	SAUN0079	Dec-13	5.1	0.0	0.0	0.1	2.5	2.5
7	**Aggregate Total All Projects <$5M**			13.9	0.0	0.2	1.3	2.9	9.6

Forecast project costs beyond 2012 are provided in aggregate form, as the requested level of detail is unrelated to OPG's current application

Witness Panel: Hydroelectric
Nuclear Projects

Nuclear

As shown in Ex. D2-T1-S2 Tables 1a, 2a and 2b (taking into account data corrections as noted in Ex. L-2-012), there are six projects that are planned to be completed after December 31, 2012. None of the projects making up the totals shown in Ex. D2-T1-S2, Table 3 have completion dates after December 31, 2012.

The requested information on these six projects is presented in the table below.

Line No.	Facility	Project Name	Project Number	Final In-Service Date	Total Project Cost (M$)	2009 LTD Actual ($M)	2010 Budget ($M)	2011 Plan ($M)	2012 Plan ($M)	Future Plan ($M)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1	DN	Fuel Handling Power Track Improvement	31438	Feb-13	17.4	7.6	4.4	2.8	1.7	0.9
2	DN	Improve Maintenance Facilities at Darlington	31717	May-13	57.7	4.7	13.7	15.4	10.5	0.4
3	DN	Shutdown System Computer Aging Management	33955	Nov-13	17.2	1.9	3.2	4.9	2.7	4.4
4	NPT	Controlled Area Improvements (1)	25902	Nov-13	15.0	1.5	0.5	3.3	9.4	0.4
5	DN	Turbine Generator Vibration Monitor System Replacement	33819	Dec-13	8.0	1.2	0.3	2.5	0.3	3.7
6	DN	Fuel Handling Simulator Project	31430	Dec-13	5.9	1.8	0.3	2.5	1.0	0.3

Note 1: Total project cost (as presented in from Ex. D2-T1-S2 Table 1a) has been corrected here.

Forecast project costs beyond 2012 are provided in aggregate form, as the requested level of detail is unrelated to OPG's current application.

Energy Probe Interrogatory #008

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

Page 2 of the BCS refers to "comprehensive geological studies" preceding the decision to proceed with the project.

a) Did the geological studies identify the weakness in the Queenston shale formation that resulted in the tunneling 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.

Response

a) Geotechnical investigations and analysis of rock samples completed for this project on the Queenston shale indicated its relatively lower strength, lower rock mass, lower quality, higher variability and higher horizontal stresses relative to the overlying sedimentary rock formations. This information was provided to the design build contractor as part of OPG's Request for Proposals in 2004.

b) The selected tunnel boring machine and construction methodology provided for installing initial rock support (steel ribs, wire mesh, rockbolts and shotcrete) in the tunnel crown immediately behind the tunnel boring machine cutterhead. At times the Queenston shale failed over the top of the cutterhead, before initial rock support could be installed. Rock is not a uniform material and can vary considerably over a short distance, and rock behaviour during tunneling cannot be precisely predicted from investigative boreholes and adits. These provide representative data for only a small percentage of the rock to be excavated. Consequently, tunnel designs and construction methods are based on experience and interpretation of the geotechnical parameters. Actual rock conditions and behaviour during tunnel construction cannot be fully known before the excavation is complete. Subsurface conditions always remain a significant risk to both design and construction of tunnel projects.

c) Not applicable. See response to part a).

Energy Probe Interrogatory #009

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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?

Response

a) Overstressing in the Queenston shale resulted from a combination of the relatively high horizontal stress, the relatively weak rock mass and the relatively thin layers in the rock mass. While the presence of high horizontal stress and relatively weak rock mass were known from the geotechnical investigations, the thin bedding was not apparent in the boreholes or the exploratory adit. During tunnel excavation, the high in-situ horizontal stress in the rock gets redistributed around the opening and stresses are concentrated in the crown and invert. The thin layers within the Queenston shale were unable to support their own weight, the rock fractured and overbreak resulted before the planned initial rock support could be installed.

b) At the contractor's originally predicted average tunnel boring machine ("TBM") advance rate of 14.5 metres per day, stand-up time for the unsupported rock was expected to be about nine hours.

c) Initial rock support in the tunnel crown included steel ribs, wire mesh, rockbolts and shotcrete in various combinations depending on the rock conditions encountered during TBM excavation.

d) Modifications were made to the initial support area on the TBM to facilitate the installation of pipe spile umbrellas, in some areas. These were used to pre-support the overlying Queenston shale and to facilitate the safe advance of the TBM. They also facilitated the removal of loosened rock over the cutterhead with subsequent support of the stable rock mass up to four metres above the intended profile. With pipe spile umbrellas, TBM advance was limited to an average of about two metres per day. With removal of the loosened rock above the cutterhead, the contractor was able to achieve TBM advance rates averaging about eight metres per day in the Queenston shale.

Energy Probe Interrogatory #010

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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?

Response

a) Yes.

b) Not applicable. See response to part a).

Energy Probe Interrogatory #011

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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 tunneling conditions are expected to improve”.

a) How will OPG measure whether tunneling conditions have improved?

b) Who bears the risk if the tunneling conditions do not result in improved progress of the tunneling machine?

c) What is the potential cost increase if the tunneling conditions do not improve as expected?

Response

a) OPG will measure improvement in conditions by the tunnel boring machine (“TBM”) advance rate and reduced overbreak in the tunnel crown.

b) Risk is shared between OPG and the contractor through agreed baselines for progress and overbreak in the remaining sections of the tunnel.

c) The potential cost increase would depend on the conditions encountered, but OPG has high confidence that cost and schedule contingencies in the approved Business Case Summary (“BCS”) address the risks to OPG associated with remaining tunnel construction.

Energy Probe Interrogatory #012

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries – Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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?

Response

a) As described in Ex. F1-T4-S1, the Gross Revenue Charge ("GRC") refers to taxes and charges that owners of hydroelectric generating stations must pay under section 92.1 of the *Electricity Act, 1998*. The GRC consists of two components: water rentals and property tax.

b) The method of calculating is defined in O. Reg. 124/02. This regulation also provides for the ten-year holiday from GRC. The GRC is determined by multiplying a station's annual generation by a deemed rate of $40/MWh and by the appropriate GRC rate. The Sir Adam Beck Generating Station pays highest marginal total GRC rate of 36 per cent of gross revenues on production over 700 GWh per year. Therefore, using the current GRC rates, the incremental 1.6 TWh of production expected as a result of the Niagara Tunnel Project will result in an additional GRC cost of approximately $23M annually after the expiration of the GRC holiday.

Energy Probe Interrogatory #013

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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?

Response

All sensitivities have been run to stress the Levelized Unit Energy Cost ("LUEC"), Power Purchase Agreement ("PPA") and revenue requirement values should the forecast of cost or production information change from the base assumptions. The levels of the sensitivities are chosen as typical values.

a) Typical conditions that might lead to a change in river flow include variation in precipitation and snowmelt. The 5 per cent reduction in river flow represents a typical amount used for sensitivity analysis when testing the financial evaluation results. The probability was not rated.

b) Higher capital costs of 10 per cent is a typical amount used for sensitivity analysis when testing the financial evaluation results. The probability was not rated.

c) At the time of creating the Superseding Release for the Niagara Tunnel Project (Ex. D1-T1-S2, Attachment 1), the current project costs incurred were approximately $0.5B (as per footnote 3 on page 7). For this reason, the “Higher Capital Costs (+10% going forward costs)” and the “Project Costs $100M Higher” are not fundamentally different values ($110M versus $100M respectively). As such, the sensitivity impacts are not fundamentally different.

d) The 50 basis point increase in interest during construction was deemed to be an appropriate level to be used to measure and evaluate the sensitivity resulting from this change on the financial results. The probability was not rated.

Energy Probe Interrogatory #014

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

a) The estimated costs for the Owner's Representative include provisions for additional monitoring associated with the extended duration of activities, such as the tunnel boring machine mining, and for several concurrent tunnel construction activities (e.g. invert concrete lining, profile restoration, arch concrete lining, contact grouting, and pre-stress grouting).

b) Details of the Tunnel Contract variance of $458.1M are confidential. OPG declines to provide this information as it is not relevant to the "status update" review that the OEB is undertaking for this project in this Application.

Energy Probe Interrogatory #015

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries – Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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 $0.1M" 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."

Response

a) The 30-year service life sensitivity is an extreme case to test the robustness of the tunnel economics to service life assumptions. As identified in part b), the premature failure of the tunnel lining with an inability to repair it could be a possible reason for shortening the life of the tunnel.

b) Premature failure of the tunnel lining requiring earlier than planned tunnel dewatering and repair.

c) The estimated annual average OM&A costs cover testing, inspection and maintenance on the tunnel outlet gate's mechanical, electrical and control systems; tunnel performance monitoring; and, periodic testing to confirm flow rates.

Energy Probe Interrogatory #016

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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 tunnel boring machine 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.

Response

a) Cost and schedule impacts associated with risks included in this table are the responsibility of OPG and have been addressed through cost and schedule contingencies included in the approved Business Case Summaries.

b) No. The risks are listed in the order in which they were identified.

c) When the BCS was developed, the probability of occurrence of these risks was assessed as follows:
   - Risks 1, 2, 3, 5 and 15 were all Low.
   - Risks 4, 7, 8, 9, 10, 11, 12, 13 and 14 were all Medium.
   - Risk 6 was High.
   - Risks 16, 17, 18 and 19 were not rated.

d) The risk was not considered to be a major risk requiring evaluation because none of the sedimentary rock layers expected to be encountered along the Niagara Tunnel route is particularly hard and because the tunnel boring machine had no difficulty excavating through any of the rock layers overlying the Queenston shale on the decline from the outlet portal.

Energy Probe Interrogatory #017

Ref: Ex. D1-T1-S2, Attachment 1, Tab 1 – Business Case Summaries
Niagara Tunnel Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

"*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.

Response

a) Yes.

b) Please see the response to the interrogatory in Ex. L-1-011.

c) OPG considered applying for inclusion of Construction Work In Progress ("CWIP") in rate base for the Niagara Tunnel Project, but decided against it. The project was very far advanced and therefore most of the advantages of CWIP in rate base treatment would not be realized. The in-service amount for the project could not be sufficiently reduced to avoid rate shock and the majority of the funding for the project was already assured.

Energy Probe Interrogatory #018

Ref: Ex. D1-T1-S2, Attachment 1, Tab 2 – Business Case Summaries
DeCew Falls 1 Penstock and Saddle Replacement

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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?

Response

a) The natural river flow in 12 Mile Creek is much lower than the water flow introduced into the river via the DeCew Falls I and II Generating Stations. Since there are no sluiceways to pass water around the DeCew Falls I and II Generating Stations, if the penstocks are not replaced at DeCew Falls I Generating Station then less water would flow from the Welland Canal, through DeCew Falls, and into 12 Mile Creek. This loss of flow would lower the available water and energy production for both upstream and downstream hydroelectric stations, including the existing Heywood Generating Station and the proposed Lake Gibson and Schickulan Generating Stations.

b) No, runner upgrades are planned to be installed after the completion of the penstock project. Due to the time required to complete the model testing necessary to design more efficient runners, and the time to procure new runners for installation, the upgrades could not be completed during the current station outage.

