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14 September 2010

Ms. Kirsten Walli, Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th Floor
Toronto, ON
M4P 1E4

Dear Ms Walli:

Re: EB-2010-0008 – OPG Payments – Interrogatory Responses Filed by GEC

Attached please find the interrogatory responses in regard to issues 2.2 and 3.3, which are being filed by GEC in this matter.

Two hard copies will be delivered to the Board.

Sincerely,

David Poch

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GEC Response to OPG Interrogatory No. 001

Ref: Page 9 lines 2–4

Issue No.: 3.3

Issue:

Interrogatory

Does Mr. Chernick believe that electric utilities have no difficulty in financing nuclear projects? Please give examples and references to support your answer.

Response

No.

Mr. Chernick is aware that the risks of nuclear construction (cost overruns and schedule delays) led to financial stress on several US utilities in the 1980s, and to the bankruptcy of Public Service of New Hampshire. Information on those problems is widely available, if OPG is interested in gathering it.

Those nuclear risks support the concept of a higher required return for nuclear investment.

GEC Response to OPG Interrogatory No. 002

Ref: Page 15 lines 12-20

Issue No.: 3.3

Issue:

Interrogatory

Why does Mr. Chernick believe that non-baseload attributes of CCCT should be taken into account when evaluating baseload power generation options?

Response

The question does not define the term "non-baseload attributes of CCCT." Mr. Chernick believes that dispatchability, load following and other characteristics that might be considered "non-baseload attributes of CCCT" should be taken into account when comparing the benefits of a CCCT to those of a "baseload power generation option." If the baseload power generation option does not have those characteristics, the evaluation should reflect that difference.

GEC Response to OPG Interrogatory No. 003

Ref: Page 20 line 10

Issue: Issue 2.2

Issue:

Interrogatory

Please explain why recovering CWIP carrying costs in rates for a $6-to-$10-billion project over a span of 10 years would have no impact on the credit rating of OPG? How large a project would one need to have an impact?

Response

Mr. Chernick did not say that "recovering CWIP carrying costs in rates for a $6-to-$10-billion project over a span of 10 years would have no impact on the credit rating of OPG." The cited line is the end of a sentence that reads "Hence, allowing CWIP in rate base is neither necessary nor sufficient to produce a favorable opinion from a rating agency."

Note that the entire project cost (whether that is $6 billion, $10 billion, or something else) would not be in CWIP (whether return on CWIP is capitalized or expensed).

GEC Response to OPG Interrogatory No. 004

Ref: Page 22 Lines 1 to 22

Issue Number: 2.2

Issue:

Interrogatory

What is Mr. Chernick's understanding of "front-loading"? If OPG's proposed CWIP treatment is not approved, when would front loading likely occur?

Response

A revenue stream is said to be front-loaded if the average payment occurs earlier than some reference stream, which may be nominally levelized, real-levelized, or something else, depending on the context. Compared to a nominal levelization of the refurbishment costs on a dollars-per-kW-year basis, cost recovery without a CWIP return would be front-loaded in the first several years of refurbished plant operation, scheduled to start about 2019. Compared to real-levelized costs, the front-loading would be over a longer period. Mr. Chernick has not attempted to determine the exact period of the front-loading.

With OPG's proposed CWIP return, frontloading would start even earlier, in 2011.

GEC Response to Staff Interrogatory No. 001

Ref: Prefiled evidence of Mr. Paul Chernick, page 31

Issue Number: 3.3

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

Interrogatory

In the pre-filed evidence, Mr. Chernick states:

> *As Venkataraman & Cortright (2010, p. 3–4, notes to Table 1), observed in using a base 15% equity return for a nuclear plant, compared to 10% for a gas combined-cycle plant, "Nuclear is a higher-risk investment that requires correspondingly higher returns."[footnote 14 omitted] The same report notes (p. 4) "no company would likely finance a nuclear plant today without a loan guarantee." Neither statement is true of hydro-electric plants.*

a) *Please provide a copy of the article referenced in footnote 14: Venkataraman, Swami, and Richard Cortright, Jr. 2010 "The Economics of U.S. Nuclear Power: Natural Gas Prices and Loan Guarantees Are Key to Viability" Standard & Poor's Global Credit Portal Ratings Direct (August 16 2010).*

b) *Please provide support for Mr. Chernick's statement that the statements quoted from the Venkataraman & Cortright article do not apply to hydroelectric generation plants.*

Response

a. The article is Attachment 1.

b. Hydro plants are generally perceived to be a low-risk generation resource. Many hydro plants have been built, or are under construction or development by utilities, and even non-utility generators. (There is very little potential for new large hydro development in the US, but small hydro continues to be developed.) The following examples illustrate of the willingness of utilities and developers to build new hydro without loan guarantees.

