K3.2

SCHOOL ENERGY COALITION

CROSS-EXAMINATION MATERIALS

OPG PANEL 2

TABLE OF CONTENTS

TAB 1

ONTARIO POWER GENERATION

5 Year Performance Plan

2008

Metric	Pickering A	Pickering B	Darlington
Safety			
All Injury Rate	0.73	0.96	1.04
2-Year Industrial Safety Accident Rate	0.14	0.07	0.04
2-Year Collective Radiation Exposure (man-rem per unit)	44.2	95.81	72.83
Airborne Tritium (TBq) Emissions per Unit	101.0	50.7	40.0
Fuel Reliability (microcuries per gram)	0.00059	0.00159	0.00025
2-Year Reactor Trip Rate (# per 7,000 hrs)	1.22	0.26	0.00
3-Year Auxiliary Feedwater System Unavailability	0.0119	0.0040	0.0017
3-Year Emergency AC Power Unavailability	0.0081	0.0091	0.0020
3-Year High Pressure Safety Injection Unavailability	0.0012	0.0001	0.0001
Reliability			
WANO NPI (Index)	60.84	60.93	95.67
2-Year Forced Loss Rate (%)	37.90	18.19	0.93
2-Year Unit Capability Factor (%)	56.6	73.17	91.99
2-Year Chemistry Performance Indicator (Index)	1.13	1.25	1.00
1-Year Online Elective Maintenance (work orders/unit)	425	695	313
1-Year Online Corrective Maintenance (work orders/unit)	14	28	8
Value for Money			
3-Year Total Generating Costs per MWh ($/Net MWh)	92.27	58.68	30.08
3-Year Non-Fuel Operating Costs per MWh ($/Net MWh)	82.62	50.95	25.10
3-Year Fuel Costs per MWh ($/Net MWh)	2.64	2.68	2.62
3-Year Capital Costs per MW DER** ($/MW)	32.07	32.44	18.79

- Continue to lead industry in overall conventional and nuclear safety performance.
- Increase fuel reliability.
- Strengthen equipment reliability and human performance to reduce reactor trips.
- Focus on work order readiness, reducing backlogs, improving maintenance effectiveness, and work management.
- Reduce base and outage operating costs to improve fleet-wide total generating costs per MWh. Darlington becomes industry leader in costs. Pickering A and B narrow gaps.

2014

Pickering A	Pickering B	Darlington
Safety		
1.2	1.2	1.2
0.15	0.15	0.15
125	82	66
81.1	36.5	27.0
0.0005	0.0005	0.0005
0.50	0.50	0.50
0.0200	0.0200	0.0200
0.0250	0.0250	0.0250
0.0200	0.0200	0.0200
Reliability		
70.9	81.3	99.1
4.00	4.00	1.25
84.3	81	93.3
1.04	1.04	1.01
278	300	214
9	15	4
Value for Money		
70.81	64.80	36.75
60.07	52.47	28.82
6.01	7.45	5.43
34.73	34.67	20.37

2014 WANO indicator targets are set to provide maximum NPI points only. 2014 Cost Targets are above 2008 due to expected cost escalation of Median and Best Quartile Costs per EUCG panel historical trend.
2010-2014 values represent annual targets. Actuals will be calculated based on rolling average definitions.

ONTARIO POWER GENERATION

Safety Cornerstone
Targets and Gap Closure through Initiatives

ID	Initiative	Owner	All Injury Rate			Collective Radiation Exposure			Fuel Reliability Index			Environmental Index			Accident Severity Rate			Industrial Safety Accident Rate			Airborne Tritium Emissions		
			DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB
Current Performance (2009 Projection at date of Target Setting)			1.3	1.3	1.3	78.50	147.00	103.45	0.0005	0.0028	0.0012	85	80	80	4.75	4.75	4.75	0.15	0.15	0.15	4000	12000	7000
IS-01	Musculoskeletal Disorders Prevention	Greg Jackson	0.10	0.10	0.10										0.64	0.64	0.64	0.04	0.03	0.04			
IS-02	Safety Behaviours Assessment	Greg Jackson	0.10	0.10	0.10										0.64	0.64	0.64	0.04	0.03	0.04			
RP-05	Reduce collective radiation exposures (CRE) during reactor face work through optimization of reactor face shielding	Tom Wong				6.40	15.80	5.40															
RP-10	Detritiation of Reactor PHT & Moderator Systems to reduce the source term radiation	Tom Van Horne				✓	2.00	2.00														525	1050
RP-09	Optimization of Fueling Machine Filtration at Sites to minimize Co-59 injection and buildup of Co-60	John Pinnegar				1.90	5.90	1.00															
EN-03	Improved Fuel Reliability Index	M. O'Neill							✓	0.0023	0.0007												
Site Contribution to Gap Closure Identified by Functional Teams						6.80	15.00	6.30				5	0	0								6125	2100
2014 TARGET			1.2	1.2	1.2	66.00	125.00	82.00	0.0005	0.0005	0.0005	80	80	80	3.30	3.30	3.30	0.15	0.15	0.15	4000	6000	5400
Remaining Gap			(0.1)	(0.1)	(0.1)	(2.60)	(16.70)	6.75	0.0000	0.0000	0.0000	(10)	0	0	0.17	0.17	0.17	(0.08)	(0.06)	(0.08)	0	(125)	(500)

✓ = impacts metric, enabler for performance but not quantified for gap closure
italics = initiative has impact in another cornerstone
Bold = Key initiative (See Appendix)

IS-03, IS-04 and RP-26 are not included in table above as planning is still under development.

ONTARIO POWER GENERATION

Reliability Cornerstone
Targets and Gap Closure through Initiatives

ID	Initiative	Owner	Unit Capability Factor			Forced Loss Rate			Chemistry Performance Indicator			Online Elective Maintenance Backlog			Online Corrective Maintenance Backlog			Equipment Reliability Indicator			Planned Outage Performance (Days)			Criticality 1 Deferral of PMs		
			DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB
Current Performance (2009 Projection at date of Target Setting)			86%	79%	87%	2.0%	11.5%	6.2%	1.01	1.08	1.10	311	425	685	8	14	28	67	45	52	171.7	106.5	135.3	7	20	15
ER-03	Implement Critical Spares and Proactive Obsolescence Program	Paul Vonhatten	0.125%	0.125%	0.125%																					
OU-02	*Outage Improvement Strategy*	*Jim Woodcroft*																			✓	✓	✓			
ER-01	**Implement a Fleet Standardized Equipment Reliability**	**Paul Vonhatten**	✓	✓	✓	0.3%	1.88%	0.8%										15.0	26.0	14.0						
ER-02	**Implement Improved PM Program**	**Paul Vonhatten**	✓	✓	✓	0.08%	0.75%	0.2%							3	5	13	7.0	11.0	6.0						
OP-05	*Human Performance Improvement Plan (Contains PI-04)*	*Granville, Henderson, Guglielmi*	✓	✓	✓	0.38%	2.70%	1.1%																		
OP-02	WM Performance Improvement	Dave Walsh										✓	✓	✓	✓	✓	✓									
MA-01	Improve FIN Team Effectiveness	Jim Whyte				✓	✓	✓				✓	52	120												
MA-07	Leverage Darlington OEMB Process Across Fleet	Chris Johnston											95	265												
EN-01	**Work Order Readiness**	**Steve Woods**										*96														
Site Contribution to Gap Closure Identified by Functional Teams			0%	0%	0%		1.1%		0.01	0.06	0.10	0	0	0	0	0	0							*5	*11	*11
2014 TARGET			93%	84%	81%	1.25%	4.0%	4.0%	1.01	1.04	1.04	215	278	300	5	9	15	89.0	82.0	72.0	80.8	89.0	225.0			
Remaining Gap			7%	5%	(6%)	0.0%	1.1%	0.1%	(0.01)	(0.02)	(0.04)	0	0	0	0	0	0	0.0	0.0	0.0	Commitment to Meet Plan			0	0	0

✓ = impacts metric, enabler for performance but not quantified for gap closure
italics = initiative has impact in another cornerstone
Bold = Key initiative (See Appendix)

WM-01 is not included in table above as planning is still under development.

ONTARIO POWER GENERATION

Human Performance Cornerstone
Targets and Gap Closure through Initiatives

ID	Initiative	Owner	Event Free Day Resets			CAP - Quality of Level 1&2 Evaluations			CAP - Effectiveness of Level 1&2 SCRs			CAP - Timeliness of Level 1&2 SCRs			Training Index		
			DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB	DN	PA	PB
Current Performance (2009 Projection at date of Target Setting)			8	4	8	80.0	80.0	80.0	50.0	80.0	60.0	92.0	90.0	58.0	70	70	75
PI-03	CAP is Core	Tom Smart				10.0	10.0	10.0	30.0	7.5	22.5	2.4	3.8	28.0			
PI-02	Implement Human Performance Rapid Response	Tom Smart	2	0.0	2												
OP-05	***Human Performance Improvement Plan***	***Station DOMs***	*2*	*2*	*2*												
PI-01	Program efficiency and quality, and additionally reduce associated FLM administrative burden	Tom Smart						1.1	10.0	2.6	7.6	0.8	1.2	9.2			
TR-02	Computer Based Training Development to Reduce Classroom Training Resources	Gord Haverluck													5.0	5.0	3.75
OU-02	**Outage Improvement Strategy**	**Jim Woodcroft**													5.0	5.0	3.75
Site Contribution to Gap Closure Identified by Functional Teams																	
2014 TARGET			4	2	4	90.0	90.0	90.0	90.0	90.0	90.0	95.0	95.0	95.0	90	90	90
Remaining Gap			0	0	0	0.0	0.0	(1.1)	0.0	(0.1)	(0.1)	(0.2)	0.0	(0.2)	(10)	(10)	(8)

✓ = impacts metric, enabler for performance but not quantified for gap closure
italics = initiative has impact in another cornerstone
Bold = Key initiative (See Appendix)

TR-04 included in the Value for Money slide .

