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1	Board Staff Interrogatory #038				
2 3	Re	Ref: Ex. E2-T1-S2, Table 1c			
4 5 6 7	Issue Number: 5.2 Issue: Is the proposed nuclear production forecast appropriate?				
8 9	<u>Int</u>	errogatory			
10 11 12 13	Nu ge SB	clear generating plants are baseload suppliers, similar to the regulated hydroelectric neration plants. In the recent past, nuclear plants have been affected by SBG conditions. G has been factored into the hydroelectric production forecast in this application.			
13 14 15	a)	Why is SBG not expected to be a factor in the nuclear production forecast?			
15 16 17 18	b)	Are there significant cost implications if SBG is included in the nuclear forecast versus the hydroelectric forecast?			
19 20 21	<u>Re</u>	<u>sponse</u>			
21 22 23 24 25 26 27 28	a)	As indicated at Ex. E2-T1-S1, page 12, lines 20-24, surplus baseload generation ("SBG") is not expected on a forecast basis to affect production from the nuclear stations. Therefore, no SBG adjustment has been made to the nuclear production forecast. OPG was not subject to material reductions in nuclear generation due to SBG situations in 2008 or 2009 and is currently not anticipating a significant impact on its nuclear facilities during the test period.			
28 29 30 31 32	b)	As stated in part a) above, OPG's forecast of SBG is not sufficient to warrant significant maneuvering of the nuclear plants. A cost analysis based on other SBG scenarios has not been performed.			
33 34		For additional information on nuclear versus hydroelectric SBG considerations, please see Ex. L-1-036.			

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1		Board Staff Interrogatory #039			
2 3	Ref: Ex. E2-T1-S2, Table 1c				
4 5 6 7	 Issue Number: 5.2 Issue: Is the proposed nuclear production forecast appropriate? 				
8 9	<u>Int</u>	errogatory			
10 11 12 13	Th 20 an	e history of actual Forced Loss Rate (FLR) day equivalents compared to planned in the 07-09 period is a consistent underestimate of the impact on the Pickering A and B facilities d an overestimate on the Darlington plant.			
13 14 15 16	a)	FLR averaged 219 days over 2007-09 for Pickering A and189 days for Pickering B. Why does OPG expect these rates to fall to an average of 42 days (-81%) for Pickering A and 56 days (-70%) for Pickering B in the 2010-12 period?			
17 18 19 20	b)	What specific factors or actions taken by OPG will result in these significant reductions in FLRs?			
20 21 22 23	c)	Does OPG have any examples from other jurisdictions where this type of improvement in FLRs has occurred?			
24 25 26	<u>Re</u>	<u>sponse</u>			
20 27 28 29 30 31 32 33	a)	OPG is forecasting improved Forced Loss Rate ("FLR") results for both the Pickering A and B Generating Stations as a result of a focus on equipment reliability. A similar focus on equipment reliability at Darlington Generating Station over the past several years has resulted in Darlington Generating Station being able to achieve a FLR of 0.7 per cent in 2008 and 1.6 per cent in 2009. The forecast FLR at Darlington Generating Station for both 2011 and 2012 is 1.5 per cent.			
34 35 36 37 38 39 40	b)	Beginning in 2009, OPG has observed performance improvements at Pickering B Generating Station reflecting the impact of various initiatives to improve material condition of the plant that have been undertaken since 2004. Improvements in FLR performance at Pickering A Generating Station are expected by the end of the test period as a result of the Pickering A Equipment Reliability program as discussed at Ex. F2-T2-S1, Attachment 2. In addition, all stations will be positively impacted by new programs (ER-01 Standard Equipment Reliability Program: ER-02 Improved Preventative			

- 40 (ER-01 Standard Equipment Reliability Program; ER-02 Improved Preventative
 41 Maintenance Program; ER-03 Critical Spares Obsolescence) arising from the 2009 42 2013 Nuclear Business Plan (Ex. F2-T1-S1, Attachment 1, page 7) designed to improve
 43 unit reliability.
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The 2010 results to date have shown improvements at the Pickering B Generating Station (3.76 per cent FLR). Improvements at the Pickering A Generating Station to date have been impacted by two forced outages at Unit 1 and technical issues on Unit 4's liquid zone control that were successfully resolved in January 2010.

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c) Yes. A recent benchmarking trip (July 2010) to the Wolsong station in South Korea has reinforced OPG's strategy to focus on equipment reliability.

