

1 **GEC, Pembina, OSEA #1**

2
3 **Ref:** Ex. E1-T1-S1

4
5 **Issue Number:** 4.1

6 **Issue:** Is the methodology used by OPG to generate the proposed hydroelectric and
7 nuclear business production forecasts appropriate?

8
9 **Interrogatory**

10
11 For each nuclear *unit* owned by OPG and for each year of expected unit operation,
12 please provide the Company's projections of:

- 13
14 a) Rated capacity,
15 b) Nuclear fuel costs,
16 c) Non-fuel OM&A costs,
17 d) Gross capital additions,
18 e) Net generation exclusive of plant use,
19 f) Unit capability factor,
20 g) Forced outage hours,
21 h) Maintenance outage hours,
22 i) Equivalent availability factor (EAF), and
23 j) Any other projected performance factors.
24

25
26 **Response**

27
28 Data for nuclear units at OPG's prescribed facilities is provided below. Data for the
29 Bruce Power nuclear units is not provided as it is not relevant to determination of the
30 payments amounts for the prescribed facilities.

31
32 OPG is not familiar with the term "Equivalent Availability Factor (EAF)." It is not a
33 standard nuclear industry definition. OPG has provided unit capability factor which is the
34 industry standard unit of measure for capability comparisons across the industry.

35
36 For the information presented below:

- 37 • Forced outage data includes forced derates and extensions to planned outages.
38 • Planned outage hours is the term used by OPG to reflect scheduled outage
39 maintenance activities; OPG does not measure maintenance outage hours.
40 • Fuel costs include uranium, CTU fuel oil, used fuel disposal and used fuel storage
41 variable costs. Station fuel costs have been proportionally allocated to units based
42 on respective unit generation each year.
43 • OM&A costs include base, outage and project OM&A.
44 ○ Base OM&A costs are station direct costs divided by the number of operating
45 units. They do not include allocated nuclear or corporate support costs.

- 1 ○ Station outage OM&A costs are generally allocated by specific unit outage.
- 2 Outage OM&A does not include allocated nuclear or corporate support costs.
- 3 ○ OM&A project costs include all OM&A projects designated for the station, with
- 4 station totals allocated equally to each of the units.
- 5 ● Capital expenditures include all projects designated for the station, with station totals
- 6 allocated equally to each of the units.
- 7 ● Costs exclude P2/P3 safe storage expenditures.

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Year 2008	Measure	Darlington				Pickering					
		D1	D2	D3	D4	P1	P4	P5	P6	P7	P8
	Rated Capacity MW's (MCR - NET)	878	878	878	878	515	515	516	516	516	516
	Net Generation (TWh)	6.0	7.5	7.5	7.5	3.9	3.2	4.3	4.3	3.6	3.5
	Unit Capability Factor %	77.7	97.8	97.8	97.8	87.0	71.1	93.8	93.8	80.5	78.4
	Forced Outage Hrs **	156.4	196.8	196.8	196.8	1142.0	933.0	545.0	545.0	467.0	455.0
	Planned Outage Hrs	1802.0	0.0	0.0	0.0	0.0	1608.0	0.0	0.0	1248.0	1440.0
	Nuclear Fuel Costs (\$M) *	19.0	24.0	24.0	24.0	12.3	10.0	13.3	13.3	11.4	11.1
	Nuclear OM&A Costs (\$M)	151.2	84.2	85.5	84.2	103.8	151.1	77.9	76.2	105.1	108.9
	Capital Expenditures (\$M)	15.9	15.9	15.9	15.9	12.7	12.7	3.9	3.9	3.9	3.9

Year 2009	Measure	Darlington				Pickering					
		D1	D2	D3	D4	P1	P4	P5	P6	P7	P8
	Rated Capacity MW's (MCR - NET)	878	878	878	878	515	515	516	516	516	516
	Net Generation (TWh)	6.9	6.9	5.9	6.9	3.3	4.0	3.8	3.7	4.3	4.3
	Unit Capability Factor %	90.0	89.4	75.9	89.7	72.7	90.0	95.0	81.5	95.0	95.0
	Forced Outage Hrs **	160.8	159.8	135.6	160.3	708.0	876.0	383.0	376.0	438.0	438.0
	Planned Outage Hrs	720.0	768.0	1977.6	744.0	1680.0	0.0	1104.0	1248.0	0.0	0.0
	Nuclear Fuel Costs (\$M) *	28.5	28.5	24.3	28.5	13.3	16.1	15.3	15.0	17.4	17.4
	Nuclear OM&A Costs (\$M)	86.4	86.4	141.5	86.4	158.9	104.2	103.0	109.0	73.0	73.3
	Capital Expenditures (\$M)	5.1	5.1	5.1	5.1	2.6	2.6	1.5	1.5	1.5	1.5