Energy Probe Interrogatory #019

Ref: Ex. D1-T1-S2, Attachment 1, Tab 3 – Business Case Summaries – R.H. Saunders Generating Station Protection and Control Upgrade Project

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

a) One contractor will do all of the work related to the R.H. Saunders Generating Station Protection and Control Upgrade Project as opposed to multiple contractors. Competitive bids were sought for this project.

b) Not applicable. See response to part a).

c) The process control system affects many different aspects of the plant operation. Integration of all plant systems is essential. Multiple contractors could lead to potential conflicts between different systems where OPG would be responsible for making the systems work with each other and bearing the associated cost. A single contractor is commercially responsible under the contract to ensure all systems and sub-systems are integrated and work well together.

d) The project is currently on time and on budget.

Energy Probe Interrogatory #020

Ref: Ex. D1-T1-S2, Attachment 1, Tab 5 – Business Case Summaries Cornwall Energy and Information Centre

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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 rate base?

Response

See the response to Interrogatory L-01-018.

Energy Probe Interrogatory #021

Ref: Ex. D1-T1-S2, Attachment 1, Tab 5 – Business Case Summaries Cornwall Energy and Information Centre

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

The list of stakeholders is included on page 3 of the Business Case Summary:

- City of Cornwall
- United Counties of Stormont, Dundas and Glengarry
- Iroquois and South Dundas Chamber of Commerce
- Akwesasne First Nation
- Lost Villages Historical Society
- St. Lawrence Seaway Management Corporation
- Cornwall and Seaway Valley Tourism
- St. Lawrence College
- St. Lawrence River Institute of Environmental Sciences
- St. Lawrence Parks Commission

Each stakeholder can present information which relates to the impacts of the construction and operation of the St. Lawrence Seaway and the R.H. Saunders Generating Station.

Energy Probe Interrogatory #022

Ref: Ex. D1-T1-S2, Attachment 1, Tab 5 – Business Case Summaries Cornwall Energy and Information Centre

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

As described in response to interrogatory Ex. L-01-018, OPG is responding to the expressed concerns of local community leaders in the Cornwall area.

Energy Probe Interrogatory #023

Ref: Ex. D1-T1-S2, Attachment 1, Tab 5 – Business Case Summaries Cornwall Energy and Information Centre

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

The New York Power Authority ("NYPA") power project is physically connected in the middle of the river with the R.H. Saunders Generating Station. The operation of their facility is similar to OPG's. NYPA has a long-term relationship with the communities in which it operates and requires support from them just like OPG. Therefore, comparisons are normal and appropriate. The reference in the business case summary to the NYPA Energy Information Center is intended to illustrate why a location physically separate from the generating station is necessary to mitigate security concerns.

Energy Probe Interrogatory #024

Ref: Ex. D1-T1-S2

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

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.

Response

a) Exact visitor numbers are not available. However, OPG is expecting this venue to be quite busy based on: 1) the popularity of the former energy information center located on the sixth floor of the plant administration building, and 2) the response received from stakeholders.

b) The water safety message will be integrated with the story of how the generating station was built and the ongoing impact and importance of hydroelectric energy production in the province of Ontario.

c) The recent community issues centre around the fact that OPG does not pay municipal taxes to the City of Cornwall since the introduction of Gross Revenue Charges in 2001 (see Ex. F1-T4-S1). These issues are described in a speech made by John Murphy, Executive VP – Hydroelectric, to the City of Cornwall Chamber of Commerce in 2008, which is Attachment 1 to this response.

John Murphy
Executive Vice President: Hydro
Ontario Power Generation
Cornwall Ontario
February 11, 2008

NOTES FOR REMARKS

Introduction

Thank you for that introduction, John. Good afternoon, everyone. I appreciate the opportunity to meet with you and talk a bit about OPG. I have looked forward to this event for some time. I enjoy the Cornwall area and am looking forward to getting to know many of you better.

OPG and the Cornwall community share a long and productive history going back some 50 years and more. Over the next few minutes, I'd like to share with you my thoughts on our relationship and some of the ways we intend to enhance it going forward.

Overview of OPG

Before doing that, I want to first give a brief update of OPG and our operations. As you'll see, a lot has been happening that you may find interesting.

For those who may not be familiar with us, OPG was established as a commercial company in 1999. 100 per cent of the company's shares are owned by the Province of Ontario.

Our primary business is to generate electricity. Unlike our predecessor, Ontario Hydro, we are not responsible for generating virtually all of Ontario's electricity needs. We are one of several producers within Ontario's hybrid electricity market.

We are, however, the largest electricity producer in Ontario and generate about 70 per cent of the electricity consumed in the Province. We do this through our balanced and flexible portfolio of nuclear, fossil-fuelled, and hydroelectric generating stations. As you will hear from me today, we are proud of the role we fulfill in the market and the electricity we provide to Ontario.

Nuclear Operations

The nuclear side of our business consists of three nuclear stations in the Durham region east of Toronto. We operate 10 nuclear reactors at these facilities and are in the process of placing two others in safe storage. Our nuclear units represent about 30 per cent of our installed generating capacity. In 2007, they produced about 29 per cent of all the electricity consumed in Ontario.

Our Darlington nuclear station, which had an excellent year in terms of performance, produced nearly 18 per cent of Ontario's electricity in 2007. Darlington is recognized by its peers as one of the top performing nuclear stations in North America.

We are currently exploring the prospect of building potential new nuclear units at our Darlington site, to meet Ontario's growing electricity needs. If approved by our Shareholder, this will be a significant undertaking, creating major employment and other opportunities for many local communities in Ontario.

We are also exploring the possibility of refurbishing our Pickering B and Darlington nuclear stations as they approach the end of their performance lives. Since we're a commercial company, any decision to proceed with either of these refurbishments will be based on a solid business case.

Fossil Operations
OPG also operates five fossil-fuelled stations across Ontario, accounting for approximately 30 per cent of our capacity. These stations are used primarily to help meet periods of peak electricity demand each day and are especially valuable in meeting electricity needs when demand is at its highest – such as in the summer. Their ability to start up and shut down relatively quickly makes them ideal for this task. OPG takes pride in operating its fossil stations in an environmentally responsible manner. Today, they generate fewer smog-producing emissions than in the 1980s, while generating the same amount of electricity or more. We have also launched a biomass testing program at some of our fossil plants to help reduce carbon dioxide emissions.

Another of our fossil initiatives is the Portlands Energy Centre which we are constructing in downtown Toronto in partnership with TransCanada Energy. Portlands is a 550 MW combined cycle gas facility. The project is on budget and on time and will be producing its first power this summer. It will be fully operational in 2009.

Turning from gas to coal, OPG has been directed by our Shareholder to stop burning coal at its coal-fired stations by 2014. Between now and then, we will continue to operate them efficiently, productively and responsibly – with targeted investments to maintain their operational strength. This strategy has contributed to improved reliability at our fossil stations. In 2007, our fossil reliability was the best it's been since 2000.

Hydroelectric Operations
I now want to turn to what I consider the best part of generating fleet – our hydroelectric business. OPG owns and operates 64 hydroelectric stations and over 238 dams on 26 rivers across Ontario. These stations have an average age of 73 years – the youngest being 13 years and the oldest being 108 years old. Our Chats Falls station on the Ottawa River recently celebrated 75 years of service.

As you would expect, it's critical to keep these assets well maintained. And we do. Since 1992 our runner upgrade program has added over 425 MW to our hydroelectric capacity – including 12 MW in 2007.

Good maintenance and equipment reliability also contributed to the excellent availability of our hydro stations. In 2007, our hydro stations were available to produce electricity well over 90 per cent of the time when the water was there. That is the best availability rate we have had since 1984 and represents top quartile performance with the industry.

Overall, our hydro stations account for 31 per cent of OPG's capacity and in 2007 produced 21 per cent of all electricity consumed in Ontario.

Hydroelectric Expansion
Our hydroelectric stations are extremely valuable assets for the Province. The power they produce is clean, renewable, cost effective and reliable. This is no small advantage in a world deeply concerned about preserving clean air and mitigating climate change.

The Ontario government has recognized the importance of hydropower and has made it part of OPG's mandate to expand our hydroelectric presence in Ontario. We currently have two design-build projects whose construction we are overseeing.

One is the Niagara Tunnel, which is a 10.4 kilometre tunnel being excavated under the city of Niagara Falls. It will allow our Beck generating stations to increase their average annual energy output by 1.6 TWh – which is enough energy to power a city twice the size of Niagara Falls**.** Once constructed, the tunnel will remain in service for about 100 years before any maintenance is needed. I wish I could say that same thing about my car's operating performance!

Our other project is the 12.5 MW Lac Seul hydroelectric station in northwest Ontario, which we expect to have finished later this year.

In addition to these initiatives, we also have a number of proposed hydroelectric projects in various stages of development across Ontario. These include a major expansion project on the Lower Mattagami River that would add about 450 MW to our hydro capacity…as well as smaller potential projects on the Upper Mattagami, Abitibi, Montreal, and Little Jackfish Rivers and elsewhere.

In addition, this past December the Ontario Ministry of Energy directed a key agency – the Ontario Power Authority – to negotiate Energy Supply Agreements on many of these proposed projects. This will provide revenue certainty to OPG and will significantly facilitate their progress.

Our progress on many of these projects is dependent on reaching successful settlements – including equity participation agreements – with First Nations groups. OPG has an official First Nations policy approved by our Board of Directors. We also have a number of outreach initiatives underway within First Nations communities. In 2007, we settled two past grievances with First Nations groups and signed Agreements in Principle with three others to resolve outstanding issues. We are currently conducting a number of additional negotiations and discussions with other First Nations communities. We look forward to their positive outcome.

OPG and the Cornwall Community

As you can see, hydroelectric power and its ongoing development are very much on OPG’s agenda. We are committed to hydropower and we are committed to communities that host our hydroelectric facilities and other assets. This includes the Cornwall community – where we’ve had a relationship, as I said, for more than 50 years.

And the foundation of our relationship – its bedrock, if you will – is the R.H. Saunders generating station right out there on the great St. Lawrence River.

Saunders is celebrating its 50th year of operation this year. It’s the flagship station in our hydroelectric fleet. Along with our Beck generating stations near Niagara Falls, it is the most prestigious and storied of all our assets. It’s also a symbol of our commitment to this community.

That commitment is strong. It’s based on trust, accountability, openness and responsibility – a responsibility to do our part and to give back to the community by contributing to its quality of life and economic development.

Over the years, OPG has lived up to its responsibility. Here are a few examples of how we contribute:

- Since 1990, OPG and its predecessor company – Ontario Hydro – have invested about $140 million dollars in the Saunders generating station to maintain the plant’s high level of reliability. We plan to continue to make investments that will improve the performance of the station. These investments often benefit local businesses and other elements of the community.