10 Wolsong station units 1 - 4 have reduced their FLR from 3.13 per cent in 2001 to 0.48 per 11 cent by the end of 2009.

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$\frac{1}{2}$	Board Staff Interrogatory #040				
2 3 4	Re	Ref: Ex. E2-T1-S1, Attachment 4, pages 1-2			
5 6 7	Issue Number: 5.2 Issue: Is the proposed nuclear production forecast appropriate?				
8 9	Interrogatory				
10 11 12	OPG has included a "forecast for major unforeseen events" in this application. This forecast was not included in the previous application, EB-2007-0905.				
12 13 14	a)	What is the FLR day equivalent for the nuclear fleet of the 2 TWh per year reduction from unforeseen events?			
15 16 17	b)	Is this methodology considered to be a substitute for improving the estimates of FLRs?			
17 18 19	c)	Do other jurisdictions use similar methodologies for their production forecasts?			
20 21 22	<u>Re</u>	<u>Response</u>			
22 23 24 25 26 27	a)	Consistent with values for major unforeseen events in Ex. E2-T1-S1, Attachment 4, Table 1, from 2005 – 2008, the average Force Loss Rate ("FLR") equivalent days is 90.6 days at Pickering A Generating Station and 74.3 days at Pickering B Generating Station, which is equivalent to the 2 TWh allowance for major unforeseen events.			
27 28 29 30	b)	The methodology is not considered to be a substitute for improving the estimates of FLRs.			
30 31 32 33 34 35 36 37 38 39 40		As described on page 1 in E2-T1-S1, Attachment 4, examples of major unforeseen events include losses due to feeder thinning, an inter-station transfer bus issue, a resin release issue and calandria tube deterioration. OPG believes it is appropriate to separately identify the component of the production forecast associated with these types of events and to hold it at the business unit level rather than include it in the station FLR targets. This approach drives the stations towards stronger FLR performance as they are measured against stretch targets that do not include an allowance for major unforeseen events. In addition, major unforeseen events may occur at any station so it is not appropriate to build this allowance into individual station FLRs.			
41 42	c)	OPG is not aware of any industry standard practice to forecast FLR and specifically whether any other utility forecasts for major unforeseen events.			

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AMPCO Interrogatory #020

Ref: Ex. E2-T1-S1

5 **Issue Number: 5.2**

6 **Issue:** Is the proposed nuclear production forecast appropriate?

Interrogatory

10 What is the status of the Pickering A derate? Please provide a supporting explanation for the 11 derate and measures to mitigate the derate.

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14 <u>Response</u>15

16 The Pickering A Generating Station derate ended in November 2009 and both units were 17 returned to full power operation.

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The derate commenced during 2007 due to the inability of OPG to obtain Canadian Nuclear
 Safety Commission ("CNSC") concurrence with OPG's enhanced Neutron Overpower
 ("NOP") methodology.

22

Pickering A Generating Station production was impacted by 0.25 TWh on an annualized basis, starting in 2007. To mitigate and eliminate the derate, the CNSC partially accepted the enhanced NOP methodology. The CNSC concurred with OPG's position that the currently installed NOP trip set points for all OPG reactors are set at appropriate levels and that safety is not in question. As noted above, the units were returned to full power operation in November 2009.

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(f)

99.9

N/A

5,293.8

5,476.9

183.1

233.1

(50.0)

0.0

CME Interrogatory #025

3 Ref: Ex. E1-T1-S1, and E1-T1-S2

5 Issue Number: 5.2

- 6 Issue: Is the proposed nuclear production forecast appropriate?
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Interrogatory

10 The evidence indicates that the Nuclear production forecast for 2011 is about 1.0 TWh below 11 the forecast of 49.9 TWh approved by the Board for 2009. How much lower would the 24-12 month test period revenue deficiency be if the production forecast for the test period was 13 greater by 1 TWh?

14

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16 Response

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18 Table 4 below provides a recalculation of the nuclear revenue deficiency under the scenario 19 where forecast 2011 generation is 1 TWh higher. The impact is a reduction in the deficiency 20 of \$50M.

Nuclear Line Description 2011 2012 No. Total (d) (e) 49.9 50.0 1 Forecast Production (TWh)¹ 2 Prescribed Payment Amount (\$/MWh)² 52.98 52.98 3 Indicated Production Revenue (\$M) 2,644.9 2,648.9 (line 1 x line 2) 4 Revenue Requirement (\$M)³ 2.680.5 2.796.5 Revenue Requirement Deficiency (\$M) (line 4 - line 3) 147.5 5 35.6 Revenue Requirement Deficiency in current proposal (\$M)⁴ 85.6 147.5 6

Summary of Revenue Deficiency Test Period January 1, 2011 to December 31, 2012

Notes:

1 Ex. E2-T1-S1 Table 1.

From EB-2007-0905 Payment Amounts Order. 2

Change from Rate Proposal (line 5 - line 6)