ONTARIO POWER GENERATION

Value for Money Cornerstone
Targets and Gap Closure through Initiatives

ID	Initiative	Owner	Total OM&A Savings Required										Impact to Capital								
			DN	PA	PB	NP&T	E&M	PINO	NSC	IM&CS	NWM	Safety	DN	PA	PB	NP&T	E&M	PINO	NSC	IM&CS	NWM
Total 5 Yr Savings Required		N/A	$ 77,760	$ 53,000	$ 55,000	$102,953	$ 26,757	$ 1,000	$ 7,014	$ 17,733	$ 3,411	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MA-08	**Days Based Maintenance**	Doug Radford	($4,323)	($8,468)	($13,125)	$0	$0	$0	$0	$0	$0	$0	$1,500	$775	$775	$0	$0	$0	$0	$0	$0
MA-04	Centralize M&TE	Jim Whyte	($788)	$0	($788)	$0	$0	$0	$0	$0	$0	$0	$350	$0	$350	$0	$0	$0	$0	$0	$0
MA-09	Implement Single Source Laundry Supplier	Doug Radford	($4,000)	($3,200)	($4,800)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
EN-02	**Engineering Value for Money Improvement**	Fred Dermarkar	($3,510)	($15,005)	($15,005)	$0	($5,200)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
IS-04	Safety Training Qualifications to Capability Profiles	Greg Jackson	($660)	($417)	($579)	($105)	$0	$0	$0	$0	$0	($1,743)	$0	$0	$0	$0	$0	$0	$0	$0	$0
FS-03	Revenue Opportunity by Opening the Wesleyville location to external organizations	Don Trylinski	($500)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
TR-04	Initial Authorization Training Program	Silviu Idita	$0	$0	$0	$11,498	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
FP-02	Labor Cost Reductions	Cathy Treacy	($1,900)	($1,340)	($2,100)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
RP-26	Area Mapping	Robin Manley	$100	$50	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
N/A	Summary of Other Initiatives	N/A	($17,962)	($15,609)	($18,987)	$6,582	$160					$380	$1,035	$1,035	$1,035		$0				
Estimated Savings from Initiatives			($33,543)	($43,989)	($55,384)	$17,975	($5,040)	$0	$0	$0	$0	($1,363)	$2,885	$1,810	$2,160	$0	$0	$0	$0	$0	$0
Gap closed in Site and Support Group Plans			$77,760	$53,000	$55,000	$79,879	$26,757	$1,000	$7,014	$ 29,533	$3,411	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Final Gap to Initial Savings Target			$0	$0	$0	$23,074	$0	$0	$0	($11,800)	$0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

✓ = impacts metric, enabler for performance but not quantified for gap closure
italics = initiative has impact in another cornerstone
Bold = Key initiative (See Appendix)

Site and support groups were asked to meet financial targets though a combination of fleet-wide savings initiatives (above) and site specific initiatives (in supporting site presentations).

MS-02, MS-03 and MA-06 are not included in table above as planning is still under development.

ONTARIO POWER GENERATION

Nuclear's Gap Based Business Planning Results

Nuclear's gap-based process has resulted in a business plan that reflects our objective of improved operational and financial performance across the fleet.

ScottMadden Inc., a general consulting firm, was retained by OPG management to undertake a benchmarking study comparing its nuclear financial and non-financial performance with industry peers. In the final benchmarking report, ScottMadden reported the following:

"It is our opinion that OPGN has undertaken the actions necessary to successfully pilot a gap-based business planning process as originally envisioned. These actions include: (a) fairly benchmarking the company's operational and financial performance to external peers, (b) using the benchmarking results to establish performance improvement targets that will achieve, or significantly drive the company closer to, top quartile industry performance, and (c) developing and implementing a gap-based business planning process that identified the improvement initiatives best able to close the identified performance gaps."

ONTARIO POWER GENERATION

Cost Plan - OM&A Cost Savings

Nuclear Operations 2010-2014 Business Plan

($ millions)

	2010	2011	2012	2013	2014	Total
Total OM&A - 2009-2013 Approved BP	$1,679	$1,579	$1,617	$1,764		
Targeted Reductions (Note 1)	-$40	-$53	-$61	-$87		
Additional Expenditures (Note 2)	$14	$17	$20	$21		
Additional Savings (Note 3)	-$58	-$58	-$68	-$68		
Nuclear Operations OM&A Plan-over-Plan Reduction	**-$84**	**-$94**	**-$110**	**-$135**		**-$423**
Nuclear Operations OM&A 2010-2014 Submission	**$1,595**	**$1,485**	**$1,507**	**$1,629**		
Corporate Planning Guidelines 2010-2014	**$1,639**	**$1,579**	**$1,617**	**$1,764**		
Nuclear Operations Savings above Guidelines	**-$44**	**-$94**	**-$110**	**-$135**		
Pickering B Continued Operations Investment		$51	$42	$37		
Pickering A P2/P3 Project Timing	$9					
Total OM&A Submission 2010-2014	**$1,604**	**$1,535**	**$1,549**	**$1,666**	**$1,673**	

Note 1:

	2010	2011	2012	2013
Pickering A	-$6.0	-$13.0	-$10.0	-$12.0
Pickering B	-$9.0	-$9.0	-$9.0	-$14.0
Darlington	-$9.0	-$9.0	-$11.2	-$21.4
Nuclear Programs & Training	-$10.0	-$14.4	-$20.8	-$25.4
Nuclear Supply Chain	-$0.5	-$0.5	-$0.5	-$2.0
Engineering & Modifications	-$2.0	-$3.5	-$5.2	-$7.0
Nuclear Waste Management	-$0.2	-$0.3	-$0.4	-$0.6
Inspection Maintenance & Commercial Services	-$2.3	-$2.9	-$3.9	-$4.3
Performance Improvement & Nuclear Oversight	-$0.2	-$0.2	-$0.2	-$0.2
CNO Office	-$1.0	$0.0	$0.0	$0.0
Targeted Reductions - Base and Outage	-$40.2	-$52.8	-$61.2	-$86.9

Note 2:

	2010	2011	2012	2013
2010 Vacuum Building Outage	$14.0			
2011/2012 Turbine Work - PA		$7.2	$8.2	
Underfunded OM&A Project Portfolio		$5.0	$5.0	$10.0
NPT Shortfall on Targeted Reductions		$4.3	$6.3	$10.8
Additional Expenditures	$14.0	$16.5	$19.5	$20.8

Note 3:

	2010	2011	2012	2013
Impact of Lower Labour Burden Rate	-$38.0	-$38.5	-$48.7	-$47.5
Impact of New Labour Rates	-$12.4	-$13.0	-$12.7	-$13.8
SAVHO Reallocation to Capital Projects	-$5.4	-$5.0	-$4.7	-$3.8
Continued Operations IM&CS Savings	-$2.0			
		-$1.3	-$2.1	-$3.3
Additional Savings	-$57.8	-$57.8	-$68.2	-$68.4

ONTARIO POWER GENERATION

Financial Plan

($ Millions)	Business Plan 2010-2014					Plan-Over-Plan			
	2010	2011	2012	2013	2014	2010	2011	2012	2013
OM&A Base and Outage Expenditures									
Pickering A	260.1	236.5	235.0	240.7	259.1	(17.3)	(18.1)	(15.7)	(26.0)
Pickering B	371.9	369.5	366.5	373.8	392.8	(13.9)	11.9	5.0	(0.2)
Darlington	398.2	362.6	372.1	471.6	426.9	(17.5)	(23.2)	(28.5)	(39.3)
Engineering & Modifications	68.4	63.9	63.8	66.8	66.9	(11.2)	(14.5)	(16.3)	(16.9)
Nuclear Programs & Training	234.1	249.7	253.9	255.9	264.3	(30.4)	(18.5)	(24.9)	(24.6)
Nuclear Supply Chain	68.6	68.4	69.1	69.3	70.5	(3.3)	(3.4)	(3.8)	(5.2)
Inspection Maintenance & Commercial Services	32.5	32.9	33.2	33.5	33.5	(7.6)	(9.0)	(10.8)	(12.2)
Nuclear Waste Management	4.3	4.4	4.6	5.4	4.3	(0.3)	(0.4)	(0.5)	(0.7)
PINO	9.1	9.2	9.4	9.6	10.0	(0.6)	(0.6)	(0.7)	(0.7)
CNO Office / Other	22.6	9.9	13.1	11.7	11.9	13.4	0.3	0.3	0.3
Total Base & Outage	**1,470.0**	**1,407.0**	**1,420.8**	**1,538.3**	**1,540.4**	**(88.8)**	**(75.3)**	**(96.0)**	**(125.5)**
OM&A Portfolio Projects	111.7	108.3	111.2	115.7	121.2	6.7	11.9	11.2	15.7
OM&A PB Continued Operations	1.8	19.9	17.0	11.9	11.3	(2.0)	19.9	17.0	11.9
OM&A P2/P3 Projects	20.6	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0
Total OM&A	**1,604.1**	**1,535.1**	**1,549.0**	**1,665.9**	**1,672.9**	**(75.0)**	**(43.5)**	**(67.8)**	**(97.9)**
Fuel & Waste Provision Expense									
Fuel (Uranium & Combustion Turbine Unit)	178.9	209.1	233.2	232.5	238.6	(0.5)	(14.6)	(17.9)	(16.6)
Fuel Provisions	23.5	25.7	27.2	27.9	29.9	(1.3)	(1.2)	(1.4)	(10.3)
Total - Fuel & Waste Provisions	**202.4**	**234.8**	**260.5**	**260.4**	**268.5**	**(1.7)**	**(15.7)**	**(19.3)**	**(27.0)**

ONTARIO POWER GENERATION

Financial Plan

($ Millions)	2010	2011	2012	2013	2014
Projects - Capital & OM&A and MFA					
OM&A Portfolio Projects	111.7	108.3	111.2	115.7	121.2
OM&A Pickering B Continued Operations	1.8	19.9	17.0	11.9	11.3
Capital Portfolio Projects	172.0	172.0	172.0	172.0	172.0
Total Portfolio and Other Projects	**285.5**	**300.2**	**300.2**	**299.6**	**304.5**
OM&A P2/P3 Projects	20.6	0.0	0.0	0.0	0.0
Capital P2/P3 Projects	8.8	0.0	0.0	0.0	0.0
Total P2/P3 Projects	**29.5**	**0.0**	**0.0**	**0.0**	**0.0**
Minor Fixed Assets	**20.2**	**19.7**	**19.5**	**19.6**	**19.7**
Total OM&A and Capital Projects and MFA	**335.1**	**319.9**	**319.7**	**319.2**	**324.3**

