RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 1:

Reference(s): Exhibit 1B, Tab 2, Schedule 4, Appendix B

Preamble:
This exhibit is Navigant's Independent Assessment of Toronto Hydro's Distribution System Plan and Business Cases. On page 13 the Feeder Investment Model (FIM) is described as "a series of distribution simulation and analytical tools designed to predict asset performance and equipment loading under a range of operating conditions".

Energy Probe has understood the FIM to be an analytical tool for evaluating when an asset should be replaced but not as a simulation tool for predicting asset performance and equipment loading.

Please explain how the FIM performs asset performance and equipment loading analyses.

RESPONSE (PREPARED BY NAVIGANT):

Navigant's understanding of the FIM is similar to Energy Probe's. The FIM uses asset performance indicators (e.g., age and asset health) and equipment loading as inputs to a predictive asset performance (i.e., failure risk) model that is used to determine the economically optimal intervention time for various assets and to prioritized and optimize the selection of capital projects in its DSP.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 2:

Reference(s): Exhibit 1B, Tab 2, Schedule 5, Appendix B, PSE Report, pages 3-5 and Figure 3 and Table1 page 13

Preamble:

Figure 1 illustrates the vast differences between Toronto Hydro and the rest of the Ontario distributors, in terms of number of customers served. Related to this difference is the fact that Toronto Hydro also serves a large urban core (the Toronto area). Serving a large urban core presents unique cost challenges that are discussed further in another PSE report attached as an Appendix to this report entitled, "Capital Requirements for Serving Developed Environments."

a) Confirm TH customer base in 2019.
b) Please indicate whether Customer base data for benchmarking is customers, bills or connections.
c) Discuss the differences in the context of benchmarking costs.
d) Please indicate how Load Density influences costs for benchmarking.
e) Please indicate whether the TH cohort cut off is 800,000 customers, 1,000,000 or another number. Modify the response to parts b & c accordingly.
f) Please provide the list of Canadian Utilities in the 400,000-800,000 customer data set.
g) Please provide the # and list of US utilities in the 400,000-800,000 customer data set.
h) Please indicate how many of cohort have predominantly an Urban customer base (>50%).
i) Please indicate # and list of Urban centres (>100,000 population) in the cohort(s).
j) Please indicate why the TH line in Figure 3 rises to over 1,000,000.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

RESPONSE (PREPARED BY PSE):

a) The updated customer number inserted in the model for Toronto Hydro in 2019 is 796,865.

b) The data used is based on the number of customers, exclusive of Street lighting devices and USL connections.

c) The differences would be that different numbers would be used if the variable was based on a different definition. PSE used the number of customers for the sample (and for Toronto Hydro) in order to have a consistent definition.

d) PSE estimated an urban core variable, which showed that urban cores, which have extremely high load densities, present higher cost challenges to utilities. The Appendix in the PSE report included a separate analysis conducted by PSE that quantified the cost challenges of load density for six different possibilities. Each analysis showed that there are cost pressures associated with serving extremely high load density areas.

e) There is no cohort cut-off in the PSE study. The entire sample is used for determining the benchmark values in the study. Figure 1 only illustrated the vast differences between Toronto Hydro and the rest of the Ontario industry. The cut-offs on that graph have no bearing on the study results. On Figure 1, Toronto Hydro is the only utility in the sample in the 600,000 to 800,000 customer count range. Toronto Hydro is actually the only utility between 400,000 and 1,200,000 customers. There is no need to modify the responses to parts b and c.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

f) No Ontario distributors have customer counts between 400,000 and 800,000 besides Toronto Hydro. For a list of distributors and their customer counts please see Table 1, page 13 found in the PSE Report (Exhibit 1B, Tab 2, Schedule 5, Appendix B) .

