

EB-2016-0160

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act 1998*,
Schedule B to the *Energy Competition Act*, 1998, S.O. 1998, c.15;

AND IN THE MATTER OF an Application by Hydro One
Networks Inc. for an Order or Orders approving or fixing just and
reasonable rates and other service charges for the transmission of
electricity as of January 1, 2017 and January 1, 2018.

**CROSS-EXAMINATION COMPENDIUM OF THE
SCHOOL ENERGY COALITION
(Execution, Operating, and Common Panel)**

December 6, 2016

Ontario Energy Board	
FILE No.	EB-2016-0160
EXHIBIT No.	K 9.3
DATE	
08/99	

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Exhibit I, Tab 06, Schedule 20, Attachment 1

		Historic		Bridge	Test		Source	
		2014	2015	2016	2017	2018		
1								
2								
3	Transformer Portfolio							
4		# Replacements	26	26	26		III/iii/D1/2/1, p.15	
5	EB-2014-0140	% of Fleet	3.6%	3.6%	3.6%			
6		Capital (\$M)	162.9	105.7	120.1			
7		OM&A (\$M)	23.3	23.7	22.8			
8								
9	EB-2016-0160	# Replacements	24	21	19	27	22	B1/2/6, p.9 (Table 3)
10		% of Fleet	3.3%	2.9%	2.6%	3.7%	3.1%	
11		Capital (\$M)	132.0	115.5	104.5	148.5	121.0	
12		OM&A (\$M)	24.1	20.0	20.7	24.7	22.4	
13								
14	Circuit Breaker Portfolio							
15		# Replacements	125	150	147			III/iii/D1/2/1, p.24
16	EB-2014-0140	% of Fleet	2.7%	3.3%	3.2%			
17		Capital (\$M)	68.9	82.7	83.2			
18		OM&A (\$M)	17.3	19.4	19.8			
19								
20	EB-2016-0160	# Replacements	83	31	43	66	132	B1/2/6, p.17 (Table 5)
21		% of Fleet	1.8%	0.7%	0.9%	1.5%	2.9%	
22		Capital (\$M)	58.1	21.7	30.1	46.2	92.4	
23		OM&A (\$M)	20.2	23.4	18.7	19.4	18.9	
24								
25	Protection Systems Portfolio							
26		# Replacements	350	365	450			III/iii/D1/2/1, p.36
27	EB-2014-0140	% of Fleet	2.9%	3.0%	3.7%			
28		Capital (\$M)	56.3	57.9	70.5			
29		OM&A (\$M)	10.6	10.3	11.7			
30								
31	EB-2016-0160	# Replacements	610	266	367	449	528	B1/2/6, p.29 (Table 8)
32		% of Fleet	5.0%	2.2%	3.0%	3.7%	4.4%	
33		Capital (\$M)	76.3	33.3	45.9	56.1	66.0	
34		OM&A (\$M)	8.8	8.5	9.5	10.3	10.5	
35								
36	Conductor Portfolio							
37		Replacements (km)	113	99	60			III/iii/D1/2/1, p.43
38	EB-2014-0140	% of Fleet	0.4%	0.3%	0.2%			
39		Capital (\$M)	33.2	36.8	29.3			
40		OM&A (\$M)	13.1	14.2	14.5			
41								
42	EB-2016-0160	Replacements (km)	93	201	183	192	440	B1/2/6, p.36 (Table 9)
43		% of Fleet	0.3%	0.7%	0.6%	0.6%	1.5%	
44		Capital (\$M)	40.7	58.4	76.9	67.1	143.1	
45		OM&A (\$M)	6.7	6.2	6.8	7.0	7.1	
46								
47	Wood Pole Portfolio							
48		# Replacements	850	850	850			III/iii/D1/2/1, p.50
49	EB-2014-0140	% of Fleet	2.0%	2.0%	2.0%			
50		Capital (\$M)	27.2	27.7	28.2			
51		OM&A (\$M)	4.4	4.1	4.2			
52								
53	EB-2016-0160	# Replacements	897	845	850	850	850	B1/2/6, p.43 (Table 10)
54		% of Fleet	2.2%	2.0%	2.0%	2.0%	2.0%	
55		Capital (\$M)	43.6	38.5	38.3	35.3	35.3	
56		OM&A (\$M)	6.7	6.2	6.8	7.0	7.1	
57								
58								
59								
60	Steel Structure Portfolio							
61		# Refurbishments	350	350	400			
62		# Replacements	4	4	12			III/iii/D1/2/1, p.58
63	EB-2014-0140	% of Fleet	0.7%	0.7%	0.8%			
64		Capital (\$M)	11.1	10.7	16			
65		OM&A (\$M)	4.4	4.1	4.2			
66								
67	EB-2016-0160	# Renewal	121	300	462	1250	1600	B1/2/6, p.54 (Table 11)
68		% of Fleet	0.2%	0.6%	0.9%	2.4%	3.1%	
69		Capital (\$M)	5.1	4.6	8.8	42.5	54.4	
70		OM&A (\$M)	6.2	5.7	6.3	6.3	6.4	
71								
72	Underground Cable Portfolio							
73		Replacements (km)	5	5.5	2			III/iii/D1/2/1, p.67
74	EB-2014-0140	% of Fleet	1.7%	1.9%	0.7%			
75		Capital (\$M)	19.4	28.1	15.1			
76		OM&A (\$M)	4.4	4.8	4.9			
77								
78	EB-2016-0160	Replacements (km)	3.1	0	0	0	4.8	B1/2/6, p.66 (Table 13)
79		% of Fleet	1.1%	0.0%	0.0%	0.0%	1.8%	
80		Capital (\$M)	20.6	3.5	1.4	2.3	22.5	
81		OM&A (\$M)	4.0	4.1	5.0	5.1	5.2	
82								