ONTARIO POWER GENERATION

Staff Plan

MAJOR DEPARTMENTS	Headcount	Full Time Equivalent					Variance from BP 2009-2013				
Regular Staff	2009 Year-End	2010	2011	2012	2013	2014	2009 YE	2010	2011	2012	2013
Pickering A	1,266	1,129	998	987	986	982	(12)	29	10	9	8
Pickering B	1,608	1,636	1,606	1,558	1,554	1,523	2	77	66	24	10
Darlington	1,703	1,693	1,667	1,663	1,647	1,654	(51)	(25)	(20)	(19)	(24)
Engineering & Modifications	674	667	626	606	576	568	(3)	0	(12)	(23)	(34)
Nuclear Programs & Training	976	1,027	988	973	961	968	6	(15)	(39)	(69)	(66)
Nuclear Supply Chain	380	370	362	353	347	343	(18)	7	3	3	(3)
Performance Improvement & Nuclear Oversight	57	57	57	57	57	57	-	(1)	-	-	-
Inspection Maintenance & Commercial Services	589	545	484	439	406	373	(6)	(1)	(63)	(108)	(141)
Nuclear Waste Management	312	310	307	307	307	307	(1)	(3)	(6)	(6)	(6)
CNO Office	2	2	2	2	2	2	-	-	-	-	-
Regular Staff Total	7,567	7,435	7,095	6,945	6,842	6,776	(83)	68	(61)	(189)	(256)

Plan-Over-Plan Major Business Reason for Regular Staff Variance from BP 2009-2013	2009 YE	2010	2011	2012	2013
Pickering A - Unit 2/3 Long Term Provision hires offset by staff reductions in major departments	(17)	9	10	9	8
Pickering B - Reductions in staff are attributable to Fleet and Station Initiatives	2	4	(40)	(68)	(72)
Pickering B - Staff hires for turbine crew funded from purchased services		19	19	19	19
Pickering B - Continued Operations Staff	-	54	87	73	63
Darlington - Staff Reductions in Operations, Maintenance, Fuel Handling, Engineering, Projects Support and MSSP	(62)	(25)	(20)	(19)	(24)
Engineering & Modifications - Staff Reductions in major departments	(3)	-	(12)	(23)	(34)
Nuclear Programs & Training - Staff Reductions in Nuclear Programs and Nuclear Integration	1	6	(26)	(46)	(37)
Nuclear Supply Chain - Staff Hires offset by reductions in major departments	(18)	7	3	3	(3)
Performance Imp. & Nuclear Oversight - Eliminate 1 Engineering Position from VP's Office	-	(1)	-	-	-
Inspection Maintenance & Comm. Serv. - Discontinuing Service Agreements with Bruce Power	(6)	(4)	(65)	(110)	(143)
Nuclear Waste Management - Planned reductions in Used Fuel Ops. and Engineering Staff offset by hires in Waste Ops	(1)	(3)	(6)	(6)	(6)
Other Contributing Variances	21	2	(11)	(21)	(27)
TOTAL REGULAR STAFF REQUIREMENTS - PLAN-OVER-PLAN	(83)	68	(61)	(189)	(256)

FTE #'s do not reflect changes due to reorganization of Nuclear Operations and Nuclear Refurbishment, Projects and Support.
FTE #'s do not include Security.

TAB 2

Filed: 2010-05-26
EB-2010-0008
Exhibit A2-2-1
Attachment 1

3.2 RESOURCE AND PERFORMANCE PLANNING GUIDELINES

The OPG Board's approval in February of the 2009-2013 Business Plan incorporated a deferral of the next rate application from 2010 to 2011. Management committed at that time to reduce 2010 OM&A by $85 million from levels in the current plan in order to ameliorate the financial impact of deferring the application. The resulting OM&A guidelines for 2010, as endorsed by the Executive Committee, are shown in the following table.

Guidelines for 2011 OM&A expenditures will be established and approved by the Executive Committee in June. The decision on guidelines will be made after considering a number of factors, including:

- The progress BUs are making on meeting their 2010 expenditure targets, and
- The continuing need to prudently reduce or defer expenditures, to reduce ratepayer costs

Until guidelines for 2011 and beyond are set, the interim guidelines are the planned OM&A levels for 2011-2013 as approved in the 2009-2013 business plan, as indicated in the table below.

OM&A - $Millions	2009 Business Plan*		2010		2011	2012	2013
	2009	2010	Reduction	Guideline	Interim Guideline		
Nuclear Operations	1,610	1,679	(40)	1,639	1,578	1,617	1,764
NGD and NNB	77	11	-	11	15	23	31
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Hydro	217	237	(5)	232	236	233	238
BS & IT	232	232	(12)	220	244	251	258
Finance	91	93	(1)	92	95	99	100
Human Resources	56	58	(1)	57	60	62	63
Corporate Affairs & Energy Markets	53	53	-	53	51	51	54
ESLA	31	31	-	31	25	25	26
Business Unit OM&A	2,818	2,832	(79)	2,753	2,730	2,804	2,976
Corporately Held Costs	170	185	(6)	179	256	330	460
Total OM&A	2,988	3,017	(85)	2,932	2,986	3,134	3,436
* before reductions							

3.3 COSTING ASSUMPTIONS

Services provided to others and associated revenues should be identified and held at the business-level along with direct costs through Cost of Goods Sold.

Financial Planning is accountable for obtaining and/or developing forecasts for the following financial items:

- Interest expense, depreciation costs and income taxes – based on input from businesses. ***It is critical that BU's provide accurate interest capitalization and realistic, trended in-service addition details for capital projects, to facilitate this.*** For hydroelectric, the split between regulated and non-regulated assets must be carefully reviewed. The forecasts for regulated assets will form the basis for submission to the OEB, and therefore both the estimates, and the trending must be defensible.
- Energy revenues and [redacted] will be forecast by Energy Markets.
- Bruce Lease revenues will be forecasted and held at the corporate level; however, provision of services to Bruce Power outside of those included in the lease should be provided at the BU level.
- The non-current pension and OPEB components of the Payroll Burden Rate for regular staff will be kept at the corporate level.
- Guarantee fee on nuclear liability will be calculated and held at the corporate level.

While these items are consolidated at a corporate level, they will each continue to be allocated to sites and lines of business for purposes of segmented and management reporting.

TAB 3

Numbers may not add due to rounding.

Table 1
Base OM&A - Nuclear ($M)

Line No.	Division	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
	Nuclear Stations						
1	Darlington NGS	294.6	304.7	308.2	291.5	302.1	317.8
2	Pickering A NGS	162.5	187.6	187.3	175.9	172.9	170.6
3	Pickering B NGS	287.4	306.6	292.2	285.3	279.1	288.6
4	Pickering B Continued Operations	0.0	0.0	1.6	9.8	17.7	14.7
5	Pickering B Refurbishment	23.3	9.0	4.3	1.2	0.0	0.0
6	**Total Stations**	767.9	807.9	793.7	763.7	771.8	791.5
	Nuclear Support Divisions						
7	Engineering	60.5	62.4	59.9	56.6	55.8	56.5
8	Projects & Modifications	10.7	12.2	13.9	7.6	5.4	5.1
9	Facilities Management	41.8	38.4	41.8	41.5	42.5	43.4
10	Programs & Training	160.1	169.5	198.4	191.5	193.3	195.1
11	Supply Chain	80.2	77.0	63.6	67.0	67.0	67.7
12	Performance Imprvmnt & Oversight	28.8	29.5	8.5	9.1	9.2	9.4
13	Inspection & Mtce Services	37.7	45.6	38.1	30.8	31.2	31.4
14	Commercial Services[1]	1.3	1.4	1.5	1.7	1.3	1.4
15	Waste & Transportation Services	4.8	5.7	4.2	4.8	5.0	5.1
16	Nuclear Level Common	11.1	2.9	(7.1)	12.6	9.9	13.1
17	**Total Support**	437.0	444.5	422.8	423.4	420.6	428.3
18	**Total**	1,204.9	1,252.4	1,216.5	1,187.0	1,192.3	1,219.8

Notes:
1 Previously Commercial Activities.

Numbers may not add due to rounding.

Table 2
Base OM&A - Nuclear ($M)

Line No.	Resource Type	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan	Test Period Percentage[1]
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	Labour Regular	880.4	902.9	901.3	898.7	908.9	941.8	76.7%
2	Overtime	57.9	62.6	52.0	29.9	31.1	32.6	2.6%
3	Augmented Staff	10.2	12.1	13.1	6.9	5.5	1.4	0.3%
4	Materials	81.4	88.9	78.3	80.3	81.9	80.7	6.7%
5	License	16.9	18.2	22.1	19.6	20.2	20.9	1.7%
6	Other Purchased Services	121.7	128.1	114.7	109.7	102.1	99.6	8.4%
7	Other	36.4	39.6	34.9	42.0	42.7	42.8	3.5%
8	Total	1,204.9	1,252.4	1,216.5	1,187.0	1,192.3	1,219.8	100.0%

Notes:
1 Test Period Percentage = Sum of Test Period Resource Costs divided by Sum of Test Period Base OM&A.

Numbers may not add due to rounding.

Table 3
OM&A Base Labour - Cost Escalation and Payroll Burden Change ($M)

Line No.	Function	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan	2012 Plan 53rd Week[1]
		(a)	(b)	(c)	(d)	(e)	(f)
	Operational Functions - Station						
1	Darlington NGS	4.2	3.6	(0.2)	10.5	7.9	4.8
2	Pickering A NGS	2.3	2.0	(0.1)	6.1	4.4	2.6
3	Pickering B NGS	4.1	3.6	(0.2)	10.6	8.2	4.8
4	**Total Stations**	10.6	9.2	(0.6)	27.1	20.5	12.2
5	**Operational Functions - Support**	5.1	4.3	(0.3)	12.4	9.5	5.6
6	**Total Nuclear Operations**	15.7	13.5	(0.9)	39.5	30.0	17.8
7	**Labour Cost Escalation**	24.4	25.8	47.5	28.2	28.6	
8	**Payroll Burden Change**	(8.7)	(12.3)	(48.4)	11.3	1.4	

1 The amounts shown for 53rd week in 2012 are additive to the 2012 cost escalation amounts in column (e).

Numbers may not add due to rounding.