- Also at Saunders, we employ about 65 employees. Many live in the region, own homes and raise their families here. In doing so, they contribute around $4 million annually to the local economy through consumer spending

- In 2007, our Corporate Citizenship Program contributed $95,000 to help support nearly 50 local initiatives. These included the Cornwall Community Hospital; Future Arena Project; Liftoff 2008; the City of Cornwall Alert Network; Seaway Valley Crime Stoppers, the St. Lawrence River Institute; and the Eastern Ontario Children's Water Festival.

- Our most recent effort was a $25,000 donation made last month to the Cornwall Community Hospital Foundation to help fund a new ultrasound machine.

- OPG also helps support many cultural, environmental, health-related, and amateur sports initiatives across the community. In June of last year, we contributed substantially to the construction of a new beach house for the Village of Iroquois.

- On the safety front, around 3,000 students in Cornwall and the United Counties received information last year on water safety. This information was communicated through presentations in schools; at local fairs; at community events; and at venues like the Eastern Ontario Children's Water Festival.

- We also supported, through advertising, the new Akwesasne Lacrosse Stadium field.

- In keeping with our commitment to openness and transparency, we mailed out last December more than 140,000 copies of our Ottawa/St. Lawrence Plant Group newsletter – *Neighbours* – to residents throughout our host communities.

- Each year OPG also provides achievement awards to six area high schools to help graduating students. Two awards are given to each school and are individually valued at $500.

These are representative examples only. If I added up all the initiatives OPG has helped support in Cornwall over the past three years, they would total more than 100 – at a value of about $150,000. This is in addition to the numerous hours of volunteer work our employees willingly perform in the community.

These contributions are not hand-outs or charity. They are investments that we believe help contribute to the quality of life in the Cornwall area. You have given us your advice, your trust and the licence to operate in your community. As a good corporate citizen, it is only natural that we would want to invest in the community that has given us so much. This is a “win-win” situation. I believe it’s helped solidify the bonds between OPG and Cornwall and contributed to a more positive and effective partnership between us.

Tax Issue

Even the best relationships, however, are sometimes subject to strain through misunderstanding – which brings me to the recent issue involving the Saunders generating station and payments in lieu of property taxes.

This issue dates back to 2001 when the Ontario Government, our Shareholder, passed legislation changing the tax treatment of hydroelectric facilities owned by OPG and other power producers.

Under that legislation, property taxes paid to municipalities and school boards by hydroelectric generators were eliminated. In their place, the legislation created a Gross Revenue Charge into which hydro producers like OPG made payments that we had previously made to municipalities. In return, the new legislation provided for full compensation of municipalities for the money they had received under the older system. This compensation is in the form of grants-in-lieu of property taxes and is paid by the provincial government.

Here’s where the problem arises. **Since that time,** property values of hydroelectric stations – including Saunders – have been reassessed significantly higher by the Municipal Property Assessment Corporation (MPAC). These assessments are independent of the grants-in-lieu paid by the province.

The whole issue is a tax policy issue and falls under the authority of the Ontario Ministry of Finance. Despite this, it’s been suggested that OPG is somehow the bad guy. That is simply not true. We are paying our fair share under the Gross Revenue Charge mechanism – as we have done since the legislation was changed in 2001. We will continue to pay our fair share of these taxes – as mandated by law – under the GRC.

In my opinion, your best course of action is to take this matter up with the Ontario government. This is not an OPG issue. It’s an issue between the Cornwall area community and the Province. That is the level where the matter should be discussed and hopefully settled.

I’m glad to have the opportunity to address this issue. It does a disservice to our record of involvement in the community and to the positive relationship we have fostered with you over the years. I truly hope that as we go forward it will be resolved to everyone’s satisfaction.

New Information Centre and Saunders 50th Anniversary Celebration

Having made that point, we will not allow this issue – or any issue – to overshadow our relationship with you, which is most important to us.

Our commitment to Cornwall will continue to be strong, active and ongoing.

It is in this spirit that OPG is establishing a major public information centre adjacent to the Saunders generating station. Among its functions, the Centre will be a setting for the Cornwall community to tell its story about its role in the development and success of Saunders over the past 50 years.

It will also act as a focal point to showcase the historical contribution hydroelectric power has made to Ontario – and continues to make, as a source of clean, renewable and affordable power. Few Ontarians today appreciate the full significance that hydroelectricity, Saunders and Cornwall have played in their history. This Information Centre will help address that, by giving us the opportunity to communicate the facts to a wide audience.

In addition, the Centre will provide valuable information on OPG’s safety initiatives – including our public water safety program.

We also believe the new Centre will attract more tourists to the region and encourage them to extend their visits here – overnight and even longer.

To ensure that all stakeholders were represented and their views heard, we held several meetings late last year. Some of you were at those meetings. As a result, a strong consensus for the Centre has been achieved, and we are ready to move this important initiative forward. The project is now in the design stage, but we hope to start construction soon. We are targeting the Centre to be open to the public in 2010.

Parallel to this initiative, we will – as I mentioned – be celebrating in June of this year the 50th anniversary of the official opening of Saunders. It will be a premier event, worthy of the heritage of this great power facility and its performance as a safe, reliable and clean producer of electricity. Planning is well underway. It includes arrangements for an official ceremony, an open house, station tours and displays highlighting the history of the station.

On the evening of June 27, which is a Friday, there will be an event at St. Lawrence for employees, retirees and our stakeholders. As some of our most important stakeholders, you are all invited to attend and we look forward that.

The following day – Saturday, June 28, from 10AM to 3PM – there will be an Open House at Saunders for the general public. We hope to see to you there as well. During the open house, there will be an unveiling of a special commemorative plaque at 1PM. Full details of the entire celebration will be available shortly, so stay tuned.

We expect the event will generate considerable spin-off benefits for the community. We are very excited.

Conclusion

If I had to sum up in a few words what I just spent the last 20-30 minutes talking about it would simply be that OPG is an integral part of the Cornwall community. As part of this community, we believe we have a responsibility to you. This means many things.

It means operating our facilities safely, efficiently and in a manner that sustains the environment.

It means contributing to the community and supporting those institutions that help make the Cornwall area a better place to live – for everyone.

And it means having pride in the community – pride in our heritage; pride in who we are; and pride in what we can together accomplish going forward.

I believe OPG is fulfilling its responsibility in all these areas. We will continue to do so. The Cornwall area community can depend on OPG.

Thank you. I'd be happy to answer any questions.

PWU Interrogatory #004

Ref: Ex. D1-T1-S1, page 1, line 32 to page 2, line 6 states:

> As described in Ex. F1-T1-S1, section 2, the Hydroelectric Business Unit uses a structured portfolio approach to identify and prioritize projects. Projects are then administered using the project management process that is described in section 7.0 below. The hydroelectric project portfolio is approved through OPG's business planning process, which includes approval of the capital project budget (as well as the project OM&A budget) by OPG's Board of Directors ("the OPG Board"). Prior to beginning work on a project, funds are released in accordance with OPG's Organizational Authority Register through the approval of a business case summary.

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) Please indicate if OPG has displaced, over the period 2007 - 2009, ongoing works or activities related to either capital or OM&A expenditures for its hydroelectric business due to business planning decisions to reduce the portfolio budget in favour of other higher priority projects that impact the short-term and/or long-term reliability of the regulated hydroelectric generating units?

b) If your response to a) is yes, please describe such projects/expenditures that were displaced.

c) What are the impacts of displacing the projects described in response to b)?

d) Please indicate if OPG is planning to displace, over the period 2010-2012, ongoing works or activities related to either capital or OM&A expenditures for its hydroelectric business due to business planning decisions to reduce the portfolio budget in favour of other higher priority projects that impact the short-term and/or long-term reliability of the regulated hydroelectric generating units?

e) If your response to d) is yes, please describe such projects/expenditures that were displaced.

f) What are the impacts of displacing the projects described in response to e)?

Response

a) During the 2007 – 2009 period, OPG did not displace any significant capital or OM&A activities at the regulated stations as a result of business planning decisions. The portfolio management approach utilized in the hydroelectric business is described in Ex. F1-T1-S1, section 2. In general, it places a higher priority on investments in high value facilities which include the regulated hydroelectric stations.

b) Not applicable. See response to part a).

c) Not applicable. See response to part a).

d) In preparing plans for 2010 – 2012 period, OPG did not displace any significant capital or OM&A activities at the regulated stations as a result of business planning decisions. The same planning approach was used as for the 2007 – 2009 period described above in part a).

e) Not applicable. See response to part d).

f) Not applicable. See response to part d).

PWU Interrogatory #006

Ref: Ex. B1, Tab 1, Schedule 1, Table 1 indicates that net fixed assets in the hydroelectric rate base are declining from $3.89B in 2007 to $3.77B in 2012, as accumulated depreciation is rising more quickly than new investment.

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) Did OPG remove any hydroelectric projects from its plan, at the direction of its shareholder or its executive management, primarily to mitigate ratepayer impacts?

b) If the answer to part a) is yes, please provide a description of the removed projects, including the investment amounts and timing thereof.

Response

a) No.

b) Not applicable.

SEC Interrogatory #044

Ref: Ex. D1-T1-S2, Attachment 1 (Niagara Tunnel Project)

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) P. 1. Please provide a copy of the report and recommendations of the Dispute Review Board.

b) P. 1. Please provide a copy of the agreement with OEFC increasing the facility limit to $1.6 billion.

c) P. 1. Please show full calculations of the LUEC of under 7 cents and the equivalent Power Purchase Agreement price of under 10 cents, in both cases including all necessary assumptions and the sources for those assumptions.

d) P. 3. Please provide a copy of the non-binding Principles of Agreement in 2008 and the non-binding Term Sheet in February 2009.

e) P. 3. Please advise the members of the Major Projects Committee in November 2008.

f) P. 3. Please provide the agreement or other document setting out the new arrangement between the Applicant and Strabag, including the Project Execution Plan.

g) P. 12. Please provide a copy of the Chestnut Park Accord Addendum.

h) P. 12. Please confirm that the methodology for forecasting the cost of the project is the same as that used for the original budget estimates.

i) P. 12. Please provide a copy of the analysis on which the XXXX month contingency is based.

j) App. B. Please re-run the cost model using the higher ROE now being sought by the company, and report the impact on the results.