g) Please see Exhibit 1B, Tab 2, Schedule 5, Appendix B, Table 1, page 13 for a list of the U.S. utilities and their customer counts. There are 31 utilities in the U.S. sample with 2011 customer counts between 400,000 and 800,000. The U.S. utilities with 2011 customer counts between 400,000 and 800,000 are: Atlantic City Electric, West Penn Power, Central Maine Power, Duke Energy Ohio, Cleveland Electric Illuminating, Dayton Power & Light, Delmarva Power & Light, Duquesne Light, Entergy Arkansas, Entergy Mississippi, Gulf Power, Idaho Power, Indiana Michigan Power, Indianapolis Power & Light, Kansas City Power & Light, Kentucky Utilities, Metropolitan Edison, Northern Indiana Public Service, Oklahoma Gas and Electric, Pennsylvania Electric, Potomac Electric Power, Duke Energy IN, Public Service of New Hampshire, Public Service of New Mexico, Public Service of Oklahoma, South Carolina Electric & Gas, Southwestern Electric Power, Tampa Electric, Tucson Electric Power, Wisconsin Power and Light, and Wisconsin Public Service.

h) PSE did not create a variable based on the percentage of urban base.

i) PSE did not create a variable based on a 100,000 population cut-off.

j) Toronto Hydro benchmark and projected cost lines rise over $1,000,000,000 because both the model expected total costs and forecasted total costs exceed $1,000,000,000 in the future.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 3:

Reference(s): Exhibit 1B, Tab 2, Schedule 5, Appendix B, PSE Report, pages 7-8 and Figures 4 and 5

Preamble:

PSE's reliability benchmarking analysis indicates the following findings.

1. Historical SAIFI metrics for Toronto Hydro are higher than the benchmark values.
2. Projected SAIFI metrics converge towards the benchmark values through 2019.
3. Historical SAIDI metrics for Toronto Hydro are lower than the benchmark values.

a) Please confirm the historic and projected SAIDI and SAIFI chart data set are
   - with or without LoS;
   - with or without MEDs;
   - with or without scheduled maintenance; and,
   - with or without sustained outage (excluding MAIFI outages<1min).

b) Please provide a data set that uses identical data as projections set out in the TH DSP (Exhibit 2B Section C3 Figure 7 and Figure 8 CHECK without LoS and MEDs.

c) Please revise Figures 4 and 5 to be consistent the SAIDI/SAIFI charts in the DSP.

d) Confirm/amend your conclusions.

e) Please amend Figures 6 and 7, if required.

RESPONSE (PREPARED BY PSE):

a) PSE used the reliability indexes that include loss of supply ("LoS") in the reliability indexes. These are indexes were gathered from the OEB's Yearbook of Electricity

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

Distributors. The data gathered in the Yearbooks are indexes that include major event days ("MEDs") outages. The indexes include scheduled or planned outages, but do not include outages below the sustained definition threshold. Data for the U.S. includes the LoS, MEDs, scheduled maintenance, and have a sustained outage definition threshold which typically varies from one minute to five minutes.

b) Creating a dataset and analysis of data without LoS and MEDs would take a significant amount of time. Additionally, it is not clear to PSE whether Ontario data excluding MEDs is available, nor is a consistent data source excluding LoS for the U.S. sample available. PSE did conduct a test of the U.S. data that excluded MEDs. This analysis showed similar results to those presented in the PSE report.

c) Please see response to part b.

d) No amendment to conclusions.

e) Not required.

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INTERROGATORY 4:

Reference(s): Exhibit 1B, Tab 2, Schedule 5, Appendix B, PSE Report, pages 7-8

Preamble:

Toronto Hydro's capital infrastructure seems to be producing a higher than expected number of outages. The company's average 2010-2012 SAIFI is 73% above benchmark expectations. This implies Toronto Hydro customers experience 73% more outages then (sic) our models predict. The SAIFI projections, assuming full funding, move the company towards the benchmark SAIFI value, reducing the number of outages experienced by customers. Thus, the company's plan to increase capital spending to address SAIFI is, in our opinion, reasonable from a benchmarking perspective.