Table 4
Nuclear Base OM&A by Function ($M)
Plan - Calendar Year Ending December 31, 2012

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				615.4
2	- Operations	77.6	46.9	66.9	191.4
3	- Maintenance	114.0	54.8	120.7	289.5
4	- Fuel Handling	32.4	16.3	21.7	70.3
5	- Rad Protection, Chemistry & Envrnt	17.3	2.9	19.0	39.2
6	- Pickering Common Services		8.2	16.7	24.9
7	Station Engineering	29.0	21.3	27.9	78.2
8	Work Management	12.0	10.9	10.9	33.8
9	Support Services	17.2	9.2	4.7	31.1
10	Tritium Removal Facility	18.3			18.3
11	Continued Operations			14.7	14.7
12	Pickering B Refurbishment			0.0	0.0
13	**Total Stations**	317.8	170.6	303.2	791.5
	Operational Functions - Support				
14	Engineering				56.5
15	Projects & Modifications				5.1
16	Facilities Management				43.4
17	Programs & Training				195.1
18	- Records and Admin				25.4
19	- Nuclear Programs & Training				110.1
20	- Security				59.5
21	Supply Chain				67.7
22	Performance Improvement & Oversight				9.4
23	Inspection & Maintenance Services				31.4
24	Commercial Services				1.4
25	Waste & Transportation Services				5.1
26	Nuclear Level Common				13.1
27	**Total Support**	0.0	0.0	0.0	428.3
28	**Total Nuclear**	317.8	170.6	303.2	1,219.8

Numbers may not add due to rounding.

Table 5
Nuclear Base OM&A by Function ($M)
Plan - Calendar Year Ending December 31, 2011

Line No.	Division	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				600.4
2	- Operations	68.9	44.9	64.3	178.0
3	- Maintenance	111.3	60.7	119.5	291.4
4	- Fuel Handling	31.1	15.4	22.8	69.2
5	- Rad Protection, Chemistry & Envrnt	16.8	2.9	18.2	37.9
6	- Pickering Common Services		7.8	15.9	23.8
7	Station Engineering	29.4	21.7	27.3	78.4
8	Work Management	11.5	10.7	11.0	33.2
9	Support Services	17.1	8.9	0.2	26.2
10	Tritium Removal Facility	15.9			15.9
11	Continued Operations			17.7	17.7
12	Pickering B Refurbishment			0.0	0.0
13	**Total Stations**	302.1	172.9	296.8	771.8
	Operational Functions - Support				
14	Engineering				55.8
15	Projects & Modifications				5.4
16	Facilities Management				42.5
17	Programs & Training				193.3
18	- Records and Admin				23.8
19	- Nuclear Programs & Training				108.0
20	- Security				61.5
21	Supply Chain				67.0
22	Performance Improvement & Oversight				9.2
23	Inspection & Maintenance Services				31.2
24	Commercial Services				1.3
25	Waste & Transportation Services				5.0
26	Nuclear Level Common				9.9
27	**Total Support**	0.0	0.0	0.0	420.6
28	**Total Nuclear**	302.1	172.9	296.8	1,192.3

Numbers may not add due to rounding.

Table 6
Nuclear Base OM&A by Function ($M)
Budget - Calendar Year Ending December 31, 2010

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				595.0
2	- Operations	66.7	41.5	61.2	169.4
3	- Maintenance	107.1	63.5	123.3	293.9
4	- Fuel Handling	31.5	14.9	22.6	69.0
5	- Rad Protection, Chemistry & Envrnt	16.3	3.9	19.3	39.5
6	- Pickering Common Services		7.7	15.6	23.3
7	Station Engineering	27.6	22.7	27.3	77.5
8	Work Management	11.6	13.1	12.4	37.2
9	Support Services	14.3	8.6	3.7	26.6
10	Tritium Removal Facility	16.4			16.4
11	Continued Operations			9.8	9.8
12	Pickering B Refurbishment			1.2	1.2
13	**Total Stations**	291.5	175.9	296.3	763.7
	Operational Functions - Support				
14	Engineering				56.6
15	Projects & Modifications				7.6
16	Facilities Management				41.5
17	Programs & Training				191.5
18	- Records and Admin				25.3
19	- Nuclear Programs & Training				104.1
20	- Security				62.2
21	Supply Chain				67.0
22	Performance Improvement & Oversight				9.1
23	Inspection & Maintenance Services				30.8
24	Commercial Services				1.7
25	Waste & Transportation Services				4.8
26	Nuclear Level Common				12.6
27	**Total Support**	0.0	0.0	0.0	423.4
28	**Total Nuclear**	291.5	175.9	296.3	1,187.0

Numbers may not add due to rounding.

Table 7
Nuclear Base OM&A by Function ($M)
Actual - Calendar Year Ending December 31, 2009

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(f)
	Operational Functions - Station				
1	Operations & Maintenance				612.6
2	- Operations	69.6	42.7	61.5	173.8
3	- Maintenance	112.8	66.2	120.9	299.8
4	- Fuel Handling	28.8	17.7	24.2	70.7
5	- Rad Protection, Chemistry & Envrnt	19.6	4.5	21.6	45.8
6	- Pickering Common Services	0.0	7.4	15.1	22.5
7	Station Engineering	30.4	23.8	29.7	83.9
8	Work Management	11.5	14.9	12.1	38.5
9	Support Services	17.8	10.2	7.1	35.1
10	Tritium Removal Facility	17.7	0.0	0.0	17.7
11	Continued Operations			1.6	1.6
12	Pickering B Refurbishment			4.3	4.3
13	**Total Stations**	308.2	187.3	298.2	793.7
	Operational Functions - Support				
14	Engineering				59.9
15	Projects & Modifications				13.9
16	Facilities Management				41.8
17	Programs & Training				198.4
18	- Records and Admin				26.0
19	- Nuclear Programs & Training				110.8
20	- Security				61.6
21	Supply Chain				63.6
22	Performance Improvement & Oversight				8.5
23	Inspection & Maintenance Services				38.1
24	Commercial Services				1.5
25	Waste & Transportation Services				4.2
26	Nuclear Level Common				(7.1)
27	**Total Support**	0.0	0.0	0.0	422.8
28	**Total Nuclear**	308.2	187.3	298.2	1,216.5

Numbers may not add due to rounding.

Table 8
Nuclear Base OM&A by Function ($M)
Budget - Calendar Year Ending December 31, 2009

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				603.1
2	- Operations	73.3	44.7	62.4	180.4
3	- Maintenance	116.6	56.4	115.1	288.1
4	- Fuel Handling	27.7	15.9	23.8	67.4
5	- Rad Protection, Chemistry & Envrnt	17.6	3.1	19.6	40.3
6	- Pickering Common Services		8.9	18.0	26.9
7	Station Engineering	32.4	29.6	29.2	91.2
8	Work Management	12.1	14.7	11.2	38.0
9	Support Services	16.3	10.0	14.5	40.7
10	Tritium Removal Facility	18.9			18.9
11	Continued Operations			0.0	0.0
12	Pickering B Refurbishment			0.0	0.0
13	**Total Stations**	314.9	183.3	293.7	791.9
	Operational Functions - Support				
14	Engineering				65.0
15	Projects & Modifications				10.0
16	Facilities Management				41.9
17	Programs & Training				189.4
18	- Records and Admin				33.9
19	- Nuclear Programs & Training				90.4
20	- Security				65.1
21	Supply Chain				75.6
22	Performance Improvement & Oversight				29.9
23	Inspection & Maintenance Services				48.3
24	Commercial Services				3.5
25	Waste & Transportation Services				5.5
26	Nuclear Level Common				12.1
27	**Total Support**	0.0	0.0	0.0	481.3
28	**Total Nuclear**	314.9	183.3	293.7	1,273.2

Numbers may not add due to rounding.

Table 9
Nuclear Base OM&A by Function ($M)
Actual - Calendar Year Ending December 31, 2008

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				
2	- Operations	65.6	42.0	62.4	613.3
3	- Maintenance	117.3	69.4	116.5	170.0
4	- Fuel Handling	29.4	17.0	23.8	303.2
5	- Rad Protection, Chemistry & Envrnt	17.4	4.5	22.0	70.2
6	- Pickering Common Services		8.5	17.3	43.9
7	Station Engineering	33.1	26.9	31.0	25.9
8	Work Management	11.8	11.6	13.6	91.1
9	Support Services	16.0	7.7	19.9	37.0
10	Tritium Removal Facility	14.0			43.5
11	Continued Operations			0.0	14.0
12	Pickering B Refurbishment			9.0	0.0
13	**Total Stations**	304.7	187.6	315.6	9.0
					807.9
	Operational Functions - Support				
14	Engineering				62.4
15	Projects & Modifications				12.2
16	Facilities Management				38.4
17	Programs & Training				169.5
18	- Records and Admin				32.3
19	- Nuclear Programs & Training				84.6
20	- Security				52.6
21	Supply Chain				77.0
22	Performance Improvement & Oversight				29.5
23	Inspection & Maintenance Services				45.6
24	Commercial Services				1.4
25	Waste & Transportation Services				5.7
26	Nuclear Level Common				2.9
27	**Total Support**	0.0	0.0	0.0	444.5
28	**Total Nuclear**	304.7	187.6	315.6	1,252.4

Numbers may not add due to rounding.