Response

a) OPG declines to provide the requested document as a review of this document would necessarily involve inquiry into issues that are not relevant to an update of the project's current status, but relate instead to matters that are covered by the OEB's express determination not to review the prudence of projects that will not close to rate base in the test period.

b) Attached is the Amending Agreement to the Credit Facility Agreement between OPG and the OEFC for the purpose of financing the Niagara Tunnel Project (Attachment 1).

c) The requested calculations are shown in Attachment 2.

d) See response to part a).

e) David McMillan (Chair), Ian Ross, Marie Rounding, Bill Sheffield, David Unruh.

f) See response to part a).

g) OPG declines to produce this document because it is not relevant to a status update for the Niagara Tunnel project. The Chestnut Park Accord Addendum (“CPAA”) outlines the protocol that OPG has agreed to follow for trades work assignment on OPG work. In the case of the Niagara Tunnel which is new construction, all of the construction work was assigned as Building Trades work.

h) Yes, the same cost model (Work Breakdown Structure and Cost Breakdown Structure) is being used.

i) See response to part a).

j) The Niagara Tunnel Project costs model was re-run based on a return of equity of 9.85 per cent. The following are the resulting changes. The Levelized Unit Energy Cost (“LUEC”) and Power Purchase Agreement (“PPA”) rates are not affected as the discount rate of 7 per cent is unchanged (see response to Interrogatory L-6-002 for details).

AMENDING AGREEMENT NO.2

This Amending Agreement is made as of July 21, 2010

BETWEEN: **ONTARIO POWER GENERATION INC. ("OPG")**
As Borrower

AND: **ONTARIO ELECTRICITY FINANCIAL CORPORATION ("OEFC")**
As Lender

WHEREAS OPG and OEFC entered into the Credit Facility Agreement dated September 21, 2005, as amended by the Amending Agreement No.1 dated as of September 26, 2007 (the "Credit Agreement"), providing for OPG to borrow from OEFC an amount of up to one billion dollars;

AND WHEREAS the parties wish to increase the amount which OPG may borrow under the Credit Agreement to one billion, six hundred million dollars;

AND WHEREAS the parties wish to include a Make-Whole Amount provision in respect of the prepayment of an Advance Outstanding for any Advance which is made after July 31, 2010;

AND WHEREAS the parties wish to change the date until which OPG may receive Advances under the Credit Agreement to December 31, 2014;

AND WHEREAS the parties wish to change the minimum principal amount for Advances to $20,000,000.00 and the minimum increment for the principal amount of Advances to $5,000,000.00;

THEREFORE, in consideration of the mutual covenants and agreements herein contained and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and subject to the terms and conditions hereinafter set out, the parties agree that the Credit Agreement is amended as follows:

1. The Recital is deleted and replaced by the following:

   "OPG has requested to borrow from OEFC an amount of up to One Billion, Six Hundred Million Dollars for the purpose of financing the construction of a third tunnel to the Sir Adam Beck generating stations at Niagara Falls, Ontario (the "Project") and OEFC has agreed to lend such amount to OPG on the terms and conditions set out herein."

2. Section 1.1. Definitions is amended as follows:

a.) The definition of "Advances Outstanding is deleted and replaced by the following:

""**Advances Outstanding"** means, at any time, an amount equal to the aggregate principal amount of all Advances outstanding at such time and "Advance Outstanding" means the principal amount outstanding of any Advance."

b.) The definition of "Commitment" is deleted and replaced by the following:

""**Commitment"** means, at any time, an amount equal to the principal amount of One Billion, Six Hundred Million Dollars.", and

c.) The following definitions are inserted:

""**Make-Whole Amount"** in respect of an Advance Outstanding means the amount determined by OEFC as described in Schedule 3.

"Prepayment Amount" means the amount determined in accordance with Section 2.5.

"Prepayment Calculation Date" means the date three Business Days prior to the Prepayment Date.

"Prepayment Date" means, in respect of the prepayment of Advances, the prepayment date set forth in the Prepayment Notice., and

"Prepayment Notice" has the meaning specified in Section 2.5."

3. Section 2.5 is deleted and replaced by the following:

"**Section 2.5 Prepayments.**

(1) OPG shall have the right, at its option, to repay at any time, in whole but not in part, any Advance Outstanding under this Agreement by payment to OEFC of the amount calculated in accordance with this section (the "Prepayment Amount").

(2) The Prepayment Amount shall be calculated as the sum of the following:

(a) the Advance Outstanding to be paid on the Prepayment Date;

(b) the accrued and unpaid interest as of the Prepayment Date on the Advance Outstanding to be paid on the Prepayment Date; and

(c) for the prepayment of any Advance Outstanding which represents an Advance made after July 31, 2010, the Make-Whole Amount, if any, applicable to the Advance Outstanding to be paid on the Prepayment Date.

(3) OPG shall provide OEFC with written notice of its intention to prepay any Advance Outstanding not more than 90 calendar days and not less than 30 calendar days prior to the date OPG intends to make such payment (the "Prepayment Date"). The Prepayment Date shall be a Business Day. The notice ("Prepayment Notice") shall specify: (a) the Prepayment Date; and (b) OPG's covenant to pay the Prepayment Amount on the Prepayment Date. The Prepayment Notice is irrevocable and binding on both parties.

(4) On the Prepayment Calculation Date, OEFC shall provide OPG with written notice setting out the calculation of the Prepayment Amount, including a reasonably detailed calculation of the Make-Whole Amount and the assumptions used in making such calculations. An example of such calculation is set forth in Schedule 3 attached to this Agreement.

(5) OEFC shall give OPG one Business Day to review the calculations, after which the calculation of the Prepayment Amount shall be binding on OPG, absent manifest error."

4. Section 3.1 is deleted and replaced by the following:

"**Section 3.1 Advances**

OEFC agrees, on the terms and conditions of this Agreement, to make Advances to OPG under the Credit Facility from time to time on any Business Day prior to December 31, 2014. OPG shall not request more than four Advances per calendar year without first obtaining the prior written consent of OEFC. It is anticipated that OPG will request these Advances approximately quarterly throughout a calendar year."

5. Section 3.2 is deleted and replaced by the following:

"**Section 3.2 Procedure for Advances.**

OPG shall provide OEFC with written notice requesting an Advance at least 10 Business Days prior to the date of the Advance. Each such notice (a **"Borrowing Notice"**) shall be substantially in the form of Schedule 1 and shall specify: (a) the date of the Advance (the **"Advance Date"**); (b) the principal amount of the Advance which shall be in a minimum amount of $20,000,000.00 (unless otherwise agreed to by OEFC), and in increments of $5,000,000.00; (c) the Repayment Date of the Advance which shall be for a term not exceeding ten years; and (d) the Interest Payment Dates. OEFC shall calculate the Applicable Spread as of the date that is 5 Business Days before the Advance Date and shall advise OPG of the Applicable Spread by no later than close of business on the 4th Business Day before the Advance Date. The interest rate that shall apply to such Advance shall be set in accordance with the procedure set forth in section 3.4."

6. The attached Schedule 3 is inserted after Schedule 2 of the Agreement.

IN ALL OTHER RESPECTS, the Credit Agreement is confirmed by the parties.

IN WITNESS WHEREOF the parties hereto have executed this Amending Agreement as of the date first written above.

ONTARIO ELECTRICITY FINANCIAL CORPORATION

By: ______________________
Name: Michael D. Manning
Title: Chief Operating Officer

ONTARIO POWER GENERATION INC.

By: ______________________
Name: Colleen Sidford
Title: Vice President Treasurer

And: ______________________
Name: Donn Hanbidge
Title: Chief Financial Officer

SCHEDULE 3

Calculation of Make-Whole Amount and Example Calculation

For the purposes of this Schedule 3, the following terms shall have the meanings assigned to them below:

"OPG Market Price" means the price that is calculated using the OPG Interpolated Yield for the remaining term to maturity of the Advance Outstanding as of the Prepayment Calculation Date.

"OPG Interpolated Yield" means the interpolated yield calculated by using a Province of Ontario Yield Curve.

"Province of Ontario Yield Curve" means the yield curve that is constructed of only issues with an active, whole-bond float of at least CAD $2 Billion in size.

OEFC will calculate the Make-Whole Amount as the OPG Market Price multiplied by the amount of the Advance Outstanding that is to be repaid.

If the shape of the Province of Ontario Yield Curve for the remaining term to maturity is convex, then a cubic-spline method for interpolation will be used (i.e. the interpolation will follow the curvature of that portion of the yield curve). If the constructed yield curve is concave at this term, a linear (i.e. straight line) method of interpolation will be used.

Example

On 22 April, 2005 OEFC provided OPG with an Advance for $75 million at 5.575% for a term of 10 years. OPG gives notice to prepay the Advance Outstanding of $75 million on February 4, 2010.

Prepayment Date:	Feb 4, 2010
Repayment Date of original Advance:	April 22, 2015
Coupon Rate:	5.575%
OPG Interpolated Yield:	2.875%

Ontario issues used for Interpolation (linear)

ONT 4.5% 08 MAR 2015 ($3.0B Float):	*2.839%*
ONT 4.4% 08 MAR 2016 ($3.0B Float):	*3.135%*

OPG Market Price:	112.99
Make-Whole Amount:	\$75 million x ((112.99 – 100)/100) = \$9.7 million

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L-12-044
Attachemnt 2

Costs - Present Value

Capital Costs	($M)	886.5
Operating Costs		
GRC	($M)	117.8
OM&A	($M)	1.1
Capital Tax	($M)	3.8
Large Corporation Tax	($M)	0.6
NPV - Total (2005$)	($M)	1009.8

Assumptions:

1) PV date July 1, 2005
2) Operating cash flows assumed to occur in June of each year
3) Discount Rate 7%
4) Total Project cost of $1.6B (includes $286.6M of Interest During Construction)
5) 100% assigned to Capital Cost Allowance (CCA) Class 1 which includes "Dams, tunnel, buildings & other structures"
6) Capital costs include working capital requirements which has been calculated assuming:
   a) on average revenues paid to OPG based on a 37 day lag
   b) on average OPG pays OM&A based on a 14 day lag
   c) on average GRC is paid immediately, 0 day lag
7) 10 year GRC holiday starting upon COD
8) GRC property tax rate of 26.5% and GRC water rental rate of 9.5%
9) GRC cost based on $40/MWh escalating at 2% starting 2014
10) OM&A costs of $.11M (2005$M/year) escalated by CPI
11) Capital Tax Rate: 2005 .3%, 2006 .3%, 2007 .3%, 2008 .3%, 2009 .23%, 2010 .15%, 2011 .08%, disappears after 2011
12) Large Corporation Tax Rate: 2005 .18%, 2006 .13% 2007 .06%, disappears after 2007
13) Income Tax Rate (Federal and Provincial): 2005 34.12%, 2006 34.12%, 2007 31.0%, 2008 30.0%, 2009 28.5%, after 2009 27.0%
14) Annual Energy Production based on Niagara River flows from 1926 to 2002 to determine diversion flows
15) in 2017 a scheduled outage on Niagara's canal is expected to occur resulting in increased energy produciton for the tunnel
16) LUEC escalates at CPI
17) PPA - 20% of PPA escalates at CPI
18) Total NPV of costs equals total NPV of LUEC revenues over 90 year life
19) Total NPV of costs equals total NPV of PPA revenues over 90 year life