* Fuel Costs includes Uranium/CTU/Disposal/Storage

** Includes forced derates and forced extensions to planned outages

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1 **GEC, Pembina, OSEA #2**

2
3 **Ref:** Ex. E1-T1-S1

4
5 **Issue Number:** 4.1

6 **Issue:** Is the methodology used by OPG to generate the proposed hydroelectric and
7 nuclear business production forecasts appropriate?

8
9 **Interrogatory**

10
11 Please provide the unit in-service date of each nuclear unit owned by OPG.

12
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14 **Response**

15
16 Unit in-service dates are provided below for the nuclear units at OPG's
17 prescribed facilities and the Bruce Power nuclear units.

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<u>UNIT</u>	<u>IN-SERVICE DATE</u>
Pickering A Unit 1	July 29, 1971
Pickering A Unit 1 following Layup	November 10, 2005
Pickering A Unit 2	December 30, 1971
Pickering A Unit 3	June 1, 1972
Pickering A Unit 4	June 17, 1973
Pickering A Unit 4 following Layup	September 25, 2003
Pickering B Unit 5	May 10, 1983
Pickering B Unit 6	February 1, 1984
Pickering B Unit 7	January 1, 1985
Pickering B Unit 8	February 28, 1986
Darlington Unit 1	November 14, 1992
Darlington Unit 2	October 9, 1990
Darlington Unit 3	February 14, 1993
Darlington Unit 4	June 14, 1993
Bruce Unit 1	September 1, 1977
	Laid up on October 16, 1997
Bruce Unit 2	September 1, 1977
	Laid up on October 08, 1995
Bruce Unit 3	February 1, 1978
	Laid up on April 09, 1998
Bruce Unit 3 following Layup	March 28, 2004
Bruce Unit 4	January 18, 1979
	Laid up on March 16, 1998
Bruce Unit 4 following Layup	November 28, 2003
Bruce Unit 5	March 1, 1985
Bruce Unit 6	September 14, 1984
Bruce Unit 7	April 10, 1986
Bruce Unit 8	May 22, 1987

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GEC, Pembina, OSEA #3

Ref: Ex. E1-T1-S1

Issue Number: 4.1

Issue: Is the methodology used by OPG to generate the proposed hydroelectric and nuclear business production forecasts appropriate?

Interrogatory

Please provide the projected retirement date of each nuclear unit owned by OPG with and without refurbishment.

Response

Current projected retirement dates of each nuclear unit owned and operated by OPG, developed on the basis of technical reviews and assuming no refurbishment, are as follows:

Nuclear Station	Unit	Projected Retirement Date
Darlington	Unit 1	March 2019
Darlington	Unit 2	March 2019
Darlington	Unit 3	December 2019
Darlington	Unit 4	March 2020
Pickering A	Unit 1	February 2022
Pickering A	Unit 2	Unit is in safe storage
Pickering A	Unit 3	Unit is in safe storage
Pickering A	Unit 4	April 2028
Pickering B	Unit 5	Q1 2014
Pickering B	Unit 6	Q1 2014
Pickering B	Unit 7	Q1 2014
Pickering B	Unit 8	Q1 2016

OPG is currently in the initial phase of assessing the refurbishment of Pickering B, with a recommendation with respect to Pickering B refurbishment options to be provided to OPG's Board of Directors no later than early 2009 (Ex. D2-T1-S3, Section 2.1.1, page 4). Darlington refurbishment assessment work is starting in 2008 (Ex. D2-T1-S3, Section 2.1.2, page 6). OPG has not undertaken any assessment of the refurbishment of Pickering A. Because the refurbishment review process is in its initial stages for Pickering B and Darlington and is non-existent for Pickering A, OPG is unable to provide projected retirement dates that assume refurbishment.