Ex. I1-T1-S1 Table 1 (line 24). 2011 figure adjusted upward approximately \$3M to account for additional fuel required. 3

(50.0)

4 Ex. I1-T1-S1 Table 4, line 5.

Witness Panel: Deferral and Variance Accounts, Payment Amounts and Regulatory Treatments

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1		PWU Interrogatory #009
2 3 4 5	Ref: (a):	Ex. E2- T1-S1, page 12, lines 20-24. With regard to the impact of SBG on OPG's nuclear production forecast, OPG reports:
6 7 8 9 10 11		The Nuclear production forecast for the 2011 - 2012 period does not include a specific provision for reduced production due to surplus baseload generation. OPG was not subject to material reductions in nuclear generation due to surplus baseload generation situations in 2008 or 2009 and is currently not anticipating a significant impact on its nuclear facilities during the test period.
12 13 14 15	(b):	IESO's May 2010 18-Month Outlook, page iii http://www.theimo.com/imoweb/pubs/marketReports/18MonthOutlook_2010may.p df
17 18 19 20 21		From June 2010 to November 2011, approximately 2,900 megawatts (MW) of new and refurbished supply are scheduled to enter commercial operation. Of that, approximately 470 MW of new generation has been announced under the Feed-in Tariff (FIT) program and 180 MW contracted under the Renewable Energy Supply III (RES III) program.
22 23 24 25 26	(c):	IESO, FIT Dispatch and Operability, Gordon Drake, March 10, 2010. Slide 2 http://www.theimo.com/imoweb/pubs/consult/se57/se57-20100310-FiT-Dispatch- Operability.pdf
20 27 28 29 30 31 32 33 34 35 36 37		 Initial applications for FiT program totalled more than 9,000 MW Wind: 79% Solar: 16% Other: 5% Significant volumes of FiT projects are expected to connect to the distribution system Agreement with Samsung introduces another 2,500 MW of generation Wind: 80% Solar: 20%
38 39 40 41	(d):	Ontario Government Newsroom. Ontario's Coal Phase Out Plan. September 3, 2009 http://news.ontario.ca/mei/en/2009/09/ontarios-coal-phase-out-plan.html
42 43 44 45		Since 2003 coal-fired generation in Ontario has been decreasing. The closure of the coal-fired Lakeview Generating Station in 2005 eliminated carbon dioxide emissions equivalent to taking approximately 500,000 cars off Ontario roads.

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- Ontario Power Generation (OPG) will continue to reduce carbon dioxide emissions through an ongoing coal phase out plan which targets emissions from coal at 19.6 million tonnes in 2009 and 15.6 million tonnes in 2010. By 2011, coal electricity generation will be cut by twothirds.
- Issue Number: 5.2
- 9 **Issue:** Is the proposed nuclear production forecast appropriate?
 - **Interrogatory**

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- a) In setting out provisions in relation to SBG's associated with the nuclear production
 forecast, Ref (a), has OPG taken into account:
 - i) Increasing penetration of renewable generation as set out in Ref (b) and Ref (c)? If so, please describe how this has been factored in.
 - ii) The reduction of coal generation over 2010 and 2011 that would result from Ontario's Coal Phase Out Plan set out in Ref (d)? If so, please describe how this has been factored in.
- b) Please identify the impact, if any, on the asset life of OPG's nuclear facilities that might
 result from the ramping down/up related to SBG should there be an increased
 requirement for OPG's nuclear facilities to react to SBG.
- c) With regard to any impacts described in response to (b), what would be the anticipated costs related to these impacts?
 - d) If costs are identified in response to (c), would any of such costs apply to the test years?

Response

34 35 a) i)

Yes, increasing penetration of renewable generation has been considered. Please see the interrogatory response Ex. L-1-035 for additional details.

39 a) li)

- 40 As nuclear generation is considered a baseload supply, the forecast output of these 41 plants is not affected by assumptions regarding the availability of OPG coal generation.
- 43 b) Please see OPG's response to the interrogatory in Ex. L1-1-038. As indicated at Ex. E2-44 T1-S1, page 12, lines 23-24, and as noted in the interrogatory reference above, OPG

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- does not currently anticipate significant impact on its nuclear facilities during the test period as the result of surplus baseload generation ("SBG").
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c) Please see OPG's response to the Interrogatory in Ex. L1-1-038. As stated in part b) above, OPG does not currently anticipate significant impact on its nuclear facilities during the test period as the result of SBG. As a result, a cost analysis based on impacts of SBG has not been performed.

d) No costs due to SBG have been identified in OPG's 2010 – 2014 Nuclear Business Plan.