1 *Association of Major Power Consumers in Ontario (AMPCO)*
2 *INTERROGATORY #052*
3

4 *Reference:*

5 Exhibit B1 Tab 4 Schedule 1 Pages 15 to 16
6

7 *Interrogatory:*

- 8 a) Please provide the portion of the total capital plan completed externally compared to
9 internally for the years 2010 to 2018.
10
11 b) Please provide Hydro One's assumptions in the budget for 2017 and 2018 regarding the % of
12 work undertaken by internal resources.
13
14 c) Please provide the % of work contracted out on a fixed-price basis for the years 2015 to
15 2018.
16
17 d) Please provide the % of line refurbishment capital work that will be done by external
18 resources in 2017 and 2018 compared to 2015.
19

20 *Response:*

- 21 a) The chart below represents total contracted costs for 2012 – 2016.
22

2012	2013	2014	2015	2016	2017	2018
12%	13%	11%	11%	11%	14-18%*	16-20%*

23
24 *2017/2018 values are based on assumptions and not actual contract awards. They are
25 subject to the execution model (ePC, PC, C, etc.) and market response.
26

- 27 b) Hydro One's assumption is that 70-80% of the work program will be completed by internal
28 resources. In Construction Services our resource pool is provided through casual trades. The
29 expectation is that the internal resource pool will remain flat at current levels and the
30 majority of the increased work program will be constructed using external resources.
31
32 c) Hydro One's present contracting model to date has been "fixed price". Other contracting
33 models are currently being explored to determine if this will result in increased cost
34 efficiencies for rate payers.

1 d) In 2015 the entire lines sustainment work program was accomplished using internal resources
2 (casual trades BTU and Provincial Lines PWU staff). In 2017/2018 10-15% of the lines
3 refurbishment work program is expected to be outsourced. For the work executed by
4 Provincial Lines 70% of the work is performed by full time PWU staff. The remaining 30%
5 is augmented through use of the PWU Hiring Hall. If the PWU Hiring Hall is unable to
6 provide adequate resources, Hydro One would then explore Purchased Services Agreement
7 with the PWU in order utilize external contractors.

In-Service Capital Additions 2013 – 2018 (S Millions)										
	EB-2012-0031				EB-2014-0140				EB-2016-0140	
	2013	2013	2014	2014	2015	2015	2016	2016	2017	2018
	OEB Approved	ISA Actuals	OEB Approved	ISA Actuals	OEB Approved	ISA Actuals	OEB Approved	Bridge Projected	Req	Req
Sustaining (\$M)	443.3	403.8	588.4	655.8	572.2	569.7	480.9	604.5	771.1	747.7
Development (\$M)	261.8	231.7	177.3	177.9	134.7	27.9	119.4	209.5	64.6	374.9
Operations (\$M)	15.1	5.9	14.7	12.1	50.4	29.4	10.0	15.1	8.0	10.3
Common & Other (\$M)	64	62.4	82.9	68.7	64.1	72.2	63.1	82.6	87.8	76.8
Total ISA (\$M)	784.2	703.8	863.3	914.5	821.3	699.1	673.3	911.7	931.4	1209.7
Sustaining (\$M)	443.3	403.8	588.4	655.8	572.2	569.7	480.9	604.5	771.1	747.7
Actuals v. Approved (\$M)	-39.5		67.4		-2.5		123.6			
Actual v. Approved (%)	-8.91%		11.45%		-0.44%		25.70%			
Actuals v. Approved (\$M)	27.9				121.1					
Actual v. Approved (%)	2.70%				11.50%					
Total ISA (\$M)	784.2	703.8	863.3	914.5	821.3	699.1	673.3	911.7	931.4	1209.7
Actuals v. Approved (\$M)	-80.4		51.2		-122.2		238.4			
Actual v. Approved (%)	-10.25%		5.93%		-14.88%		35.41%			
Actuals v. Approved (\$M)	-29.2				116.2					
Actual v. Approved (%)	-1.77%				7.77%					