Table 10
Nuclear Base OM&A by Function ($M)
Budget - Calendar Year Ending December 31, 2008

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				600.6
2	- Operations	71.6	43.3	61.1	176.0
3	- Maintenance	117.3	59.3	112.5	289.0
4	- Fuel Handling	27.0	15.2	23.0	65.3
5	- Rad Protection, Chemistry & Envrnt	16.6	3.2	21.9	41.8
6	- Pickering Common Services		9.4	19.1	28.5
7	Station Engineering	33.1	28.5	30.3	92.0
8	Work Management	13.1	12.7	12.4	38.3
9	Support Services	15.7	6.9	17.3	39.9
10	Tritium Removal Facility	16.7			16.7
11	Continued Operations			0.0	0.0
12	Pickering B Refurbishment			6.2	6.2
13	**Total Stations**	311.2	178.6	303.9	793.7
	Operational Functions - Support				
14	Engineering				64.9
15	Projects & Modifications				9.7
16	Facilities Management				39.5
17	Programs & Training				176.6
18	- Records and Admin				34.2
19	- Nuclear Programs & Training				87.2
20	- Security				55.3
21	Supply Chain				79.7
22	Performance Improvement & Oversight				29.4
23	Inspection & Maintenance Services				46.3
24	Commercial Services				3.5
25	Waste & Transportation Services				5.3
26	Nuclear Level Common				14.2
27	**Total Support**	0.0	0.0	0.0	469.0
28	**Total Nuclear**	311.2	178.6	303.9	1,262.7

Numbers may not add due to rounding.

Table 11
Nuclear Base OM&A by Function ($M)
Actual - Calendar Year Ending December 31, 2007

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				
2	- Operations	60.1	37.9	58.9	156.9
3	- Maintenance	122.3	58.7	111.2	292.2
4	- Fuel Handling	26.9	12.7	23.2	62.8
5	- Rad Protection, Chemistry & Envrnt	17.2	4.5	20.5	42.2
6	- Pickering Common Services	0.0	7.2	14.7	21.9
7	Station Engineering	29.8	27.4	30.8	88.0
8	Work Management	11.3	7.6	13.5	32.4
9	Support Services	14.1	6.5	14.6	35.2
10	Tritium Removal Facility	12.9	0.0	0.0	12.9
11	Continued Operations			0.0	0.0
12	Pickering B Refurbishment			23.3	23.3
13	**Total Stations**	294.6	162.5	310.7	767.9
	Operational Functions - Support				
14	Engineering				60.5
15	Projects & Modifications				10.7
16	Facilities Management				41.8
17	Programs & Training				160.1
18	- Records and Admin				33.5
19	- Nuclear Programs & Training				78.7
20	- Security				47.8
21	Supply Chain				80.2
22	Performance Improvement & Oversight				28.8
23	Inspection & Maintenance Services				37.7
24	Commercial Services				1.3
25	Waste & Transportation Services				4.8
26	Nuclear Level Common				11.1
27	**Total Support**	0.0	0.0	0.0	437.0
28	**Total Nuclear**	294.6	162.5	310.7	1,204.9

Numbers may not add due to rounding.

Table 12
Nuclear Base OM&A by Function ($M)
Budget - Calendar Year Ending December 31, 2007

Line No.	Function	Darlington NGS	Pickering A NGS	Pickering B NGS	Total
		(a)	(b)	(c)	(d)
	Operational Functions - Station				
1	Operations & Maintenance				585.2
2	- Operations	68.5	42.6	60.0	171.0
3	- Maintenance	114.5	53.2	115.2	282.9
4	- Fuel Handling	25.2	14.5	23.3	63.0
5	- Rad Protection, Chemistry & Envrnt	16.5	3.3	21.9	41.8
6	- Pickering Common Services		8.8	17.8	26.5
7	Station Engineering	32.1	28.3	33.6	94.0
8	Work Management	13.1	7.2	14.3	34.6
9	Support Services	15.7	11.4	15.7	42.8
10	Tritium Removal Facility	16.0			16.0
11	Continued Operations			0.0	0.0
12	Pickering B Refurbishment			21.6	21.6
13	**Total Stations**	301.6	169.3	323.2	794.1
	Operational Functions - Support				
14	Engineering				65.5
15	Projects & Modifications				7.8
16	Facilities Management				37.9
17	Programs & Training				167.0
18	- Records and Admin				32.9
19	- Nuclear Programs & Training				84.4
20	- Security				49.6
21	Supply Chain				84.4
22	Performance Improvement & Oversight				29.4
23	Inspection & Maintenance Services				37.5
24	Commercial Services				1.9
25	Waste & Transportation Services				5.2
26	Nuclear Level Common				14.0
27	**Total Support**	0.0	0.0	0.0	450.7
28	**Total Nuclear**	301.6	169.3	323.2	1,244.8

TAB 4

ONTARIO POWER GENERATION

889 Brock Road Pickering, ON L1W 3J2

February 18, 2010

NEC Members

Subject: Performance Targets for 2010-2014 Business Planning

As part of last year's business planning and benchmarking efforts, 19 performance measures with 2014 targets were identified. These targets were set to drive our organization towards reducing gaps and to meet our commitment to our shareholder and the people of Ontario of continuous performance improvement.

As a follow up, I am issuing the nuclear organization's 5-year targets for each of the 19 benchmarking targets (see attached). My expectation is that you provide your people with the direction, resources and support to address issues with new ideas so we can meet these targets. Teamwork will be essential between station and support organizations, including the peer teams, for success.

These 19 targets are integrated into our report card and AIPs, so we can monitor our effectiveness and keep our focus. Meeting these targets will be key to demonstrating how well we have done in running our business.

Wayne Robbins
Chief Nuclear Officer

OPG Nuclear Operations

Benchmarking Indicators - Targets	2010	2011	2012	2013	2014
Safety					
All Injury Rate (#/200k hours worked)	1.28	1.26	1.24	1.22	1.20
Industrial Safety Accident Rate* (#/200k hours worked)	0.15	0.15	0.15	0.15	0.15
Fuel Reliability* (micro-curies I131/g)	N/A	N/A	N/A	N/A	N/A
Reactor Trip Rate* (trips/7k hr critical)*	N/A	N/A	N/A	N/A	N/A
Auxiliary Feedwater System Unavailability* (#)	N/A	N/A	N/A	N/A	N/A
Emergency AC Power Unavailability* (#)	N/A	N/A	N/A	N/A	N/A
High Pressure Safety Injection Unavailability* (#)	N/A	N/A	N/A	N/A	N/A
Collective Radiation Exposure* (person rem/unit)	102.14	85.47	90.85	93.99	87.81
Airborne Tritium Emissions per Unit (Curies)	24,300	23,900	21,000	18,600	15,400
Reliability					
Nuclear Performance Index (%)	79.3	80.6	85.0	87.0	87.2
Forced Loss Rate* (%)	3.54	3.20	2.77	2.81	2.47
Unit Capability Factor* (%)	83.3	88.1	89.8	86.8	88.8
Chemistry Performance Indicator* (#)	1.05	1.04	1.04	1.03	1.03
On-line Elective Maintenance Backlog (work orders/unit)	380	337	318	290	261
On-line Corrective Maintenance Backlog (work orders/unit)	16	13	13	12	9
Value for Money					
Total Generating Costs per Net MWh ($/MWh)	49.41	46.86	47.10	52.28	51.22
Non-Fuel Operating Costs per Net MWh ($/MWh)	41.10	38.33	38.27	43.13	42.13
Fuel Costs per Net MWh ($/MWh)	4.32	4.77	5.15	5.33	5.36
Capital Costs per MW DER (k$/MW DER)	29.10	29.02	28.99	29.00	29.03

* Sub-indicator of WANO NPI

Darlington

Benchmarking Indicators - Targets	2010	2011	2012	2013	2014
Safety					
All Injury Rate (#/200k hours worked)	1.28	1.26	1.24	1.22	1.20
Industrial Safety Accident Rate* (#/200k hours worked)	0.15	0.15	0.15	0.15	0.15
Fuel Reliability* (micro-curies I131/g)	0.00050	0.00050	0.00050	0.00050	0.00050
Reactor Trip Rate* (trips/7k hr critical)*	0.50	0.50	0.50	0.50	0.50
Auxiliary Feedwater System Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Emergency AC Power Unavailability* (#)	0.0250	0.0250	0.0250	0.0250	0.0250
High Pressure Safety Injection Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Collective Radiation Exposure* (person rem/unit)	89.20	55.00	50.00	100.00	66.00
Airborne Tritium Emissions per Unit (Curies)	4,000	4,000	4,000	4,000	4,000
Reliability					
Nuclear Performance Index (%)	96.5	96.0	98.8	98.6	98.3
Forced Loss Rate* (%)	1.68	1.50	1.50	1.50	1.25
Unit Capability Factor* (%)	90.3	93.9	94.1	88.7	93.3
Chemistry Performance Indicator* (#)	1.01	1.01	1.01	1.01	1.01
On-line Elective Maintenance Backlog (work orders/unit)	275	250	235	225	214
On-line Corrective Maintenance Backlog (work orders/unit)	9	8	7	6	4
Value for Money					
Total Generating Costs per Net MWh ($/MWh)	36.83	35.70	36.69	43.52	40.08
Non-Fuel Operating Costs per Net MWh ($/MWh)	28.22	26.52	26.98	33.75	30.66
Fuel Costs per Net MWh ($/MWh)	4.24	4.66	5.02	5.16	5.21
Capital Costs per MW DER (k$/MW DER)	34.52	37.23	38.73	35.74	34.30

* Sub-indicator of WANO NPI

Pickering A

Benchmarking Indicators - Targets	2010	2011	2012	2013	2014
Safety					
All Injury Rate (#/200k hours worked)	1.28	1.26	1.24	1.22	1.20
Industrial Safety Accident Rate* (#/200k hours worked)	0.15	0.15	0.15	0.15	0.15
Fuel Reliability* (micro-curies I131/g)	0.00050	0.00050	0.00050	0.00050	0.00050
Reactor Trip Rate* (trips/7k hr critical)*	0.50	0.50	0.50	0.50	0.50
Auxiliary Feedwater System Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Emergency AC Power Unavailability* (#)	0.0250	0.0250	0.0250	0.0250	0.0250
High Pressure Safety Injection Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Collective Radiation Exposure* (person rem/unit)	120.52	147.00	189.00	120.00	130.00
Airborne Tritium Emissions per Unit (Curies)	11,500	11,500	9,000	7,000	6,000
Reliability					
Nuclear Performance Index (%)	60.3	61.6	68.1	73.6	76.8
Forced Loss Rate* (%)	8.00	7.00	5.00	5.00	4.00
Unit Capability Factor* (%)	73.7	82.6	85.3	84.8	86.8
Chemistry Performance Indicator* (#)	1.07	1.06	1.05	1.04	1.04
On-line Elective Maintenance Backlog (work orders/unit)	350	335	320	300	278
On-line Corrective Maintenance Backlog (work orders/unit)	10	10	10	10	9
Value for Money					
Total Generating Costs per Net MWh ($/MWh)	80.35	72.99	71.30	74.62	76.06
Non-Fuel Operating Costs per Net MWh ($/MWh)	70.12	63.37	62.38	64.63	65.78
Fuel Costs per Net MWh ($/MWh)	4.54	4.81	5.20	5.41	5.44
Capital Costs per MW DER (k$/MW DER)	36.56	34.63	27.74	33.85	36.63