Toronto Hydro's response to outages, measured by SAIDI, is quite strong and is projected to continue to be strong. The company's 2010-2012 average is 48% below benchmark expectations. This implies that Toronto Hydro customers experience 48% fewer outage minutes than our models predict. By 2015, the company's SAIDI is projected to be nearly 84% below benchmark expectations.

a) Please discuss whether SAIDI or SAIFI is a "better" measure from a customer satisfaction perspective, taking into account economic and other factors.
b) In PSE's view why is TH SAIFI so bad relative to peer group cohort? Please discuss.
c) Is a comparison with major urban utilities with extensive underground infrastructure available?
d) If so, provide a copy.

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e) If MAIFI events were included/removed from the data, in PSEs view would this change the picture?

RESPONSE (PREPARED BY PSE):

a) PSE's scope was to assess SAIDI and SAIFI from a benchmark perspective. It was not in PSE's scope to analyze where indexes should be from a customer satisfaction perspective, or which index is more important to customers.

b) One possibility for the poor performance is an aged infrastructure in need of capital spending. However, PSE did not undertake an evaluation of the exact reasons why SAIFI values for THESL are above the benchmarks.

c) PSE did not conduct an analysis limiting the data set to only major urban utilities. PSE chose to avoid making sample exclusions in the study, except for utilities where data was unavailable.

d) No study was conducted.

e) MAIFI is not a commonly recorded index and the data is not publically available, to PSE's knowledge, for most of the data set. Including the MAIFI event data into the analysis is not a possible task.

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INTERROGATORY 5:

Reference(s): **Exhibit 1B, Tab 2, Schedule 5, Appendix B, PSE Report, page 19, Table 2**

a) Please explain why only 3years if date were used to provide the average rather than a normal 5+ years.

b) Please compare the Input Parameters in Table 2 and in particular Ontario Sample to those in the PEG Report (Table).

c) Please provide a Tabulation of the TH data in Table 2 and provide sources and explanations for each of the values.

d) In particular, please explain in more detail the following:

- Price of Capital Services
- Price of OM&A inputs
- Percentage Electric customers in Gas and Electric Customers(also explain Ontario)

RESPONSE (PREPARED BY PSE):

a) Table 2 simply illustrates the data variable averages over the most recent three years. In PSE's experience, there is not a "normal" standard of 5+ years. The data for all years and all observations is available in the response to Interrogatory 1B-OEBStaff-14.

b) The PEG report did not include a table similar to Table 2 found in the PSE report. It is unclear to PSE what table in the PEG report is being referred to in this question.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

c) All of Toronto Hydro's data used in the PSE benchmarking study can be examined. Please find the data sources in the response to Interrogatory 1B-OEBStaff-14. Sources and explanations of the variables can be found in the PSE Report on pages 15 through 18.

d) Please see response to part c.

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INTERROGATORY 6:

Reference(s): Exhibit 1B, Tab 2, Schedule 5, Appendix B, PSE Report, page 19 Table 6

Preamble:

It is our understanding that around 2006 or 2007 the company increased its capital investments. This has moved the company's total cost performance from 30% below benchmark to 17% below by 2013. This movement to invest more in capital during that time frame is a reason why Toronto Hydro's total factor productivity ("TFP") declined in the recent past.

a) Confirm data results in Table 6 have been adjusted for US/Can $ exchange rates.
b) If not, indicate if the difference is material and if this be corrected?
c) Please provide a chart based on Table 6 that shows for TH its total cost percentage below cohort benchmark and actual costs from 2002-2013A and 2014-2019F

RESPONSE (PREPARED BY PSE):

a) Data results for Toronto Hydro are in Canadian dollars. The response to Interrogatory 1B-OEBStaff-13 may be helpful in this regard.

b) Data results are in Canadian dollars for Toronto Hydro – no correction is necessary.

c) Figure 3 on page 5 of the PSE Report provides a chart based on Table 6.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 7:

Reference(s): Exhibit 1B, Tab 2, Schedule 6, Page 4 of 4

Preamble:

Performance Metrics

Toronto Hydro proposes to file an annual update on these metrics in the second quarter of the year, following the release of its annual financial statements. The nature of the update is described in further detail in Section C of the DSP, Exhibit 2B.