- In Ontario, the OPA has 1,635 MW of hydro in operation and 691 MW in development from direct negotiations and the renewable energy standard offer program, with additional applications pending under the feed-in tariff.

  http://www.powerauthority.on.ca/Storage/123/17071_Revised_Q2_2010_Quarterly_Report.pdf

- In British Columbia, over 60 hydro plants have recently been completed or are under development by independent producers, under fixed-cost contracts without loan guarantees.

  http://www.hydroworld.com/index/display/article-display/0019632417/articles/hrhrw/hydroindustrynews/newdevelopment/2010/07/largest-independent.html

  http://www.bchydro.com/planning_regulatory/acquiring_power/clean_power_call/selected_proposals.html

  http://www.bchydro.com/planning_regulatory/acquiring_power/standing_offer_program/current_applications.html

  http://www.bchydro.com/planning_regulatory/acquiring_power/open_call_for_power/cft_results.html

The most recent Energy Information Administration compilation of projected additions of hydro facilities in the US is from filings in 2008 (prior to Federal loan guarantees) for 2009–2013. Total additions are tabulated at:

http://www.eia.doe.gov/cneaf/electricity/epa/epat1p4.html

The specific units are listed in Attachment 2, from http://www.eia.gov/pub/electricity/f860y08.zip

Owner	Plant	State	Unit	Status	Nameplate	EIA-Estimated Capability		ISD
						Summer	Winter	
Erie Boulevard Hydropower LP	Sherman Island	NY	6	V	1.3	1.2	1.2	2/1/2009
Erie Boulevard Hydropower LP	Sherman Island	NY	1	U	7	6.7	6.4	4/1/2009
Lower Valley Energy Inc	Swift Creek	WY	3	V	0.8	0.8	0.7	4/1/2009
Alaska Electric Light&Power Co	Lake Dorothy	AK	1	V	14.3	13.6	13.2	9/1/2009
City of Rock Island	Sears	IL	3	L	0.3	0.3	0.3	9/1/2009
City of Rock Island	Sears	IL	4	L	0.3	0.3	0.3	9/1/2009
Lower Valley Energy Inc	Swift Creek	WY	4	P	0.6	0.6	0.6	12/1/2009
Boise-Kuna Irrigation District	Arrowrock	ID	1	U	7.5	7.1	6.9	1/1/2010
Boise-Kuna Irrigation District	Arrowrock	ID	2	U	7.5	7.1	6.9	1/1/2010
Lower Valley Energy Inc	Swift Creek	WY	5	P	0.3	0.3	0.3	8/1/2010
Fall River Rural Elec Coop Inc	Chester Diversion	ID	1	T	1.2	1.1	1.1	10/1/2010
Fall River Rural Elec Coop Inc	Chester Diversion	ID	2	T	1.2	1.1	1.1	10/1/2010
Fall River Rural Elec Coop Inc	Chester Diversion	ID	3	T	1.2	1.1	1.1	10/1/2010
City of Aspen	Castle Creek	CO	1	P	1	1	0.9	11/1/2010
PPL Holtwood LLC	PPL Holtwood	PA	11	P	1.4	1.3	1.3	11/1/2010
PPL Holtwood LLC	PPL Holtwood	PA	13	P	1.4	1.3	1.3	11/1/2010
Pacific Gas & Electric Co	Britton	CA	1	L	2.8	2.7	2.6	12/1/2010
Los Alamos County	Abiquiu Dam	NM	3	P	3	2.9	2.8	3/1/2011
City of Holyoke Gas and Electric Dept.	Riverside	MA	6	P	2.7	2.2	2.1	12/1/2011
PPL Montana LLC	Rainbow	MT	9	L	70	66.5	64.4	5/1/2012
City of Hamilton	Meldahl	KY	1	P	35	33.3	32.2	1/1/2013
City of Hamilton	Meldahl	KY	2	P	35	33.3	32.2	1/1/2013
City of Hamilton	Meldahl	KY	3	P	35	33.3	32.2	1/1/2013
PPL Holtwood LLC	PPL Holtwood	PA	18	P	66	62.7	60.7	4/1/2013
PPL Holtwood LLC	PPL Holtwood	PA	19	P	66	62.7	60.7	4/1/2013
Erie Boulevard Hydropower LP	Stewarts Bridge	NY	2	P	2.5	2.4	2.3	12/1/2013
Pacific Gas & Electric Co	Chalk Mountain	CA	1	L	2.2	2.1	2	12/1/2013
Pacific Gas & Electric Co	Rock Creek Dam	CA	1	L	3.6	3.4	3.3	12/1/2013