LUEC

Year				2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy Production	(TWh)		(a)	-	-	-	-	-	-	-	-	-	1.6	1.6	1.6	2.7	1.6	1.6
Yearly Escalation (CPI)	(%)			1.80%	1.60%	1.80%	1.90%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Escalation Rate from 2009								1.000	1.020	1.040	1.061	1.082	1.104	1.126	1.149	1.172	1.195	1.219
LUEC Rate (escalated)	(¢/kWh)	6.8	(b)					6.8	6.9	7.1	7.2	7.4	7.5	7.7	7.8	8.0	8.1	8.3
Yearly Revenue	($M)		(c) = (a)*(b)					0.0	0.0	0.0	0.0	0.0	117.2	119.5	121.9	212.1	126.9	129.4
Discount Rate	(%)			7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor			(d)	1.000	0.935	0.874	0.816	0.763	0.713	0.666	0.623	0.582	0.544	0.508	0.475	0.444	0.415	0.388
(1 - combined income tax rate)			(e)	65.9%	65.9%	69.0%	70.0%	71.5%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)			(f) = (c) * (d) * (e)	1009.8									46.5	44.4	42.3	68.7	38.4	36.6

PPA

Year					2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy Production	(TWh)			(a)	-	-	-	-	-	-	-	-	-	1.6	1.6	1.6	2.7	1.6	1.6
Yearly Escalation (CPI)	(%)				1.80%	1.60%	1.80%	1.90%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
PPA Rate (escalated)	(¢/kWh)	9.6	20%											1.9	2.0	2.0	2.0	2.1	2.1
	(¢/kWh)		80%											7.7	7.7	7.7	7.7	7.7	7.7
	(¢/kWh)			(b)										9.6	9.6	9.7	9.7	9.8	9.8
Yearly Revenue	($M)			(c) = (a)*(b)										149.7	150.3	150.9	258.3	152.1	152.8
Discount Rate	(%)				7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor				(d)	1.000	0.935	0.874	0.816	0.763	0.713	0.666	0.623	0.582	0.544	0.508	0.475	0.444	0.415	0.388
(1 - combined income tax rate)				(e)	65.9%	65.9%	69.0%	70.0%	71.5%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)				(f) = (c) * (d) * (e)	1009.8									59.4	55.8	52.3	83.7	46.1	43.2

Costs - Present Value

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Attachemnt 2

Capital Costs	($M)
Operating Costs	
GRC	($M)
OM&A	($M)
Capital Tax	($M)
Large Corporation Tax	($M)
NPV - Total (2005$)	($M)

Assumptions:
1) PV date July 1, 2005
2) Operating cash flows assumed to occur in June of each year
3) Discount Rate 7%
4) Total Project cost of $1.6B (includes $286.6M of Interest During Constru
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17) PPA - 20% of PPA escalates at CPI
18) Total NPV of costs equals total NPV of LUEC revenues over 90 year life
19) Total NPV of costs equals total NPV of PPA revenues over 90 year life

LUEC

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Escalation Rate from 2009		1.243	1.268	1.294	1.319	1.346	1.373	1.400	1.428	1.457	1.486	1.516	1.546	1.577	1.608	1.641	1.673	1.707	1.741	1.776	1.811	1.848
LUEC Rate (escalated)	(¢/kWh)	8.5	8.6	8.8	9.0	9.2	9.3	9.5	9.7	9.9	10.1	10.3	10.5	10.7	10.9	11.2	11.4	11.6	11.8	12.1	12.3	12.6
Yearly Revenue	($M)	132.0	134.6	137.3	140.1	142.9	145.7	148.6	151.6	154.6	157.7	160.9	164.1	167.4	170.7	174.2	177.6	181.2	184.8	188.5	192.3	196.1
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.362	0.339	0.316	0.296	0.276	0.258	0.241	0.226	0.211	0.197	0.184	0.172	0.161	0.150	0.140	0.131	0.123	0.115	0.107	0.100	0.094
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		34.9	33.3	31.7	30.2	28.8	27.5	26.2	25.0	23.8	22.7	21.6	20.6	19.6	18.7	17.9	17.0	16.2	15.5	14.7	14.0	13.4

PPA

Year		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
PPA Rate (escalated)	(¢/kWh)	2.2	2.2	2.2	2.3	2.3	2.4	2.4	2.5	2.5	2.6	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.0	3.1	3.1	3.2
	(¢/kWh)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	(¢/kWh)	9.8	9.9	9.9	10.0	10.0	10.1	10.1	10.2	10.2	10.3	10.3	10.4	10.4	10.5	10.5	10.6	10.6	10.7	10.8	10.8	10.9
Yearly Revenue	($M)	153.5	154.1	154.8	155.5	156.2	157.0	157.7	158.5	159.2	160.0	160.8	161.7	162.5	163.4	164.2	165.1	166.0	166.9	167.9	168.9	169.8
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.362	0.339	0.316	0.296	0.276	0.258	0.241	0.226	0.211	0.197	0.184	0.172	0.161	0.150	0.140	0.131	0.123	0.115	0.107	0.100	0.094
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		40.6	38.1	35.8	33.6	31.5	29.6	27.8	26.1	24.5	23.0	21.6	20.3	19.1	17.9	16.8	15.8	14.9	14.0	13.1	12.3	11.6

Costs - Present Value

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Attachemnt 2

Capital Costs	($M)
Operating Costs	
GRC	($M)
OM&A	($M)
Capital Tax	($M)
Large Corporation Tax	($M)
NPV - Total (2005$)	($M)

Assumptions:
1) PV date July 1, 2005
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3) Discount Rate 7%
4) Total Project cost of $1.6B (includes $286.6M of Interest During Constru
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LUEC

Year		2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Escalation Rate from 2009		1.885	1.922	1.961	2.000	2.040	2.081	2.122	2.165	2.208	2.252	2.297	2.343	2.390	2.438	2.487	2.536	2.587	2.639	2.692	2.745	2.800
LUEC Rate (escalated)	(¢/kWh)	12.8	13.1	13.3	13.6	13.9	14.2	14.4	14.7	15.0	15.3	15.6	15.9	16.3	16.6	16.9	17.3	17.6	18.0	18.3	18.7	19.1
Yearly Revenue	($M)	200.1	204.1	208.1	212.3	216.5	220.9	225.3	229.8	234.4	239.1	243.9	248.7	253.7	258.8	264.0	269.2	274.6	280.1	285.7	291.4	297.3
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.087	0.082	0.076	0.071	0.067	0.062	0.058	0.054	0.051	0.048	0.044	0.042	0.039	0.036	0.034	0.032	0.030	0.028	0.026	0.024	0.023
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		12.8	12.2	11.6	11.1	10.5	10.0	9.6	9.1	8.7	8.3	7.9	7.5	7.2	6.8	6.5	6.2	5.9	5.7	5.4	5.1	4.9

PPA

Year		2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
PPA Rate (escalated)	(¢/kWh)	3.3	3.3	3.4	3.5	3.5	3.6	3.7	3.8	3.8	3.9	4.0	4.1	4.2	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9
	(¢/kWh)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	(¢/kWh)	11.0	11.0	11.1	11.2	11.2	11.3	11.4	11.4	11.5	11.6	11.7	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.4	12.5
Yearly Revenue	($M)	170.8	171.9	172.9	174.0	175.1	176.2	177.3	178.4	179.6	180.8	182.0	183.3	184.5	185.8	187.2	188.5	189.9	191.3	192.7	194.2	195.7
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.087	0.082	0.076	0.071	0.067	0.062	0.058	0.054	0.051	0.048	0.044	0.042	0.039	0.036	0.034	0.032	0.030	0.028	0.026	0.024	0.023
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		10.9	10.2	9.6	9.1	8.5	8.0	7.5	7.1	6.7	6.3	5.9	5.6	5.2	4.9	4.6	4.4	4.1	3.9	3.6	3.4	3.2

Costs - Present Value

Capital Costs	($M)
Operating Costs	
GRC	($M)
OM&A	($M)
Capital Tax	($M)
Large Corporation Tax	($M)
NPV - Total (2005$)	($M)

Assumptions:
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LUEC

		2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082
Year		2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Escalation Rate from 2009		2.856	2.913	2.972	3.031	3.092	3.154	3.217	3.281	3.347	3.414	3.482	3.551	3.623	3.695	3.769	3.844	3.921	4.000	4.080	4.161	4.244
LUEC Rate (escalated)	(¢/kWh)	19.4	19.8	20.2	20.6	21.0	21.5	21.9	22.3	22.8	23.2	23.7	24.2	24.7	25.1	25.6	26.2	26.7	27.2	27.8	28.3	28.9
Yearly Revenue	($M)	303.2	309.3	315.5	321.8	328.2	334.8	341.5	348.3	355.3	362.4	369.6	377.0	384.5	392.2	400.1	408.1	416.2	424.6	433.1	441.7	450.6
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.021	0.020	0.018	0.017	0.016	0.015	0.014	0.013	0.012	0.011	0.011	0.010	0.009	0.009	0.008	0.008	0.007	0.007	0.006	0.006	0.005
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		4.7	4.5	4.2	4.0	3.9	3.7	3.5	3.3	3.2	3.0	2.9	2.8	2.6	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.8

PPA

		2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082
Year		2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
PPA Rate (escalated)	(¢/kWh)	5.0	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.1	6.2	6.3	6.4	6.6	6.7	6.8	7.0	7.1	7.2	7.4
	(¢/kWh)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	(¢/kWh)	12.6	12.7	12.8	12.9	13.0	13.2	13.3	13.4	13.5	13.6	13.7	13.8	14.0	14.1	14.2	14.4	14.5	14.6	14.8	14.9	15.1
Yearly Revenue	($M)	197.2	198.7	200.3	201.9	203.6	205.2	207.0	208.7	210.5	212.3	214.1	216.0	218.0	219.9	221.9	224.0	226.1	228.2	230.4	232.6	234.8
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.021	0.020	0.018	0.017	0.016	0.015	0.014	0.013	0.012	0.011	0.011	0.010	0.009	0.009	0.008	0.008	0.007	0.007	0.006	0.006	0.005
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		3.0	2.9	2.7	2.5	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	1.0	0.9

Costs - Present Value

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Capital Costs	($M)
Operating Costs	
GRC	($M)
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Capital Tax	($M)
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NPV - Total (2005$)	($M)

Assumptions:
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LUEC

Year		2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Cumulative Escalation Rate from 2009		4.329	4.416	4.504	4.594	4.686	4.780	4.875	4.973	5.072	5.174	5.277	5.383	5.491	5.600	5.712	5.827	5.943	6.062	6.183	6.307	6.433
LUEC Rate (escalated)	(¢/kWh)	29.5	30.0	30.6	31.3	31.9	32.5	33.2	33.8	34.5	35.2	35.9	36.6	37.4	38.1	38.9	39.6	40.4	41.3	42.1	42.9	43.8
Yearly Revenue	($M)	459.6	468.8	478.1	487.7	497.4	507.4	517.5	527.9	538.5	549.2	560.2	571.4	582.8	594.5	606.4	618.5	630.9	643.5	656.4	669.5	682.9
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		1.7	1.6	1.6	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.7

PPA

Year		2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103
Energy Production	(TWh)	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
Yearly Escalation (CPI)	(%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
PPA Rate (escalated)	(¢/kWh)	7.5	7.7	7.8	8.0	8.1	8.3	8.5	8.6	8.8	9.0	9.2	9.4	9.5	9.7	9.9	10.1	10.3	10.5	10.7	11.0	11.2
	(¢/kWh)	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
	(¢/kWh)	15.2	15.4	15.5	15.7	15.8	16.0	16.1	16.3	16.5	16.7	16.8	17.0	17.2	17.4	17.6	17.8	18.0	18.2	18.4	18.6	18.9
Yearly Revenue	($M)	237.1	239.5	241.9	244.3	246.8	249.3	251.9	254.6	257.3	260.0	262.8	265.7	268.6	271.6	274.6	277.7	280.9	284.1	287.4	290.7	294.2
Discount Rate	(%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Annual Discount Factor		0.005	0.005	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001
(1 - combined income tax rate)		73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%	73.0%
NPV - LUEC Revenue (sum all years)		0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3

SEC Interrogatory #045

Ref: Ex. D1-T1-S2, Attachment 2 - DeCew Falls

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) P. 3. Please advise whether the option of sale of the facility was considered, and if not what barriers made that option impossible.

b) P. 4. Please confirm that G7 came in service in July 2010. Please confirm that G8 is on schedule to be in service in August 2010.