Annual Distribution Rates

Toronto Hydro's proposed rate framework for the CIR application uses a custom Price Cap Index ("PCI") as the annual adjustment mechanism for its base distribution rates in 2016 to 2019. The custom PCI employs the OEB's inflation factor as an input to the formula. Accordingly, Toronto Hydro proposes to submit a distribution rate adjustment on an annual basis followings OEB's determination of the newest inflation factor (which typically occurs later in the calendar year) and at a date prior to when those rates are to come into effect.

a) In the context of the above Reporting regimes please indicate where the Stakeholder/Ratepayer Engagement Plan(s)/Processes are filed in the evidence.
b) If not filed, please provide a copy and in particular a summary of the engagement with TH ratepayers related to the above Performance Metrics and Annual Distribution Rates during the CIR Plan.

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RESPONSE:

a) Toronto Hydro expects the annual reporting updates and rate adjustments referenced in the preamble to be formulaic in nature. Therefore, the utility does not plan to engage customers directly on these matters.

b) As noted in part a), Toronto Hydro does not plan to engage customers directly on the specifics of its reporting to the OEB. Many of the performance metrics to be reported on were established by the OEB as part of the Scorecard required for each electricity distributor (see EB-2010-0379, Report of the Board-Performance Measurement for Electricity Distributors: A Scorecard Approach). As part of its annual Scorecard process, the utility posts its Scorecard on its website. The additional measures listed in Exhibit 2B, Section C, Table 1 (page 3), which are specific to Toronto Hydro, were developed in reference to the OEB Filing Requirements for Electricity Transmission and Distribution Applications.

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INTERROGATORY 8:

Reference(s): Exhibit 2A, Tab 10, Schedule 2, pages 1-2, Figures 1 and 2

Preamble:

Scenarios 1 and 2 provide SAIFI and SAIDI in the filing manner required by OEB Appendix 2-G (Exhibit 2A, Tab 10, Schedule 3). Scenarios 3 and 4 provide SAIFI and SAIDI values by excluding additional externalities and controllable outages, to give a more normalized reflection of total system reliability. Each of these values provides valuable information as to the causes, duration, and frequency of outages within Toronto Hydro's distribution system.

a) Confirm SAIDI and SAIFI are Metrics contained in the new OEB RRFE Scorecard for Electricity Distributors.
b) Please provide a historic SAIDI, SAIFI and CAIDI charts without LOS and MEDS, but including SOs
c) Provide a forecast of SAIDI, SAIFI and CAIDI for the period 2014-2019 including the CIR period 2016-2019, excluding LOS and MEDs, but including SOs.
d) Please provide the 5 year average SAIDI and SAIFI for the CIR Plan and Compare to Appendix 2-G historical Average

RESPONSE:

a) Confirmed.