Status Codes

P	Planned for installation but regulatory approvals not initiated; not under construction
L	Regulatory approvals pending; not under construction but site preparation could be underway
T	Regulatory approvals received; but not under construction but site preparation could be underway
U	Under construction, less than or equal to 50 percent complete (based on construction time to date of operation)
V	Under construction, more than 50 percent complete (based on construction time to date of operation)

GEC Response to Staff Interrogatory No. 002

Ref: Prefiled evidence of Mr. Paul Chernick, Exhibit PLC-2, page 13

Issue Number: 3.3

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

Interrogatory

Exhibit PLC-2 is a copy of the prefiled evidence of Mr. Paul Chernick in the first OPG payment amounts proceeding, considered under Board File No. EB-2007-0905. On page 13, Mr. Chernick states:

> *There are at least two benefits of separate costs of capital for OPG's two lines of business. First, if the OEB establishes separate costs of capital and the mix of OPG's investment changes, due to nuclear retrofits or refurbishment or new nuclear or hydro capacity, OPG's average allowed return would automatically shift in the direction of the investment mix. The return would only need to be updated for changes in market rates or the underlying risk in either OPG business segment.*

In the Board's Decision with Reasons in EB-2007-0905, the Board established a deemed capital structure of 47% equity and 53% debt, after allowance for the unfunded nuclear liability was taken into account. The Board affirmed this guideline treatment for OPG's cost of capital in the Report of the Board on Cost of Capital for Ontario's Regulated Utilities (the "Cost of Capital Report"), issued December 11, 2009. OPG has stated that its proposed cost of capital in this current application is consistent with the Board's Decision in EB-2007-0905 and with the Cost of Capital Report.

a) *Please provide Mr. Chernick's views of whether the 47:53 deemed capital structure does appropriately factor, the return commensurate for any differential business risk for each of nuclear and regulated hydroelectric, weighted to reflect the proportionate rate base.*

b) *Please identify whether, in Mr. Chernick's opinion, there has been any change in the business risk for each of OPG's nuclear and regulated* *hydroelectric since the Board's decision in EB-2007-0905. If there have been changes in risk, please explain fully.*

c) In this proceeding and in the previous case considered under Board File No. EB-2007-0905, OPG has filed a Cost of Service application, in which the cost of capital for determining the revenue requirement to be recovered in the payment amounts is set in a traditional manner, with the Cost of Capital Report serving as general guidelines for determining the appropriate cost of capital. If the cost of capital is set in a traditional manner through review of a full Cost of Service proceeding, and where the appropriate weighting of nuclear and regulated hydroelectric generation can be considered as well as changes in the economy and market rates and in the relative risk of OPG's regulated business segments, what advantages, beyond differential costs of capital for making better informed business investment decisions in each segment, are there to establishing a separate cost of capital for each of nuclear and regulated hydroelectric?

d) If the Board were subsequently to establish an incentive regulation form for setting the payment amounts for OPG's regulated facilities, please explain how rate-setting under an IRM plan, such as a price cap, would automatically reflect a shift in the direction of the investment mix between nuclear and regulated hydroelectric.

Response

a. Mr. Chernick has not performed this analysis.

b. Mr. Chernick has not reviewed this issue.

c. "Making better-informed business investment decisions" is a major advantage to differentiated costs of capital. In addition, differentiated costs of capital would make the updating more straight-forward, as the weighting of nuclear and hydro costs of equity could be updated explicitly based on accounting data, and only the equity rates (or leverage) would need to be updated.

d. The effect of differentiated returns in an IRM framework would depend on how, if at all, the IRM would update rate base. If the IRM includes periodic updates of rate base, using different returns for nuclear and hydro investments would reflect the higher return needed to support nuclear additions.