Response

a) The sale of DeCew Falls I Generating Station was not considered because it would be inconsistent with the Shareholder Agreement and good business practice. The Shareholder Agreement states: "OPG will seek to expand, develop and/or improve its hydroelectric capacity." Further, the Life Cycle Plan completed in 2009 indicates the station is economic, and its operation is integrated with the DeCew Falls II Generating Station.

b) The construction for Units G7 and G8 penstocks is expected to be completed by the end of 2010. Units G7 and G8 in-services dates will be in early 2011. As described below, the delayed in-service is due to the timing of the contract award, and unforeseen design and construction problems. However, OPG expects that the project contingency is sufficient to complete this project within the approved release amount of $10.5M.

   The original schedule targeted a contract award date of September 30, 2009. The Business Case Summary was approved on October 19, 2009 and final contract award did not occur until November 24, 2009.

   Discovery work during construction, due to unforeseen site conditions for the upper, middle, and powerhouse thrust blocks, resulted in additional design and construction costs. To insure the stability of the penstocks, the thrust blocks needed to be redesigned to make them larger. The additional time to re-engineer, excavate and construct the thrust blocks resulted in additional costs and an extension to the project schedule.

SEC Interrogatory #046

Ref: Ex. D1-T1-S2, Attachment 3 (Saunders)

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

(a) P. 3. Please confirm that this project achieves a security benefit, but no financial benefit or future cost savings.

(b) P. 3. Please advise the total cost of the generator controls. Please advise whether there are any financial benefits or future cost savings associated with that part of the project. Please advise whether there was a separate business case summary for that part of the project, and if so provide that summary.

(c) P. 4. Please confirm that a similar project has been or will be undertaken on the New York side of the power complex. If that is not the case, please advise the reasons why the need for this work would be different in New York than in Ontario.

(d) P. 5. Please confirm that the project was completed in January 2010.

Response

a) This project does achieve a security benefit – implementing the "air gap" solution was necessary to satisfy the North American Electric Reliability Corporation's Critical Infrastructure Protection requirements by the end of 2009. However, the primary objectives for this project were to replace the generator and transformer protections and controls to sustain reliable generation. The investment was required to bring the generator and transformer protections and controls up to current standards. Protecting this valuable asset and ensuring the station continues to operate reliably will provide financial benefits well into the future.

b) The cost of the generator controls is estimated to be approximately $7M based on the quotes that were obtained from suppliers during the developmental phase release. Protecting the assets will avoid equipment damage and the associated repair costs and lost generation opportunities. A separate business case for the controls was not prepared.

c) New York Power Authority's investment strategy is commercially sensitive information that OPG is not privy to.

d) This project is scheduled for completion in 2012. It remains on schedule and on budget.

SEC Interrogatory #047
(NON-CONFIDENTIAL VERSION)

Ref: Ex. D1-T1-S2, Attachment 4 (Sir Adam Beck I Generating Station Unit G9 Rehabilitation)

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) P. 2. Please confirm that the increase in capacity of 10 MW and the increase in energy of 60.8 Gwh implies a capacity factor of 70% for the additional capacity. Please disaggregate the energy into incremental energy from the existing capacity level, and incremental energy as a result of the additional MW, and show the capacity factor of the additional 10 MW of peaking resource.

b) P. 6. Please provide the full financial evaluation.

Response

a) No, a 70 per cent capacity factor is not implied for an incremental increase in capacity of 10 MW and incremental energy of 60.8 GWh. To clarify, the 10 MW increase is relative to the existing, end-of-life 50.8 MW generating unit, and the energy production is relative to operating the Sir Adam Beck Generating Station complex without unit G9. The incremental costs associated with installing an upgraded unit rated at 61.6 MW vs. installing a like-for-like 50.8 MW unit were small. Therefore, a financial evaluation was not completed and the incremental energy production and related capacity factors were not estimated for the 50.8 MW unit option.

b) The financial evaluation is attached as Attachment 1 with the commercially sensitive System Economic Values redacted.

	A	B	C	D	E	F	G
1	**Plant ID**	SAB1 G9 Rehabilitation (Incremental)					
2	**Asset Designation**		0	1 for regulated, 0 non-regulated asset			
3	**Price Cap for Regulated Asset**		NA	Insert Price if not $37.9/MWh			
4	**I/S Date**		2011				
5	**Assumed Life/Study Peiod**		50 yrs				
6	**Peaking Capacity / MCR**		10	61.6			
7	**Annual Generation**		61 GWh			For determination of the property tax rate	
8		(Existing Generation)				Rate Block	GWh Block
9	**Water Rental**		9.50%			2.5%	<50
10	**Property Tax**		26.50%			4.5%	50 - 400
11	**GRC Tax Holiday**		0 yrs			6.0%	400-700
12	**WACC**		7.0%			26.5%	700+
13	**Corp. Tax Rate**		27.00%				
14							
15							2007
16							
18	**System Economic Values (2008$)**		1	1 for Base, 2 Low and 3 High			
19			1	1 to include capacity credit; 0 to exclude			
20	Cost/Price of Power ($/MW)						
21	Winter Peak Energy Price($/MWh)						
22	Winter Off-Peak Energy Price($/MWh)						
23	Summer Peak Energy Price($/MWh)						
24	Summer Off-Peak Energy Price($/MWh)						
25							
28	**Revenue**						
29	Capacity (MW)					10	
30	Annual Energy (GWh)				100%	61	
31	Winter Peak Energy (GWh)			39.456	65%		
32	Winter Off-Peak Energy (GWh)			1.072	2%		
33	Summer Peak Energy (GWh)			15.923	26%		
34	Summer Off-Peak Energy (GWh)			4.394	7%		
35							
36	Revenue from Generation (in 2008$)						
37	Revenue from Generation (esc. k$)						
38	Other Revenue AGC + reactive support & voltage control						
39	**Total Revenue (Esc k$)**						
40							
41	**Capital Costs (see CCA descriptions below)**						
42	Capital Additions (Esc k$) CCA Class 1 (4%)						
43	Capital Additions (Esc k$) CCA Class 1** (6%)						
44	Capital Additions (Esc k$) CCA Class 17 (8%)						
45	Capital Additions (Esc k$) CCA Class 43.1 (30%)						
46	Capital Additions (Esc k$) CCA Class 8 (20%)						
47	**Total Capital Costs For Year (esc. K$) (no interest)**						
48							
49	**Operating & Other Costs (esc k$)**						
50	Water Rental (40 $/MWh price assumed thru 2012)						
51	OM&A						
52	- Base (property taxes not included)						
53	- Non-Standard						
54	- GRC Property Tax/Graduated Component (40 $/MWh price assumed thru 2012)						
55	- Other Costs						
56	**Tot. Operating & Other Costs**						
57	**Net Income Before Taxes(Taxable Income)**						
58	Income Taxes						
59	Add: Tax Shield From CCA						
60	**Net Income after All Taxes**						
61							
62	**Annual Cash Flow**						
63	**NPV of Cash Flow**					17,617	
64	Cumulative NPV of Cash Flows			checking...		17615	
65	PV Energy (GWh)					720	
66	PV Of All Costs (2008$k)					47233	
67	**LUEC (2008$/MWh)**					66	as compared to avg. price of
68	**IRR**					11.0%	
69	**Payback Period**					16 yrs	
72							
73	**Financial Factors**						
74	**Federal&Provincial Tax Rate For Generator Of Electricity**						
75	**PV Factor**						
76	CPI, %change						
77	**CPI Index**						
78	GDP Deflator, %change						
79	**GDP Index**						
80	OM&A Escalator, %change						
81	**OM&A Index**						
82	Capital Escalator, % change						
83	**Capital Index**						
84							
85							
86	**CCA Calculation**						
87							
88	**Opening Balance - UCC**						
89	Class 1 - Generating Equip-Bldgs & Other Structures						
90	Class 1** - New non-residential buildings						
91	Class 17 - Generating Equp acquired after Feb. 2000						
92	Class 43.1 - Small Hydro Electric						
93	Class 8 - Miscellaneous Equipment						
94							
95	**In-service additions**						
96	Class 1 - Generating Equip-Bldgs & Other Structures						
97	Class 1** - New non-residential buildings						
98	Class 17 - Generating Equp acquired after Feb. 2000						
99	Class 43.1 - Small Hydro Electric						
100	Class 8 - Miscellaneous Equipment						
101							
102	**CCA calculation:**						
103	Class 1 - Generating Equip-Bldgs & Other Structures			4%			
104	Class 1** - New non-residential buildings			6%			
105	Class 17 - Generating Equp acquired after Feb. 2000			8%			
106	Class 43.1 - Small Hydro Electric			30%			
107	Class 8 - Miscellaneous Equipment			20%			
108							
109	**Ending balance:**						
110	Class 1 - Generating Equip-Bldgs & Other Structures						
111	Class 1** - New non-residential buildings						
112	Class 17 - Generating Equp acquired after Feb. 2000						
113	Class 43.1 - Small Hydro Electric						
114	Class 8 - Miscellaneous Equipment						
115							
116	**Tax Shield (tax rate) x CCA**						