* Sub-indicator of WANO NPI

Pickering B

Benchmarking Indicators - Targets	2010	2011	2012	2013	2014
Safety					
All Injury Rate (#/200k hours worked)	1.28	1.26	1.24	1.22	1.20
Industrial Safety Accident Rate* (#/200k hours worked)	0.15	0.15	0.15	0.15	0.15
Fuel Reliability* (micro-curies I131/g)	0.00050	0.00050	0.00050	0.00050	0.00050
Reactor Trip Rate* (trips/7k hr critical)*	0.50	0.50	0.50	0.50	0.50
Auxiliary Feedwater System Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Emergency AC Power Unavailability* (#)	0.0250	0.0250	0.0250	0.0250	0.0250
High Pressure Safety Injection Unavailability* (#)	0.0200	0.0200	0.0200	0.0200	0.0200
Collective Radiation Exposure* (person rem/unit)	105.90	85.18	82.63	74.98	88.53
Airborne Tritium Emissions per Unit (Curies)	8,800	8,400	8,000	7,600	5,400
Reliability					
Nuclear Performance Index (%)	71.7	74.8	79.7	82.0	81.2
Forced Loss Rate* (%)	5.00	4.50	4.00	4.00	4.00
Unit Capability Factor* (%)	76.1	81.0	84.7	84.4	81.9
Chemistry Performance Indicator* (#)	1.07	1.06	1.05	1.04	1.04
On-line Elective Maintenance Backlog (work orders/unit)	500	425	400	350	300
On-line Corrective Maintenance Backlog (work orders/unit)	25	20	20	20	15
Value for Money					
Total Generating Costs per Net MWh ($/MWh)	59.94	55.64	54.67	56.75	59.73
Non-Fuel Operating Costs per Net MWh ($/MWh)	53.14	48.95	47.54	49.12	51.87
Fuel Costs per Net MWh ($/MWh)	4.37	4.96	5.38	5.58	5.59
Capital Costs per MW DER (k$/MW DER)	16.15	12.25	13.03	15.12	16.25

* Sub-indicator of WANO NPI

TAB 5

Chart 1

Summary Comparison of 2008 OPG Nuclear Performance to Industry Benchmarks

Metric	Best Quartile	Median	Pickering A	Pickering B	Darlington
Safety					
All Injury Rate			0.73	0.96	1.04
2-Year Industrial Safety Accident Rate	0.05	0.09	0.14	0.07	0.04
2-Year Collective Radiation Exposure (man-rem per unit)	62.15	81.84	44.2	95.81	72.83
Airborne Tritium (TBq) Emissions per Unit	48.0	101.0	101.0	50.7	40.0
Fuel Reliability (microcuries per gram)	0.000001	0.000165	0.00059	0.00159	0.00025
2-Year Reactor Trip Rate (# per 7,000 hrs)	0.00	0.33	1.22	0.26	0.00
3-Year Auxiliary Feedwater System Unavailability	0.0014	0.0020	0.0119	0.0040	0.0017
3-Year Emergency AC Power Unavailability	0.0024	0.0076	0.0081	0.0091	0.0020
3-Year High Pressure Safety Injection Unavailability	0.0001	0.0037	0.0012	0.0001	0.0001
Reliability					
WANO NPI (Index)	96.19	62.46	60.84	60.93	95.67
2-Year Forced Loss Rate (%)	0.68	3.79	37.90	18.19	0.93
2-Year Unit Capability Factor (%)	90.97	84.31	56.6	73.17	91.99
2-Year Chemistry Performance Indicator (Index)	1.00	1.01	1.13	1.25	1.00
1-Year Online Elective Maintenance (work orders/unit)	218	278	425	695	311
1-Year Online Corrective Maintenance (work orders/unit)	4	7	14	28	11
Value for Money					
3-Year Total Generating Costs per MWh ($/Net MWh)	28.66	32.31	92.27	58.68	30.08
3-Year Non-Fuel Operating Costs per MWh ($/Net MWh)	18.06	21.28	82.62	50.95	25.10
3-Year Fuel Costs per MWh ($/Net MWh)	5.02	5.37	2.64	2.68	2.62
3-Year Capital Costs per MW DER	32.79	46.22	32.07	32.44	18.79

KEY: Green = best quartile performance/max NPI points achieved if applicable
White = 2nd quartile performance
Yellow = 3rd quartile performance
Red = lowest quartile performance

Numbers may not add due to rounding.

Table 1
Operating Costs Summary - Nuclear ($M)

Line No.	Cost Item	2007 Actual	2008 Actual	2009 Actual	2010 Budget	2011 Plan	2012 Plan
		(a)	(b)	(c)	(d)	(e)	(f)
	OM&A:						
1	Base OM&A	1,204.9	1,252.4	1,216.5	1,187.0	1,192.3	1,219.8
2	Project OM&A	111.6	136.5	143.7	143.8	135.9	132.2
3	Outage OM&A	215.6	196.1	254.8	284.6	214.8	201.1
4	Subtotal	1,532.0	1,585.0	1,615.0	1,615.5	1,543.0	1,553.2
5	Generation Development OM&A	11.8	34.1	79.5	40.5	5.9	4.5
6	Allocation of Corporate Costs	240.7	237.6	234.5	247.0	249.2	252.3
7	Allocation of Centrally Held Costs	210.2	132.2	58.8	171.0	199.0	234.3
8	Asset Service Fee	33.2	28.8	27.2	24.6	24.1	23.7
9	Total OM&A	2,027.9	2,017.7	2,015.0	2,098.6	2,021.2	2,067.9
10	Nuclear Fuel Costs	113.0	149.9	172.6	201.9	235.6	261.7
	Other Operating Cost Items:						
11	Depreciation and Amortization[1]	300.7	301.0	319.8	209.6	235.4	256.4
12	Income Tax	0.0	0.0	45.0	0.0	53.9	75.9
13	Capital Tax	7.9	7.8	7.7	2.9	N/A	N/A
14	Property Tax	8.2	15.0	14.2	15.0	16.0	16.6
15	Total Operating Costs	2,457.6	2,491.3	2,574.3	2,528.1	2,562.2	2,678.5

Notes:
1 Includes nuclear waste management variable expenses.

TAB 6

PWU Interrogatory #019

Ref: (a): Ex. F2-T1-S1, Attachment 3, page 2
(b): Ex. F5-T1-S2, schedule 2, page 10 of 64
(c): Ex. F5-T1-S1, schedule 1, page 88 of 158

Issue Number: 6.4
Issue: Is the benchmarking methodology reasonable? Are the benchmarking results and targets flowing from those results for OPG's nuclear facilities reasonable?

Interrogatory

a) Please indicate if the Bruce CANDU units included in the benchmark study have new boilers.

b) Would new boilers be expected to improve plant performance?

c) Please indicate how the benchmarking was used to set the top-down OMA and capital targets issued by the Chief Nuclear Operator in a manner that ensures consistency with safety and performance metrics.

d) Ref (a) shows a table outlining the technology differences between OPG's units and other nuclear technologies.

Please provide your estimates of the qualitative and quantitative adjustments to the benchmarking that should be done to reflect the differences in staffing requirements between CANDU units and BWR and PWR units.

e) Ref (b) states:

> It should be noted that OPG's financial and operational performance relative to its peers is impacted by differences in design technology, the number of reactors onsite, the geographic size of the site, reactor age, and operational condition in addition to low capability factors at both the Pickering A and Pickering B sites.

What is the effect of the following variables on the comparative non-fuel $/MWh in the gap analysis:

i) Generator output in MW.
   1. How does unit size impact the maintenance effort per MW?
   2. Please provide your estimates of the effect of unit size on $/MWh performance metrics.
   3. What corrections were applied to the analysis and/or results of the ScottMadden benchmarking study to reflect this scaling?

Witness Panel: Nuclear Benchmarking & Business Planning

ii) The number of units per station.
   1. How does the number of units impact the maintenance effort per MW?
   2. What corrections were applied to the analysis and or results of the ScottMadden benchmarking to reflect this scaling?
   3. Please provide the size of the units and the corresponding number of all the units included in the ScottMadden benchmarking study together with their non-fuel $/MWh.

iii) What is the impact of the number of steam generators (12 per unit at Pickering, 4 per unit at Darlington, vs. 8 per unit at Bruce, 2-4 units at PWR plants, 0 units at BWR plants) and on maintenance efforts per MW.

iv) Collectively the main coolant pumps (40 per unit at Pickering vs. 4 per unit at Darlington, 2-4 units for PWR and 2 units for BWR Units); the large isolation valves (40/unit at Pickering, 0 at Darlington and 0 for PWR, 2 for BWR units); and the fueling machines.

v) The carbon steel in the CANDU reactors heat transport system vs. stainless steel in the BWR and PWR reactors. Please indicate the influence of this on the non-fuel $/MWh benchmarking.

vi) The reactor age and resulting mitigation of the accumulated and ongoing deterioration in plant components including boilers, calandria tubes and pressure tubes and feeders.

   1. Please provide the maintenance and inspection cost and the number of planned and forced outage days attributable to these components for each of OPG's nuclear plants in the past decade.
   2. What is the contribution of inspection and maintenance efforts related to these and other components to the benchmark comparison with CANDU and with BWR and PWR reactors?

vii) The number of pressure tubes.

viii) Other variables (e.g., special circumstances, such as the requirement to maintain an electrical connection between Pickering B and Pickering A).

f) Ref (c) states:

> For the review period, approximately 7% of the Pickering A FLR was attributable to human performance, 42% to equipment reliability, and 51% percent to design basis.

Please confirm that based on the OPG and Bruce CANDU units, CANDU technology requires significantly higher staffing levels in comparison with BWR and PWR per MW.