Data source: AMPCO #47

Ontario Energy Board (Board Staff) INTERROGATORY #106

Reference:

Exhibit A/Tab 3/Sch1– Section 4: Transmission System Plan, pg. 13

Investment Category	EB-2014-0140		EB-2016-0160		Comparison between Filings	
	2017	2018	2017	2018	2017 Increase	2018 Increase
Sustaining	597.4	636.7	776.8	842.1	30.0%	32.3%
Development	148	116.4	196.4	170.2	32.7%	46.2%
Operations	44.4	25.2	25.4	30.8	-42.8%	22.2%
Common Corp Costs	58	60.4	77.6	79.1	33.8%	31.0%
Total Capital	847.8	838.7	1076.1	1122.2	26.9%	33.8%

Interrogatory:

a) Please confirm the following:

- i) that the forecast sustaining capital expenditures in Test Years 2017 & 2018 are 30% and 32.3% higher than the corresponding Hydro One forecasts for sustaining capital expenditures in those years in the 2014 EB-2014-0140 filing.
- ii) that the forecast development capital expenditures in Test Years 2017 & 2018 are 32.7% and 46.2% higher than the corresponding Hydro One forecasts for development capital expenditures in those years in the 2014 EB-2014-0140 filing.
- iii) that the forecast operations capital expenditures in Test Years 2017 & 2018 are 42.8% lower and 32.3% higher respectively than the corresponding Hydro One forecasts for operations capital expenditures in those years in the 2014 EB-2014-0140 filing.
- iv) that the forecast common corporate capital expenditures in Test Years 2017 & 2018 are 33.8% and 31% higher than the corresponding Hydro One forecasts for development capital expenditures in those years in the 2014 EB-2014-0140 filing.

b) Given the magnitude of these changes, please explain if Hydro One has obtained sources of material new information or changed evaluation methodologies between preparation of the 2014 application and this application.

Witness: Chong Kiat Ng/Glenn Scott

1 i) If a result of new information, please explain why this information was not available
2 to Hydro One at its last application.

3
4 ii) If as a result of new methodology, please explain what benefits this new methodology
5 will produce to justify the additional costs.

6
7 **Response:**

8 a) and b) See Hydro One's responses below.

9
10 i) The increases described above for Sustainment capital forecasts are confirmed. They reflect
11 new information regarding customer needs and preferences, reliability risk, the schedule of
12 nuclear generation retirement and refurbishment, and emerging asset condition data.

13
14 • Hydro One's extensive customer engagement exercise took place in early 2016, as
15 described in Exhibit B1, Tab 2, Schedule 2. It was Hydro One's first systematic attempt
16 to consult customers specifically on their needs and preferences in a manner that could
17 inform Hydro One's investment plan. Accordingly, the results of that undertaking were
18 not available at the time of Hydro One's last rate application. Based on customer
19 feedback regarding the importance of system reliability and mitigating reliability risk,
20 Hydro One has attempted to maintain an appropriate balance between system reliability
21 and corresponding rate impact.

22
23 • Hydro One's reliability risk model was developed in early 2016 as a planning tool that
24 helps assess future system reliability, so information regarding reliability risk was
25 unavailable at the time of Hydro One's last rate application. It reflects Hydro One's
26 attempt to develop a model that provides a directional indication on the level of capital
27 investment needed to reduce risk to system reliability. The reliability risk model is
28 developed as a leading indicator for system reliability performance. The typical duration
29 needed to scope and execute a transmission investment is between three to five
30 years. Therefore, the key to maintaining top quartile reliability performance is to
31 remediate reliability risk before it manifests itself as deterioration in SAIDI and SAIFI.
32 The model is also used to cross-check the bottom-up determination of Sustainment
33 capital spending levels needed to address asset needs described in Exhibit B1, Tab 2,
34 Schedule 5.

35
36 • The schedule for Bruce Power and Ontario Power Generation's nuclear generation
37 refurbishment and retirement was unclear in 2014 and, therefore, unavailable at the time

1 of Hydro One's last rate application. This will significantly reduce base load generation
2 availability between 2022 and 2030. Accordingly, Hydro One is taking steps to ensure
3 transmission assets connecting the other generation assets are available to support system
4 requirements.