	H	I	J	K	L	M	N	O	P	Q	R	S	T
8	Cumulative	Extg + Inc	Existing GW	Inc GWh									
9	50	50	0	50									
10	400	11	0	11									
11	700	0	0	0									
12	700+	0	0	0									
15	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
16	1	2	3	4	5	6	7	8	9	10	11	12	13
20–24	[redacted]												
29	0	0	0	10	10	10	10	10	10	10	10	10	10
30	0	0	0	61	61	61	61	61	61	61	61	61	61
31	0	0	0	39	39	39	39	39	39	39	39	39	39
32	0	0	0	1	1	1	1	1	1	1	1	1	1
33	0	0	0	16	16	16	16	16	16	16	16	16	16
34	0	0	0	4	4	4	4	4	4	4	4	4	4
36	0	0	0	3,938	3,957	4,007	4,497	5,027	5,566	5,719	5,821	5,821	5,769
37	0	0	0	4,125	4,198	4,315	4,920	5,598	6,313	6,610	6,857	6,990	7,064
39	0	0	0	4,125	4,198	4,315	4,920	5,598	6,313	6,610	6,857	6,990	7,064
44	1,975	14,980	13,013										
47	1,975	14,980	13,013	0	0	0	0	0	0	0	0	0	0
50	0	0	0	231	231	231	467	532	600	628	651	664	671
52	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	645	645	645	1,304	1,483	1,673	1,752	1,817	1,852	1,872
55	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	876	876	876	1,771	2,015	2,273	2,380	2,469	2,516	2,543
57	0	0	0	3,249	3,322	3,438	3,149	3,582	4,040	4,231	4,388	4,474	4,521
58	0	0	0	926	897	928	850	967	1,091	1,142	1,185	1,208	1,221
59	25	233	543	623	543	500	460	423	389	358	329	303	279
60	25	233	543	2,946	2,968	3,010	2,758	3,038	3,338	3,446	3,533	3,569	3,579
62	-1,950	-14,747	-12,470	2,946	2,968	3,010	2,758	3,038	3,338	3,446	3,533	3,569	3,579
63	-1,950	-13,782	-10,892	2,405	2,265	2,146	1,838	1,892	1,943	1,875	1,796	1,695	1,589
64	-1,950	-15,733	-26,624	-24,219	-21,955	-19,809	-17,971	-16,079	-14,136	-12,262	-10,466	-8,770	-7,181
67			$90 /MWh										
69	0	0	0	1	1	1	1	1	1	1	1	1	1
74	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
75	1.00	0.93	0.87	0.82	0.76	0.71	0.67	0.62	0.58	0.54	0.51	0.48	0.44
76	1.9%	2.2%	2.1%	2.1%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
77	1.00	1.02	1.04	1.06	1.09	1.11	1.13	1.15	1.18	1.20	1.22	1.25	1.27
78	2.0%	1.7%	1.6%	1.4%	1.3%	1.5%	1.6%	1.8%	1.9%	1.9%	1.9%	1.9%	2.0%
79	1.00	1.02	1.03	1.05	1.06	1.08	1.09	1.11	1.13	1.16	1.18	1.20	1.22
80	3.6%	4.3%	4.4%	3.9%	4.1%	4.5%	4.5%	4.4%	4.7%	5.1%	5.3%	5.4%	5.5%
81	1.00	1.04	1.09	1.13	1.18	1.23	1.28	1.34	1.40	1.48	1.55	1.64	1.73
82	-2.9%	0.7%	1.2%	1.2%	1.9%	2.0%	1.6%	1.4%	1.6%	1.4%	1.3%	1.6%	1.6%
83	1.00	1.01	1.02	1.03	1.05	1.07	1.09	1.10	1.12	1.14	1.15	1.17	1.19
89	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0
91	0	-1,896	-16,125	-27,328	-25,141	-23,130	-21,280	-19,577	-18,011	-16,570	-15,245	-14,025	-12,903
92	0	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	-1,896	-16,125	-27,328	-25,141	-23,130	-21,280	-19,577	-18,011	-16,570	-15,245	-14,025	-12,903
96	0	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0
98	-1,975	-14,980	-13,013	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0
101	-1,975	-14,980	-13,013	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0	0
105	-79	-751	-1,811	-2,186	-2,011	-1,850	-1,702	-1,566	-1,441	-1,326	-1,220	-1,122	-1,032
106	0	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0
108	-79	-751	-1,811	-2,186	-2,011	-1,850	-1,702	-1,566	-1,441	-1,326	-1,220	-1,122	-1,032
110	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0
112	-1,896	-16,125	-27,328	-25,141	-23,130	-21,280	-19,577	-18,011	-16,570	-15,245	-14,025	-12,903	-11,871
113	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0
115	-1,896	-16,125	-27,328	-25,141	-23,130	-21,280	-19,577	-18,011	-16,570	-15,245	-14,025	-12,903	-11,871
116	25	233	543	623	543	500	460	423	389	358	329	303	279

	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF
15	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
16	14	15	16	17	18	19	20	21	22	23	24	25
29	10	10	10	10	10	10	10	10	10	10	10	10
30	61	61	61	61	61	61	61	61	61	61	61	61
31	39	39	39	39	39	39	39	39	39	39	39	39
32	1	1	1	1	1	1	1	1	1	1	1	1
33	16	16	16	16	16	16	16	16	16	16	16	16
34	4	4	4	4	4	4	4	4	4	4	4	4
36	5,738	5,781	5,803	5,843	5,882	5,959	5,999	5,999	5,999	5,999	5,999	5,999
37	7,160	7,354	7,527	7,729	7,933	8,192	8,405	8,567	8,731	8,899	9,070	9,244
39	7,160	7,354	7,527	7,729	7,933	8,192	8,405	8,567	8,731	8,899	9,070	9,244
47	0	0	0	0	0	0	0	0	0	0	0	0
50	680	699	715	734	754	778	799	814	829	845	862	878
52	0	0	0	0	0	0	0	0	0	0	0	0
54	1,898	1,949	1,995	2,048	2,102	2,171	2,227	2,270	2,314	2,358	2,404	2,450
55	0	0	0	0	0	0	0	0	0	0	0	0
56	2,578	2,648	2,710	2,782	2,856	2,949	3,026	3,084	3,143	3,204	3,265	3,328
57	4,583	4,707	4,817	4,947	5,077	5,243	5,379	5,483	5,588	5,695	5,805	5,916
58	1,237	1,271	1,301	1,336	1,371	1,416	1,452	1,480	1,509	1,538	1,567	1,597
59	256	236	217	200	184	169	155	143	132	121	111	102
60	3,602	3,672	3,734	3,811	3,890	3,997	4,082	4,145	4,211	4,279	4,349	4,421
62	3,602	3,672	3,734	3,811	3,890	3,997	4,082	4,145	4,211	4,279	4,349	4,421
63	1,495	1,424	1,353	1,291	1,231	1,182	1,129	1,071	1,017	966	917	872
64	-5,687	-4,263	-2,909	-1,619	-387	795	1,924	2,995	4,012	4,978	5,896	6,767
69	1	1	1	1	1	0	0	0	0	0	0	0
74	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
75	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.23	0.21	0.20
76	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
77	1.30	1.32	1.35	1.38	1.40	1.43	1.46	1.49	1.52	1.55	1.58	1.61
78	1.9%	1.9%	2.0%	2.0%	2.0%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
79	1.25	1.27	1.30	1.32	1.35	1.37	1.40	1.43	1.46	1.48	1.51	1.54
80	5.4%	5.3%	5.3%	5.3%	5.3%	5.2%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
81	1.82	1.92	2.02	2.13	2.24	2.35	2.47	2.60	2.73	2.87	3.01	3.16
82	1.6%	1.7%	1.8%	1.9%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
83	1.21	1.23	1.25	1.27	1.30	1.32	1.34	1.37	1.39	1.42	1.44	1.47
89	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
91	-11,871	-10,921	-10,047	-9,244	-8,504	-7,824	-7,198	-6,622	-6,092	-5,605	-5,157	-4,744
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	-11,871	-10,921	-10,047	-9,244	-8,504	-7,824	-7,198	-6,622	-6,092	-5,605	-5,157	-4,744
96	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0	0	0
105	-950	-874	-804	-739	-680	-626	-576	-530	-487	-448	-413	-380
106	0	0	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0
108	-950	-874	-804	-739	-680	-626	-576	-530	-487	-448	-413	-380
110	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0
112	-10,921	-10,047	-9,244	-8,504	-7,824	-7,198	-6,622	-6,092	-5,605	-5,157	-4,744	-4,364
113	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0
115	-10,921	-10,047	-9,244	-8,504	-7,824	-7,198	-6,622	-6,092	-5,605	-5,157	-4,744	-4,364
116	256	236	217	200	184	169	155	143	132	121	111	102

	AG	AH	AI	AJ	AK	AL	AM	AN
15	2033	2034	2035	2036	2037	2038	2039	2040
16	26	27	28	29	30	31	32	33
29	10	10	10	10	10	10	10	10
30	61	61	61	61	61	61	61	61
31	39	39	39	39	39	39	39	39
32	1	1	1	1	1	1	1	1
33	16	16	16	0	16	16	16	16
34	4	4	4	0	4	4	4	4
36	5,999	5,999	5,999	4,331	5,999	5,999	5,999	5,999
37	9,422	9,603	9,788	7,202	10,167	10,363	10,562	10,765
39	9,422	9,603	9,788	7,202	10,167	10,363	10,562	10,765
47	0	0	0	0	0	0	0	0
50	895	912	930	684	966	984	1,003	1,023
52	0	0	0	0	0	0	0	0
53				16,290				
54	2,497	2,545	2,594	1,908	2,694	2,746	2,799	2,853
55	0	0	0	0	0	0	0	0
56	3,392	3,457	3,524	18,883	3,660	3,731	3,802	3,875
57	6,030	6,146	6,264	-11,681	6,507	6,632	6,759	6,889
58	1,628	1,659	1,691	-3,154	1,757	1,791	1,825	1,860
59	94	87	80	73	68	62	57	53
60	4,496	4,573	4,653	-8,454	4,818	4,904	4,992	5,082
62	4,496	4,573	4,653	-8,454	4,818	4,904	4,992	5,082
63	828	787	749	-1,271	677	644	613	583
64	7,596	8,383	9,132	7,860	8,538	9,182	9,795	10,378
69	0	0	0	0	0	0	0	0
74	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
75	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11
76	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
77	1.65	1.68	1.71	1.75	1.78	1.82	1.85	1.89
78	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%	1.9%
79	1.57	1.60	1.63	1.66	1.69	1.73	1.76	1.79
80	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
81	3.32	3.49	3.67	3.85	4.05	4.25	4.46	4.69
82	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%
83	1.50	1.52	1.55	1.58	1.61	1.64	1.67	1.70
89	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
91	-4,364	-4,015	-3,694	-3,399	-3,127	-2,877	-2,646	-2,435
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	-4,364	-4,015	-3,694	-3,399	-3,127	-2,877	-2,646	-2,435
96	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0
105	-349	-321	-296	-272	-250	-230	-212	-195
106	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0
108	-349	-321	-296	-272	-250	-230	-212	-195
110	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0
112	-4,015	-3,694	-3,399	-3,127	-2,877	-2,646	-2,435	-2,240
113	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0
115	-4,015	-3,694	-3,399	-3,127	-2,877	-2,646	-2,435	-2,240
116	94	87	80	73	68	62	57	53

SEC Interrogatory #048

Ref: Ex. F1-T1-S1, Attachment 1 - Hydroelectric Business Plan

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

a) P. 3. Please confirm that, based on current information, the Applicant has been underinvesting in the "re-investment" component of hydroelectric for the past 10 years. If this is the case, please estimate the amount of underinvestment, and estimate the amount of the spending going forward that can fairly be termed "catch-up" to get the hydroelectric reinvestment levels back to a proper amount.

b) P. 6. Please explain why hydroelectric OM&A and Operations Capital are both forecast to drop from 2011 to 2012.

c) P. 7. Please provide a copy of the business case and related cost/benefit analysis for the Niagara Bridge Divestiture Strategy.

d) P. 7. Please explain in detail the strategy to reduce the labour and payroll burden rates as indicated.

e) P. 9. Please provide a copy of the preliminary review of the expansion of the existing PGS reservoir. Please advise what work is being done on this project in 2011 and 2012.

f) P. 17. Please provide updated tables for Age Distribution and Retirement Eligibility.

g) P. 18. Please describe in detail the "over-hiring" strategy and estimate its cost implications.

h) P. 27. Please explain the 6% increase in Regular Staff from 2009 to 2010.

i) P. 27. Please explain the terminology "contribution margin" and describe how the figure is calculated.

j) P. 33. Please disaggregate the causes for the 1.8% EFOR forecast, and quantify the impact on revenue requirement of the difference between the 1.8% forecast and the 1.5% benchmark.