Response

a) None of the operating Bruce Nuclear Generating Station units have new boilers. Only Bruce Units 1 and 2 that are currently being refurbished have had new boilers installed. These units are not yet operating and so are not part of the benchmarking study.

b) Yes, in that new boilers will not suffer from performance degradation due to fouling (which can reduce operating margins) and will have fewer active degradation mechanism requiring inspection and maintenance activities during planned outages.

c) OPG compared itself against its industry peers on 19 benchmarks to set targets in both financial and operational performance areas. The expectation is that OPG Nuclear will continue to perform better than its industry peers in safety metrics, as the safety of OPG's employees, the public and the environment is the overarching focus. Reliability and financial performance targets were set based on the need to narrow the identified performance gaps.

d) OPG does not have an estimate of the quantitative and qualitative adjustments that should be made to the benchmarking results to account for differences in staffing requirements between CANDU units and BWR and PWR units.

e) i) 1. No analysis was conducted on the impact of unit size on maintenance efforts.
2. No formal benchmarking was done on the impact of size on the $/MWh targets. However, Darlington Generating Station's large unit sizes and Pickering A and B Generating Stations' much smaller unit sizes impacts the $/MWh costs scenarios. It is OPG's opinion that these are reflected in the Non-Fuel $/MWh targets for all three stations where the Pickering Generating Station would be challenged to reach median performance, but Darlington Generating Station's is targeting to reach best quartile performance.
3. Neither the benchmarking analysis nor the results were adjusted for unit size.

ii) 1. No analysis was conducted on how the number of units impacts on maintenance efforts.
2. Neither the benchmarking analysis nor the results were adjusted for number of units.
3. See Attachment 1.

iii) No benchmarking analysis was conducted on the number of steam generators.

iv) No benchmarking analysis was conducted on the main coolant pumps.

v) No benchmarking analysis was conducted comparing carbon steel and stainless steel in heat transport systems.

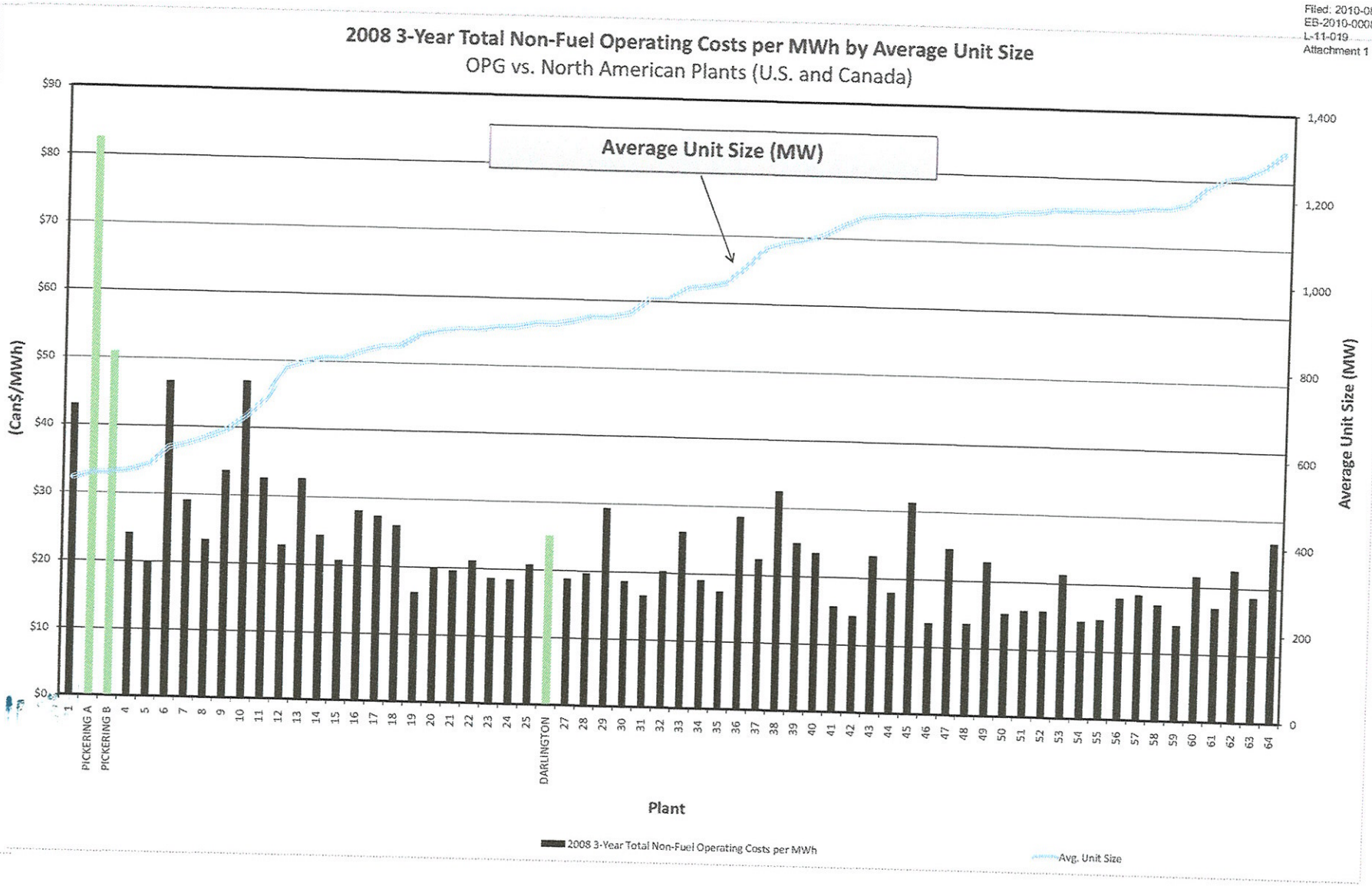
vi) No benchmarking analysis was conducted on this subject matter.

Witness Panel: Nuclear Benchmarking & Business Planning

vii) No benchmarking analysis was conducted on the number of pressure tubes.

viii) No benchmarking analysis was conducted on other variables.

f) ScottMadden performed a preliminary review of the comparison between CANDU technology and North American industry peers as a driver of performance gaps for non-fuel operating costs per MWh (Ex. F5-T1-S1, page 124 of 158), but was unable to quantify the impact on the benchmark data. This information was not included in the final 2009 Benchmarking Report. As a result, OPG cannot confirm that CANDU technology requires significantly higher staffing levels per MW in comparison with BWR and PWR.


2008 3-Year Total Non-Fuel Operating Costs per MWh by Average Unit Size
OPG vs. North American Plants (U.S. and Canada)
Average Unit Size (MW)
(Can$/MWh)
Average Unit Size (MW)
$90
$80
$70
$60
$50
$40
$30
$20
$10
$0
1,400
1,200
1,000
800
600
400
200
0
PICKERING A
PICKERING B
DARLINGTON
Plant
2008 3-Year Total Non-Fuel Operating Costs per MWh
Avg. Unit Size

TAB 7

ATTACHMENT 3

Key Drivers of Total Generating Costs

OPG Nuclear business planning has historically been driven by certain key factors that drive costs, many of which are unique to CANDU (Canadian Deuterium Uranium) operations:

Complexity: Nuclear plants are technologically sophisticated facilities, with a large number of safety and process systems, and a high level of redundancy for critical components within the plant. In addition to the complexity inherent in boiling or pressurized water reactors, on-line refueling and functions associated with heavy water management add significantly to the cost and complexity of CANDU operations.

There are numerous differences between CANDU and other reactors that result in different costs. Of the world reactor fleet of 436 units, 265 or 61 per cent are pressurized water reactors. Ninety-two or 21 per cent are boiling water reactors, and 39 or 9 per cent are CANDU type. The remaining units are mainly gas cooled reactors. Some of the most significant technological differences driving costs are noted here.

Technology Differences between CANDU and Pressurized Water Reactors/Boiling Water Reactors

Components	Pickering A	Pickering B	Darlington	Pressurized Water Reactor	Boiling Water Reactor
Reactor	Horizontal pressure tubes	Horizontal pressure tubes	Horizontal pressure tubes	Pressure vessel	Pressure vessel
Reactor coolant and associated systems	Heavy water	Heavy water	Heavy water	Light water	Light water
Generator Output	540MW	540MW	934MW	500-1400 MW	500 – 1400 MW
Steam Generators (SG)/unit	12	12	4	2 - 4	NA
Main Coolant Pumps/unit	16	16	4	2 - 4	2
Large Isolation Valves Main Circuit	40/unit	40/unit	0	0	4/unit
Standby Generators & Emergency Power Generator	6 for 4 units	8 for 4 units	6 for 4 units	2/unit	2/unit
Computers/unit	2	2	8	1	1
Shut Down Systems/unit	2	2	2	2	2
On line Fuelling Machines	8 for 4 units	8 for 4 units	6 for 4 units	NA	NA
Tritium Removal Facility	0	0	1	NA	NA
Heat Transport System	Carbon steel	Carbon steel	Carbon steel	Stainless steel	Stainless steel

- **Generation Technology:** OPG's nuclear stations contain the first large-scale commercial CANDU units ever built, the result being that many of the technological issues OPG faces are being addressed for the first time in the nuclear industry. Addressing issues affecting critical components such as steam generators, feeder pipes, and pressure tubes has demanded and will continue to demand extensive effort. This work includes high cost maintenance activities such as the feeder replacement program,

and preservation of fuel channels through restoration of spacing margin to prevent deterioration (spacer location and relocation program). Aging technology also drives OPG's ongoing investment in research and development programs. To the greatest extent possible, life cycle plans for all major components assist in ensuring fitness for service.

- **Safety and Regulatory:** OPG must ensure that the stations are operated and maintained safely at all times, and remain safe even when non-operational. For example, even when a unit is shut down, nuclear fuel continues to produce heat that must be removed.

  The requirement to meet nuclear safety regulations and standards imposed by the federal *Nuclear Safety and Control Act*, and the need to satisfy OPG's nuclear regulator, the CNSC, as described in Ex A1-T6-S1, drives a large number of ongoing work activities and costs. These include scheduled "periodic inspections" of specified equipment, in-depth analysis and assessments of systems, systems operations and component conditions, and preventive and remedial activities. In addition to ongoing activities, there is also extensive effort for re-licensing of each station every five years and the potential of additional requirements and costs associated with the license renewal.