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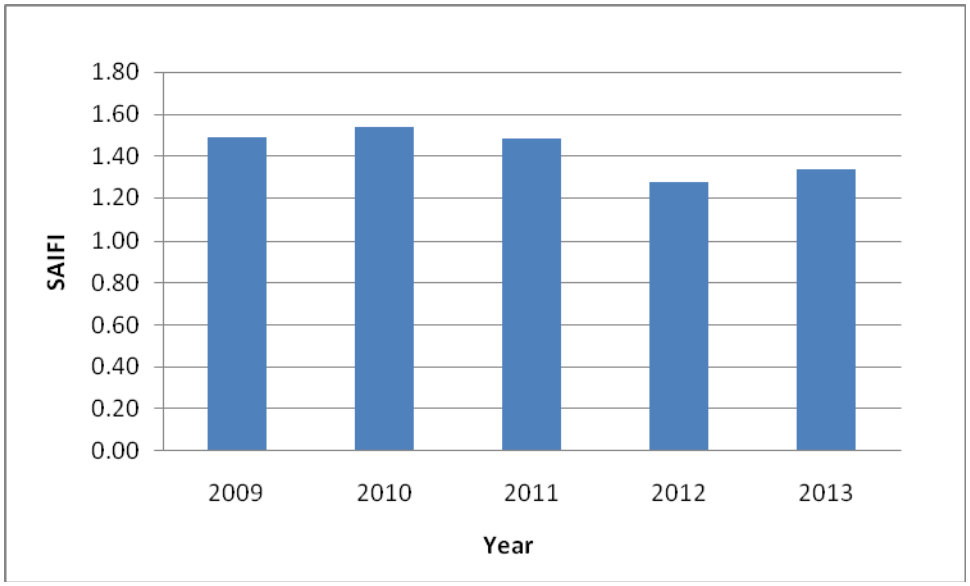
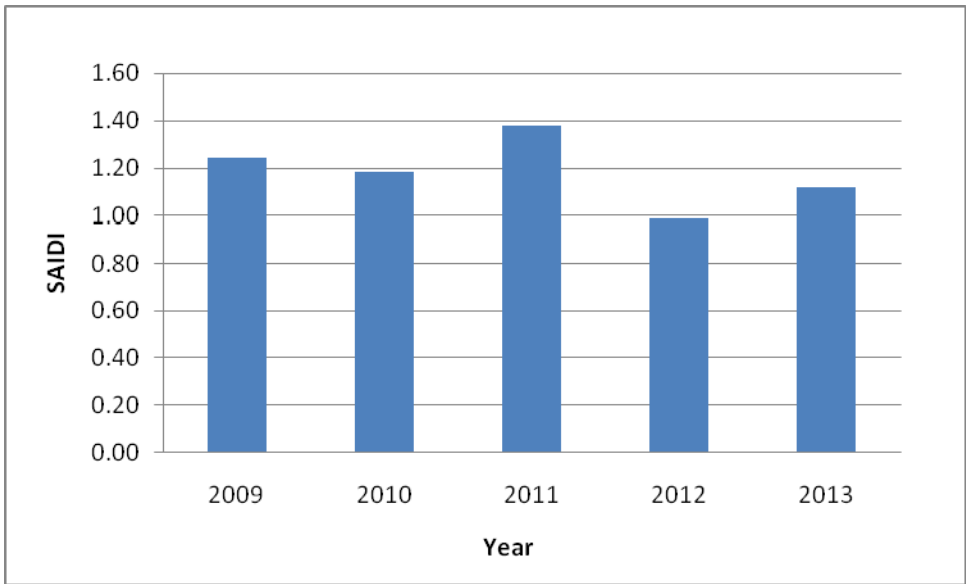
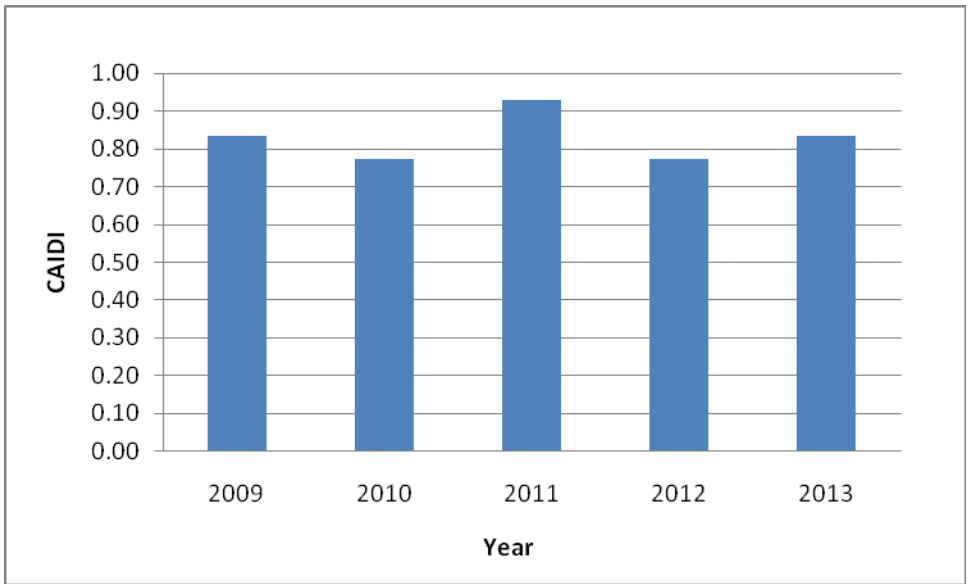
b) Please see the following graphs for SAIFI, SAIDI and CAIDI without MEDs and Loss of Supply, but including Scheduled Outages.