GEC Response to Staff Interrogatory No. 003

Ref: ExhC3/Tab1/Sch1
Ref: Prefiled evidence of Mr. Paul Chernick, Exhibit PLC-2, page 13

Issue Number: 3.3

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

Interrogatory

In ExhC3/Tab1/Sch1, OPG has filed a report by Ms. McShane, commissioned by OPG in accordance with the Board's Decision with Reasons EB-2007-0905, entitled Technology-Specific Capital Structures: An Assessment. In her report, Ms. McShane states: The qualitative assessment of the relative business risks of the hydroelectric and nuclear operations supports the conclusion that the nuclear operations face materially higher business risks than the hydroelectric operations. However, given the constraints of the available market data and the lack of proxy companies that are comparable to each of the two technologies, none of the analyses conducted were able to provide any quantitative insight into reasonable differential capital structures for the two operations. Any specification of technology-specific capital structures would be largely a judgmental exercise and lack any degree of precision. Given the degree of judgment that would be required and the absence of robust parameters upon which to base that judgment, there is no compelling basis for the Board to adopt technology-specific capital structures.[1]

a) Please provide Mr. Chernick's views as to whether he agrees with Ms. McShane's conclusions on a paucity of data for setting robust technology-specific costs of capital for each of nuclear and hydroelectric. b) If Mr. Chernick concurs with Ms. McShane's

[1]Prefiled Evidence of Ms. Kathleen C. McShane, Foster Associates, Inc., Report to Ontario Power Generation: Technology-Specific Capital Structures: An Assessment, page 9.

conclusions, how would the Board establish differential costs of capital that are robust enough for rate-setting in this proceeding?

b) *If Mr. Chernick concurs with Ms. McShane's conclusions, how would the Board establish differential costs of capital that are robust enough for rate-setting in this proceeding?*

c) *If Mr. Chernick's disagrees with Ms. McShane's conclusion, please explain. In addition, please explain how the Board may set differential costs of capital for nuclear and regulated hydroelectric based on the record of this proceeding.*

Response

a. Mr. Chernick has not reviewed this issue.

b. See part (a). Setting return on equity requires judgment. Using whatever information is available to establish a judgmental return differential is better than ignoring the differential.

c. See part (a). Mr. Chernick has not formulated a specific recommended differential in this proceeding.

GEC Response to PWU Interrogatory No. 001

Ref (a): August 31, 2010. DIRECT TESTIMONY OF PAUL CHERNICK ON BEHALF OF THE GREEN ENERGY COALITION. Resource Insight, Inc., Page 20, Lines 1-10 of states:

> Utilities Mid-Year 2010 Update, July 14 2010) rates "regulatory conditions" across 47 U.S. states[6]. Of the seven jurisdictions that received the top ranking awarded ("more credit supportive"), only two (Georgia and South Carolina) are on Mr. Luciani's list of jurisdictions allowing CWIP in rate base (Exhibit D4-1-1, p. 4) and at least two jurisdictions (Alabama and California) prohibit CWIP. Of the 19 jurisdictions rated as "supportive," five are on Mr. Luciani's list, one other reports allowing CWIP, and seven never or rarely allow CWIP. One state on Mr. Luciani's list—Louisiana—is rated "less supportive." Hence, allowing CWIP in rate base is neither necessary nor sufficient to produce a favourable opinion from a rating agency.

[http://www2.standardandpoors.com/spf/pdf/events/CRTconJuly142010.pdf, accessed August 30 2010]

Ref (b): Footnote 6 in Reference (a) Page 20.
[http://www2.standardandpoors.com/spf/pdf/events/CRTconJuly142010.pdf, accessed August 30 2010]
http://www2.standardandpoors.com/spf/pdf/events/CRTconJuly142010.pdf
Regulated U.S. Electric Utilities Mid-Year 2010 Update Standard & Poor's, July 14, 2010. Page 11, Utility Regulation Conditions Across 50 U.S. States.

Ref (c): August 30, 2010. Update to Report on Methodologies for Setting Ontario Power Generation Payment Amounts. Prepared for Ontario Energy Board. Power Advisory LLC, Page 22, Paragraph 4 and Page 23, Paragraph 2 states:

Indiana: Indiana's utilities have alternative regulation plans in place. The plans include earnings sharing mechanisms and several variance accounting provisions to recover fuel and other costs. However, the recovery of fuel costs is subject to an earnings test specified by state statute. Utilities are also permitted to share in margins earned from off-system sales above a benchmark level. Sales of emissions allowances are also subject to a sharing mechanism. Variance accounting is used for certain Midwest ISO related expenses. Utilities are allowed to earn a return on CWIP for qualified environmental compliance investments and these investments are recoverable through a tariff rider. In at least one case, the Commission approved accelerated depreciation recovery for environmental compliance investments. They are also allowed to earn a return on certain demand-side management ("DSM") programs.