  While nuclear safety is an obvious driver of maintenance and monitoring activities and therefore of costs, there has also been a trend in recent years for the CNSC to mandate changes to organizations and facilities to address changing requirements in such areas as physical security and fire protection.

- **Training:** A further consequence of complexity is that OPG must hire staff with special skills that require extensive and ongoing training. The following provides an example of the impact of training in the critical area of nuclear operators obtaining their station-specific certification:
  - Non-licensed Operators: When a new field operator is hired, it typically takes approximately two years of training before the operator is able to perform work in the station. At this point, the non-licensed operator is able to work independently, but may still be required to work alongside an experienced operator for sensitive activities.

- Licensed Operators: As opposed to the field-based non-licensed operators, licensed operators are authorized to physically operate the station within the main control room. Certification to become a fully authorized nuclear operator typically requires two to six years of field work as a trained operator, followed by four to five years of study and regulatory examination, to be allowed to operate as a unit panel operator on an independent basis. Certification further requires ongoing training (generally, one week out of five).

- **Material Standards:** Equipment in a nuclear station can be subjected to demanding conditions on an ongoing basis and may be required to operate in a harsh environment (e.g., steam environment, increased radiation, high temperature and pressure or seismic acceleration) under postulated accident conditions. The harsh environment not only necessitates more frequent maintenance or replacement of parts, but also requires tightly-specified replacement parts that are environmentally-qualified for operations under such conditions, and detailed maintenance procedures to ensure that such qualification is not inadvertently compromised. Supply Chain must create and maintain the infrastructure to identify and audit vendors who can meet the stringent requirements from both a technical and quality assurance program standpoint, complying with all applicable codes and standards. "Cradle to grave" traceability (from the material manufacturer of record, to the exact end use location within the station along with the qualifications of all staff who handled the item while in process), is an example of the very costly process that is required for many components.

- **Work Environment:** In addition to the direct impact on materials costs and demanding maintenance procedures as noted above, work environment (primarily radiation) also constrains labour productivity, since maintenance in some physical locations of the nuclear plant requires both protective procedures and equipment (e.g., the wearing of cumbersome plastic suits, with dedicated breathing air). Furthermore, within and outside radiation areas, labour productivity is significantly impacted by the need for:
  - Stringent security procedures required of all staff prior to entering protected areas of the plant (such as badging, security clearances, and metal detection).

- Turnover communications/pre-job briefing for all staff, including procedure review for the specific job at hand.
- Obtaining radiation protection approvals, and adjusting protective equipment or receiving additional briefing as required.
- Having equipment physically taken out-of-service, or appropriately isolated, such that work can proceed safely.

TAB 8

SEC Interrogatory #026

Ref: Ex. F2-T2-S1, page 5, A, Table 1

Issue Number: 6.4
Issue: Is the benchmarking methodology reasonable? Are the benchmarking results and targets flowing from those results for OPG's nuclear facilities reasonable?

Interrogatory

Please calculate the OM&A reduction that would be required for the Darlington GS in order to maintain the 2008 non-fuel benchmark of $25.10 MWh.

Response

The 2008 non-fuel benchmark of $25.10/MWh for Darlington Generating Station is based on a three year average while the targets of $28.22, $26.52 and $26.98 for 2010 - 2012 in Ex. F2-T1-S1, Attachment 8 are based on annual performance.

The Interrogatory references Ex. F2-T2-S1, Table 1 which is Base OM&A only whereas the non-fuel benchmark includes Total OM&A including all operating costs such as Project OM&A and Corporate Support that are outside the Base OM&A table.

In order to maintain the non-fuel benchmark of $25.10/MWh, and given the generation plan for the years in question, the following Total OM&A (including Station, Nuclear Support, Projects and Corporate Support) reduction would be required:

	2010	2011	2012
Non-Fuel Operating Costs Target ($/MWh)	28.22	26.52	26.98
Net Electrical Production Target (TWh)	27.74	28.86	29.00
Required Non-Fuel Operating Costs Reduction ($M)	**86.61**	**40.89**	**54.62**
Non-Fuel Operating Costs Revised ($/MWh)	25.10	25.10	25.10

TAB 9

SEC Interrogatory #029

Ref: Ex. F2-T1-S1, Attachment 8, Darlington Benchmark Targets

Issue Number: 6.5
Issue: Has OPG responded appropriately to the observations and recommendations in the benchmarking report?

Interrogatory

The targeted benchmark for Total Generating Costs per Net MWh, is $35.70 and $36.69 for 2011 and 2012 for the Darlington GS. Please provide the rationale for selecting benchmarks approximately 19% above 22% above the achieved benchmark for Darlington in 2008? Please also provide the inflation assumptions that were used to set the 2011 and 2012 benchmarks.

Response

The actual Total Generating Costs/MWh in 2008 for Darlington was $31.56, and excludes Other Post Employment Benefit ("OPEB") costs. The Electric Utility Cost Group ("EUCG") database from which this value is taken excludes OPEB costs when calculating Total Generating Cost. OPG's targeted Total Generating Costs/MWh benchmark for Darlington for 2011 and 2012 of $35.70 and $36.69 includes OPEB costs for business planning. To provide a more appropriate and accurate comparison, the target Total Generating Costs/MWh for 2011 and 2012 excluding OPEB costs is $34.21 and $35.14. The annual targets set for 2011 and 2012 are therefore 8.4 per cent and 11.3 per cent higher than the 2008 performance, not 19 per cent and 22 per cent.

The annual targets for 2011 and 2012 were set above the performance achieved in 2008 to recognize industry inflation. As explained below, the overall industry inflation assumption is for Total Generating Costs to increase by approximately 4 per cent per annum. Darlington's projected increase of 8.4 per cent over three years and 11.33 per cent over four years is therefore reasonable when benchmarked against these industry projections.

During the target setting process (Ex. F2-T1-S1, page 13) industry "inflation" assumptions were derived by ScottMadden and applied to the 2014 industry targets based on historical escalation rates derived from the Electric Utility Cost Group ("EUCG") database. Industry Non-fuel costs were escalated approximately 4.5 per cent per annum, fuel costs by 7.2 per cent per annum, and capital costs by 1.33 per cent per annum based on the EUCG historical data. This equates to an annual increase in Total Generating Costs of approximately 4 per cent.

The four components that make up Total Generating Costs (Total Non-fuel Operating Costs; Fuel Costs; Capital Costs and Net Electrical Production) and their respective 2008, 2011 and

2012 amounts for Darlington Generating Station can be found in the table below. As shown in the table, Total Non-fuel Operating Costs, Fuel Costs and Capital Costs are increasing, while Net Electrical Production is flat.

Total Non-fuel Operating Costs consist of station costs (inclusive of Nuclear support costs), corporate cost allocations and pension burden costs. For these items, Darlington Generating Station's costs are targeted to reduce from the 2008 levels by 9 per cent and 7 per cent in 2011 and 2012, respectively, offset by increases in corporate cost allocations and pension burden costs. Fuel costs from inventory are projected to increase as discussed in Ex. F2-T5-S1. The increase in Darlington Generating Station capital costs is based on an increase projected allocation from the fixed capital portfolio and align with the assumption that more capital will be invested in Darlington Generating Station as it ages and less in Pickering Generating Station as it nears its end of life (see Ex. L-11- 015).

Darlington	2008	2011	2012
Total Non-Fuel Operating Costs (k$) [Note 1]	718,895	722,186	737,420
Fuel Costs (k$)	91,080	134,426	145,646
Capital Costs (k$)	101,887	130,757	136,014
Total Generating Costs (k$)[1]	911,862	987,370	1,019,081
Net Electrical Production Target (TWh)	28.89	28.86	29.00
Total Non-Fuel Operating Costs per Net MWh ($/MWh)[1]	$ 24.88	$ 25.02	$ 25.43
Fuel Costs per Net MWh ($/MWh)	$ 3.15	$ 4.66	$ 5.02
Capital Costs per MW DER (k$/MW DER)	$ 29.01	$ 37.23	$ 38.73
Total Generating Costs per Net MWh ($/MWh)[1]	$ 31.56	$ 34.21	$ 35.14

Note 1: Excludes OPEB costs

TAB 10

Attachment 4

Forecast for Major Unforeseen Events

This attachment describes the derivation and rationale for the 2.0 TWh forecast for major unforeseen events described in section 3.5.

On average from 2005 to 2008, OPG's actual nuclear production has been less than the approved business plan forecast by approximately 3.5 TWh. An analysis undertaken in 2009 revealed that these unplanned variances were largely the result of high forced loss rates due to major unforeseen events (2.05 TWh, on average) and forced extensions to planned outages (1.19 TWh, on average) (Table 1). Examples of major unforeseen events include losses due to feeder thinning (2005); the inter-station transfer bus issue (2007); the resin release issue (2007) and calandria tube deterioration (2008).

Table 1

Average TWh Variance to Business Plan, 2005 to 2008

Station	Planned Outage Variances	Forced Losses		Forced Extension to Planned Outages		Other Losses[1]	Total Average Variance
		Major Unforeseen Events	Balance	Major Unforeseen	Balance		
Pickering A	0.41	-1.18	-0.51	0.00	-0.27	0.04	-1.51
Pickering B	0.11	-0.87	-0.05	-0.09	-0.64	-0.17	-1.71
Darlington	-0.12	0.00	0.54	0.00	-0.28	-0.45	-0.30
Total Fleet	0.39	-2.05	-0.02	-0.09	-1.19	-0.57	-3.52

A forecast for major unforeseen events was not included in the nuclear generation forecast presented in EB-2007-0905. For the 2010 - 2014 Business Plan, a forecast of generation

[1] Other losses are comprised of grid losses, net lake losses and consumption (i.e. station operating and outage)

losses due to major unforeseen events has been included in the nuclear production forecast. This reflects OPG's recent actual experience as well as OPG's expectation that there will be future production losses due to these major unforeseen events. The average amount (2.0 TWh) incurred over the last 4 years is considered a realistic projection of the expected losses.

The adjustment to the nuclear production forecast of 2 TWh for major unforeseen events results in a more accurate and reasonable production forecast for OPG.