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1	SEC Interrogatory #017				
2 3 4 5	Ref: Ex. E2-T1-S1, Attachment 4 Ex. E2-T2-S2, page 9				
6 7 8	Issue Number: 5.2 Issue: Is the proposed nuclear production forecast appropriate?				
9	Interrogatory				
10 11 12 13 14 15 16 17 18 19 20	At E2-T1-S2, pg 1 the evidence states that the Forced Loss Rate (FLR) is the best estimate of the number of unplanned outage days that OPG will experience in the year due to unforeseen events that result in unit shutdowns. At E2-T1-S1; pg. 11 the evidence states that OPG proposes to reduce its nuclear production forecast by 2.0 TWh for its experience with forced outages and forced extensions due to major unforeseen events.				
	a)	Please explain the methodological difference between accounting for "unforeseen events" via the Forced Loss Rate and OPG's proposal to incorporate an incremental 2TWh reduction in the forecast for "major unforeseen events."			
20 21 22	b)	Is the forecast FLR currently incorporated into the nuclear forecast?			
22 23 24 25	c)	If yes, then why did OPG not adjust the FLR rate to incorporate a larger unforeseen loss factor of 2 TWh?			
20 27 20	<u>Response</u>				
28 29	a)	Please see response to Interrogatory L-01-040.			
30 31 32	b)	Yes, the forecast Forced Loss Rate ("FLR") is currently incorporated into the nuclear forecast (Ex. E2-1-2, Table 1c).			
34 35 36 37 38 39 40	c)	OPG believes it is appropriate to separately identify the component of the production forecast associated with major unforeseen events and to hold it at the business unit level rather than include it in the station FLR targets. This approach drives the stations towards stronger FLR performance as they are measured against stretch targets that do not include an allowance for major unforeseen events. In addition, major unforeseen events may occur at any station so it is not appropriate to build this allowance into individual station FLR targets.			

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SEC Interrogatory #018 1 2 3 Ref: Ex. F2-T1-S1, Attachment 1 4 Ex. E2-T1-S1, Table 1 5 6 Issue Number: 5.2 7 Issue: Is the proposed nuclear production forecast appropriate? 8 9 **Interrogatory** 10 In the OPG business plan presentation at F2-1-1 Attachment 1, pg.9 it identifies an 11 incremental "Additional Site performance target" of 2 TWh for 2011 and 2012. Are the 12 13 approved corporate target 50.9 and 52 TWh in 2011 and 2012 respectively? If so, why are 14 these different than those sought to be approved for rate making purposes? 15 16 17 Response 18 19 No, the approved corporate nuclear generation targets are 48.9 TWh in 2011 and 50 TWh in 20 2012. These targets form the basis for this Application. 21

22 The Additional Site performance target of 2 TWh in 2011 and 2012 represents a stretch 23 target for the Nuclear organization.

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SEC Interrogatory #019

Ref: Ex. E2-T1-S1

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5 **Issue Number: 5.2**

6 **Issue:** Is the proposed nuclear production forecast appropriate?7

Interrogatory

- a) How is the incentive payment plan related to the corporate performance targets listed at
 Exhibit F2-1-1, Attachment 8. Please describe what the particular benchmark are used
 and for which group of staff the performance plan and target apply to. Please indicate
 how the performance plan compensates for below, meeting or exceeding a corporate
 benchmark target.
- b) If no linkage between incentive plans and benchmark targets exist please indicate why
 this is so and what steps OPG is taking to link benchmarks with incentive pay.

<u>Response</u>

- a) Business Plan targets are part of the scorecard system and impact the awards under the
 incentive plan. The management group's Annual Incentive Plan ("AIP") for 2010 is based
 on Corporate, Fleet and Individual performance against a set of objectives outlined in the
 three scorecards. The Corporate scorecard result sets the total budget available for
 specific awards. The Fleet results impact their proportion of the Corporate total and then
 individual scores determine the award given to any employee.
- 29 The scorecards prescribe the weighting of various targets across the Corporate, Fleet 30 and Individual documents. For the Nuclear organization specifically, 20 per cent of the 31 2010 Nuclear Scorecard is related to meeting corporate generation targets, where 32 maximum payout is earned only if the stretch generation target is reached by Nuclear. 33 Nuclear's stretch targets are aligned to individual scorecard, such that individual targets 34 are met if Nuclear stretch generation targets are met. This AIP model ensures that 35 individual remuneration is subject to meeting both Corporate and Nuclear Scorecard 36 targets.
- 37
- b) A strong linkage exists between incentive plans and benchmark targets as OM&A and
 Capital Costs, All Injury Rate, Accident Severity Rate and Collective Radiation Exposure
 targets constitute another 30 per cent of the Nuclear scorecard, in addition to the 20 per
 cent related to meeting corporate generation targets.