Wisconsin: Legislation provided the Commission with the ability to establish a separate rate of return for new generating facilities, including other financial parameters to remain in place over the life of the plant as part of a pre-approval process. The Commission has also approved a return on 50% of CWIP. Wisconsin's utilities have divested their ownership interests in nuclear plants. The Commission establishes benchmarks for electric fuel costs, with sharing above and below the benchmark between shareholders and customers. Recovery of electric fuel costs is subject to variance accounting although utilities can request deferral of the recovery or refund.

Issue Number: 2.2

Issue: Is OPG's proposal to include CWIP in rate base for the Darlington Refurbishment Project appropriate?

Interrogatories

1. *Are Indiana and Wisconsin among the seven jurisdictions that received the top ranking awarded ("more credit supportive") identified in Ref (b) above?*

2. *If the response to (1) is yes, is a revision required to Ref (a) and if so please provide the revision in response to this interrogatory.*

Response

1. Yes.

2. No. The referenced evidence discusses the jurisdictions on Mr. Luciani's list, not a report issued after GEC's evidence was written. The conclusion that "allowing CWIP in rate base is neither necessary nor sufficient to produce a favourable opinion from a rating agency" is not affected by Wisconsin's partial CWIP policy.

   With regard to Indiana, it is Mr. Chernick's experience that allowing a return on CWIP for environmental retrofits (e.g., scrubbers, SCR, cooling towers) is common, partially because legislators and regulators have been concerned that utilities would be reluctant to undertake environmental projects that do not directly relate to their primary task of providing reliable energy supply. In this regard, the policy in Indiana and many U.S. states is conceptually comparable to the Board's policy of allowing a return on CWIP for distributors' investments in facilities to interconnect renewable generators.

GEC Response to Energy Probe Interrogatory No. 001

Ref: Exhibit PLC-2, p. 4

Issue Number: 3.3:

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

Interrogatory

Ms. McShane discusses the relevance of the Capital Asset Pricing Model ("CAPM") to estimating the cost of equity at some length (Ex. C3-S1-T1, at p. 47+). Please indicate whether you agree or disagree with her assessment that in CAPM, non-diversifiable risk is captured through beta and that company-specific risks can be diversified away and therefore not reflected or compensated for in expected returns.

Response

That statement is generally consistent with Mr. Chernick's understanding of the theory of the CAPM. While Mr. Chernick has not reviewed this issue for this proceeding, it is his understanding that empirical research has indicated that diversifiable risk also affects required return, indicating that the CAPM is not complete. For example, CAPM does not reflect the costs of liquidity crises or bankruptcy that may result from diversifiable risks.

GEC Response to Energy Probe Interrogatory No. 002

Ref: Exhibit PLC-2, p. 5

Issue Number: 3.3:

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

Interrogatory

You refer to Ms. McShane's discussion of forced outages in nuclear in her evidence in EB-2007-0905. To the extent that these outages are due to equipment failures, would such failures be regarded as company-specific risks and diversifiable, and hence not reflected in expected returns in the CAPM framework?

Response

That statement is generally consistent with Mr. Chernick's understanding of the theory of the CAPM. The CAPM return would be computed from utility revenues, reflecting among other things outage rates that include the effects of unusually lengthy outages.

GEC Response to Energy Probe Interrogatory No. 003

Ref: Exhibit PLC-2, p. 10

Issue Number: 3.3:

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

Interrogatory

Recognizing that both regulated hydro and nuclear produce baseload power, does the dispatchability of hydro in response to changes in economic activity that affect the demand for electricity mean that its beta and hence its cost of equity are greater or less than the equity cost of nuclear, everything else equal?

Response

Mr. Chernick does not see the connection between dispatch and beta in this situation. Both nuclear and hydro energy are fully dispatched, to the extent they are available. Regulated hydro energy is more valuable to consumers per MWh than nuclear energy, due to its dispatchability. From OPG's perspective, so long as it is paid a regulated price per MWh, variation in energy availability imposes risk, but the pattern of hydro dispatch does not affect OPG revenue.

GEC Response to Energy Probe Interrogatory No. 004

Ref: Exhibit PLC-2, p. 10

Issue Number: 3.3:

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

Interrogatory

Having regard to the various risks of regulated hydro and nuclear identified in your testimony in EB-2007-0905, what other non-diversifiable risks may be viewed as suggesting that OPG's nuclear business is riskier than its regulated hydro?

Response

Mr. Chernick has not attempted to determine whether various nuclear risks are diversifiable. Whether diversifiable or not, nuclear risks are clearly seen by the investment community to be relevant to corporate risk.