Response

a) No, the regulated hydroelectric facilities have received and continue to receive appropriate levels of reinvestment based on the Hydroelectric portfolio management system described on page 3 of Ex. F1-T1-S1.

b) The forecast totals for OM&A and Capital on page 6 of the Hydroelectric Business Plan presentation include unregulated facilities and are therefore not relevant to this rate application. Please refer to Ex. D1-T1-S1, Ex. F1-T2-S2, and Ex. F1-T3-S2 for year-over-year explanations of Capital, Base OM&A, and Project OM&A for the regulated stations.

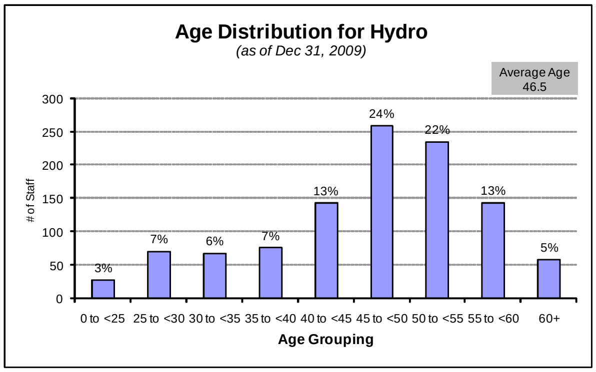
c) OPG does not have a single business case summary ("BCS") prepared for the overall bridge divestiture strategy. Individual BCSs are prepared for each bridge divestiture as each bridge has its own unique agreements, obligations, and asset condition. OPG has ongoing legal obligations related to roadway bridges in the Niagara Region. A strategy has been put in place to divest the bridges to the local municipalities in order to reduce the future costs, liabilities, and risks to OPG. The costs and benefits of this program are described in Ex. F1-T2-S1, page 2, lines 26-30, and in Ex. F1-T2-S2 on pages 2 and 3.

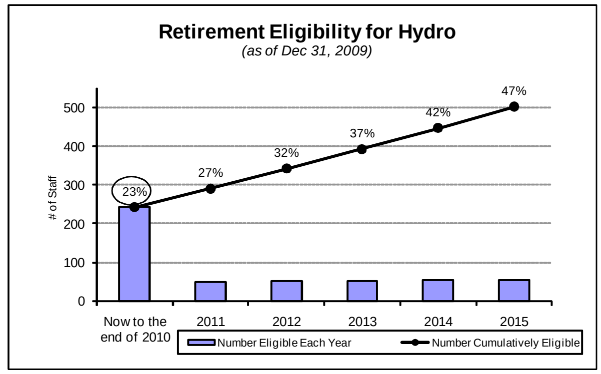
d) A description of labour burdens, along with the related pension and benefits discussion, can be found in sections 6 and 7 of Ex. F4-T3-S1 on Compensation, Wages and Benefits.

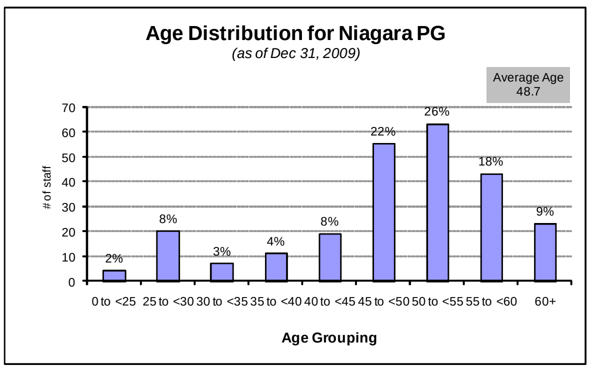
e) The preliminary review report summarizing the expansion options for the reservoir has not been finalized. A draft report has been received from the consultant, Hatch Energy, and is currently being reviewed by OPG's technical staff. The preliminary review report is expected to be completed by the end of 2010.

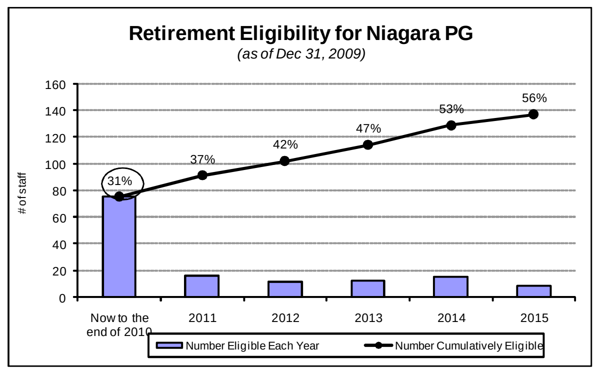
As described in the Board staff interrogatory in Ex. L-1-043, the preliminary review referenced in the Business Plan Presentation considered the following options: expanding the footprint of the reservoir, deepening the reservoir, and increasing the dyke elevation. While the reservoir volume increases under the individual options can be as high as 27 per cent, a combination of options could result in volume increases of over 40 per cent. The next steps include the preparation of cost estimates and geotechnical reviews of the options by third-party experts. If the expansion work proceeds, it will be aligned with the comprehensive remedial work on the present dyke.

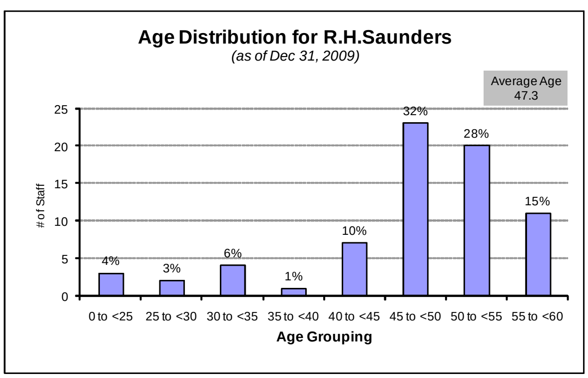
f) Updated Age Distribution and Retirement Eligibility graphs are below.

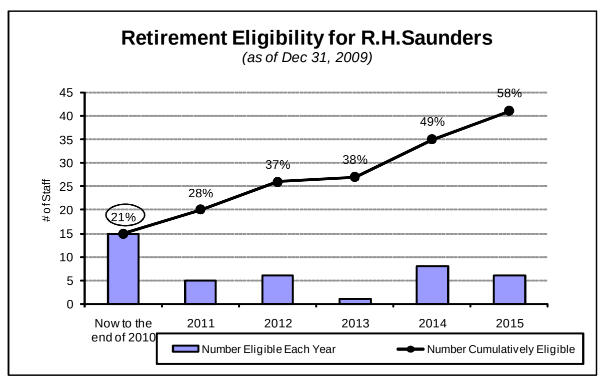












g) Please see responses to Board staff and Energy Probe interrogatories in Ex. L-1-041 and Ex. L-6-004 respectively for a description of the "over-hiring" strategy. In addition to changes in labour rates, staff counts are a significant contributor to the year-over-year changes in total labour costs observed in Ex. F1-T2-S1, Tables 1 and 2.

h) The regular staff Full Time Equivalents ("FTE") for 2009 and 2010 on page 27 of the Hydroelectric Business Plan presentation include unregulated facilities and are therefore not relevant to this rate application. However, the Hydroelectric business unit total FTEs do include the impact of the hiring strategy described in part g).

i) The contribution margins presented on page 27 of the Hydroelectric Business Plan presentation include unregulated facilities and are therefore not relevant to this rate application. However, contribution margin is defined as the total revenues minus all OM&A, Gross Revenue Charges, and other water rental payments. Taxes and other costs are excluded.

j) A discussion of reliability performance, including station level Equivalent Forced Outage Rate (”EFOR”) data, is included in Ex. F1-T1-S1, Section 3 and 4. By definition, the EFOR measure captures reliability-related forced outages, which are unplanned events. In general, at the low levels of EFOR experienced by OPG’s regulated hydroelectric facilities, forced outages do not have a material impact on revenue requirements because repairs are usually funded by existing Base OM&A budgets.

VECC Interrogatory #006

Ref: Ex. D1-T1-S1, page 5 and Table 2, Ex. D1-T1-S2, Attachment 1, page 1, and Ex. D1-T1-S2, page 3, lines 1-2

Issue Number: 4.2
Issue: Are the capital budgets and/or financial commitments for 2011 and 2012 for the regulated hydroelectric business appropriate and supported by business cases?

Interrogatory

With respect to the Niagara Tunnel Project, the pre-filed evidence states:

> *In June 2009, following the recommendations of the Dispute Review Board ("DRB"), OPG and the contractor signed an amended design-build contract with a revised target cost and schedule. The target cost and schedule took into account the difficult rock conditions encountered, restoration of the circular cross section in areas of rock overbreak, and the concurrent tunnel excavation and liner installation work required to expedite completion of the tunnel. OPG's Board of Directors approved a revised project cost estimate of $1.6B and a revised scheduled completion date of December 2013.*

The last reference above states:

> *The Niagara Tunnel project was originally approved by OPG's Board of Directors ("the OPG Board") in July 2005 at an estimated cost of $985M and a June 2010 in-service date.*

Please provide the annual capital spending originally planned for this project for each year until completion, i.e., the original estimated yearly capital expenditures before the Board of Directors approved the revised project estimate of $1.6B.

Response

Originally planned capital expenditures for this project from the Niagara Tunnel Project business case summary, dated July 28, 2005, were:

2004	$3.5M
2005	$69.2M
2006	$194.1M
2007	$215.5M
2008	$227.7M
2009	$208.9M
2010	$66.3M
Total	$985.2M