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Exhibit L

Tab 7

Schedule 3

Page 2 of 2

- 1 OPG does not operate Bruce Power units and therefore cannot provide projected
- 2 retirements dates (with or without refurbishment) which are based on technical review.
- 3 Current end-of-life dates for the Bruce stations used only for depreciation purposes are
- 4 provided in the response to interrogatory L-1-44.

1 **GEC, Pembina, OSEA #4**

2
3 **Ref:** Ex. E1-T1-S1

4
5 **Issue Number:** 4.1

6 **Issue:** Is the methodology used by OPG to generate the proposed hydroelectric and
7 nuclear business production forecasts appropriate?

8
9 **Interrogatory**

10
11 For each nuclear unit owned by OPG, please provide the following data for the period
12 1990 through 2004:

- 13
14 a) Rated capacity,
15
16 b) Net generation exclusive of plant use,
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18 c) Unit capability factor,
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20 d) Forced outage hours,
21
22 e) Maintenance outage hours,
23
24 f) Equivalent availability factor (EAF),
25
26 g) Nuclear fuel costs,
27
28 h) Non-fuel OM&A costs,
29
30 i) Gross capital additions, and
31
32 j) Any other available performance data.

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35 **Response**

36
37 OPG declines to provide historical information for 1990 through 2004 for the reasons
38 given in L-12-6.

GEC, Pembina, OSEA #5

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3 **Ref:** Ex. E1-T1-S1
4

5 **Issue Number:** 4.1

6 **Issue:** Is the methodology used by OPG to generate the proposed hydroelectric and
7 nuclear business production forecasts appropriate?
8

9 **Interrogatory**

10
11 For each option considered in Phase 1 of the Pickering B and Darlington refurbishment
12 projects, please provide the following information:
13

- 14 a) the projected effect of the additional capital investment on unit output, availability
15 factor, capability factor, and OM&A.
16
17 b) all feasibility and economic analyses of the option and without limiting the generality of
18 this request, any analysis that includes the base assumptions for unit performance
19 (i.e. if no refurbishment occurs).
20
21

22 **Response**

23
24 Analysis relating to Darlington refurbishment is starting in 2008 (Ex. D2-T1-S3, Section
25 2.1.2, page 6). Because the work on this analysis is in its initial stages, there is no
26 information related to the projected effects on the factors listed in a) above and no
27 feasibility and economic analyses are available as requested in b) above.

28 With respect to Phase 1 of Pickering B refurbishment, OPG's analyses are preliminary
29 and are not provided. While a number of the elements of the analysis have been
30 considered in detail, a number of uncertainties remain. Only when these uncertainties
31 are resolved will OPG be able to conclude its analysis.

32 Further, the information requested is not relevant to the issues the OEB must determine
33 in this proceeding. The Pickering B refurbishment project is covered by section 6(2)4 of
34 O. Reg. 53/05. The issues list includes four issues relating to section 6(2)4:
35

36 3.1 Are the costs and financial commitments OPG is seeking to recover
37 under section 6(2)4 incurred to increase the output of, refurbish or add
38 operating capacity to a prescribed facility?
39

40 3.2 If so, are the costs and financial commitments within project budgets
41 approved for that purpose by the board of directors of OPG?
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43 3.3 If the costs and financial commitments are not within project budgets
44 approved by the board of directors of OPG, are the costs and financial
45 commitments prudent?

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3.4 In section 6(2)4, what is a “firm financial commitment” and a “pre-engineering commitment

OPG is not seeking approval of any costs in respect of these refurbishments that are outside the approved project budgets. The project is clearly to refurbish a prescribed facility. Therefore, the information requested by the interrogatory is not relevant to the issues on the issues list.

Further, the appropriate time to consider the information requested by this interrogatory is in the context of OPG’s next application for payment amounts. At that time, a recommendation will have been made with respect to the Pickering B refurbishment option (Ex. D2-T1-S3, page 4, lines 21 - 22) based on a detailed assessment of the business case. The cost consequences of any decision to proceed with refurbishment will only have an impact on subsequent test periods after the capital costs have entered rate base.