- 5
- 6 • The increases are also attributable to new information regarding asset needs. At the time
7 of Hydro One's last rate application, the urgency to address CP/COB insulator condition
8 was not clearly understood. A 2016 testing report by Electric Power Research Institute
9 ("EPRI") on Hydro One's CP/COB insulators validated that they have deteriorated to the
10 point that replacement program needs to be accelerated to ensure safety and reliability.
11 Please refer to Exhibit B1, Tab 3, Schedule 11, Investment Summary Document #S79. A
12 new structure coating product recently became available, enabling modifications to
13 Hydro One's tower coating method, making it more efficient. Together with a new
14 technical assessment conducted with EPRI, Hydro One was able to develop a coating
15 program to extend life of transmission structures in high corrosive zones, which is
16 reflected in the current application. Refer to Exhibit B1, Tab 3, Schedule 11, Investment
17 Summary Document #S76 for more details.

18

19 ii) The increases described above for Development capital forecasts are confirmed. The
20 increased capital expenditures in 2017 and 2018 are primarily due to unexpected delays in
21 the Clarington TS and the Supply to Essex County Transmission Reinforcement projects, as
22 well as the addition of two new load connection projects to the forecast (Hanmer TS and
23 Runnymede TS). Details on these projects are available in Exhibit B1, Tab 3, Schedule 11,
24 Investment Summary Documents #D01, D14, D18, and D19 respectively.

25

26 iii) Hydro One confirms that the Operations capital forecasts for 2017 and 2018 are 42.8% lower
27 and 22.2% higher, respectively, than the forecasts provided in its EB-2014-0140 filing. (Note
28 that the percentage change for 2018 is mistyped in the question.) The decrease in 2017
29 Operation capital expenditures can be attributed to reprioritization of the following
30 investments that were referenced in the EB-2014-0140 application: mobile radio
31 replacement, the telemetry expansion program, the distance to fault - fault locating program,
32 wireless station cameras and the wide area network outreach program. The increase in 2018
33 Operations capital expenditures can be attributed to: (a) a shift in the work schedule and
34 scope of the Integrated System Operations Centre project; and (b) the additional sustainment
35 investment in station local control equipment. Details on these investments are provided in
36 Exhibit B1, Tab 3, Schedule 11, Investment Summary Documents #O01 and #O02,
37 respectively.

Witness: Chong Kiat Ng/Glenn Scott

1
2 iv) It is assumed that this question compares Common Corporate capital forecasts provided in
3 the current application and in the EB-2014-0140 application. The increases described above
4 are confirmed. The increases are largely attributable to changes in information technology
5 (“IT”) forecasts and transport, equipment and service equipment (“TWE”) forecasts driven
6 by new information.

7
8 • In the EB-2014-0140 application, IT estimates for 2017 and 2018 were based on class 'D'
9 estimates (+50% accuracy) premised on a comparable business case for a medium size,
10 complex SAP implementation of new functionality and enhancements. The estimates
11 provided in the current application are based on more mature investment plans, meaning
12 better defined requirements, proof-of-concept and/or actual vendor quotes. Also,
13 emerging business needs to address process inefficiencies have driven additional
14 investments not reflected in the 2014 application. For example, certain treasury, finance
15 and human resource functions will be integrated into the existing enterprise SAP system
16 to minimize manual tasks and promote a streamlined, more efficient enterprise
17 environment. As part of Hydro One’s “Security Event and Incident Management”
18 upgrade and refresh initiative, a third-party assessment was commissioned in 2015 to
19 review current design and practices, and make recommendations for improvements as
20 needed. This resulted in a new investment in IT security as detailed in Exhibit B1, Tab 3,
21 Schedule 6.

22
23 • For TWE, the cost increases are associated with a small increase in budget and an
24 increase in costs allocated to the transmission business, reflecting the increased use of
25 fleet assets for transmission work. Please refer to page 7 of Attachment 1 to Exhibit B1,
26 Tab 3, Schedule 9 for a summary of the allocation approach for TWE.
27

1 **Ontario Energy Board (Board Staff) INTERROGATORY #140**

2
3 **Reference:**

4 Exhibit C1/Tab 3/Sch7 – Section 2.1 Transmission Stations and Buildings

5
6 **Interrogatory:**

7 This section states that a province wide reassessment was due to take place in 2016 by MPAC to
8 refresh property values for property tax calculation purposes. Has this reassessment been
9 received and how does it impact the values shown in Table 2?

10
11 **Response:**

12 As of the date of this response, Hydro One has not received any notices of the province-wide re-
13 assessment.