Panel: Distribution Capital and System Maintenance

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES



c) The below table shows the 2014 Forecast and 2015 projections for SAIDI, SAIFI and CAIDI for the period 2014-2019 including the CIR period 2016-2019, excluding LOS and MEDs, but including Scheduled Outages. Please note that 2014 is a forecast, while 2015-2019 is a projection based on the completion of the capital investment and maintenance program detailed in this application.

	2014F	2015P	2016P	2017P	2018P	2019P
SAIFI	1.31	1.39	1.28	1.20	1.11	1.03
SAIDI	0.97	1.16	1.10	1.05	1.01	0.95
CAIDI	0.74	0.83	0.86	0.87	0.91	0.92

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d) The five-year SAIDI and SAIFI for the CIR Plan (above in part c) is calculated excluding MEDs and LOS. This is appropriate given that MEDs are by their nature unpredictable and LOS events are beyond Toronto Hydro's control. However, the historical averages presented in Appendix 2-G include MEDs (in accordance with the OEB's filing requirements) and are therefore not meaningfully comparable. As an alternative, the table below presents a comparison between the 2009-2013 actual and forecast and the 2015-2019 projected SAIFI and SAIDI, without MEDs and without Loss of Supply, but including Scheduled Outages.

	5-Year Average (2009-2013)	5-Year Average of CIR Plan (2015-2019)
SAIFI	1.42	1.20
SAIDI	1.18	1.05

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INTERROGATORY 9:

Reference(s): **Exhibit 2A, Tab 10, Schedule 2, pp. 10-11, Figures 10 and11**
Exhibit 2B, Section C4.1, page 28

Preamble:

Defective Equipment and Tree contacts are two of the primary causes of outage.

a) Please provide a chart showing both historic 2009-2013 and forecast 2014-2019 contributions to SAIFI and SAIDI from Defective Equipment excluding MEDs.
b) Please provide chart showing both historic and forecast 2014-2019 contributions to SAIFI and SAIDI Tree Contacts excluding MEDs.
c) Please indicate clearly how the forecast was derived, including reference to types of equipment in Figures 16 and 17 pages 15/16 of the main Reference.
d) Please provide Charts Similar to Figures 11 in the second reference showing forecasts and trends for outages caused by Defective Equipment.
e) Please comment whether reduction in SAIDI/SAIFI due outages from Defective Equipment and Tree Contacts are reasonable Metrics to judge the Outcomes of Equipment Refurbishment/Replacement and Vegetation Management Programs.
f) Please comment on whether THESL would commit to the forecast targets as a Metric for assessing its Capital Equipment Refurbishment/Replacement and Vegetation Management Programs over the CIR Plan period.
g) If not, please provide a full explanation.

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RESPONSE:

a) The following table shows historic and forecast contributions to SAIFI and SAIDI from Defective Equipment (excluding MEDs).

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SAIFI	46%	40%	38%	45%	37%	40%	39%	38%	37%	36%	35%
SAIDI	50%	38%	41%	54%	40%	54%	42%	40%	39%	37%	36%

b) The following table shows the historic and forecast contributions to SAIFI and SAIDI from Tree Contacts (excluding MEDs).

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SAIFI	8%	8%	12%	6%	10%	9%	8%	7%	7%	7%	6%
SAIDI	8%	15%	19%	6%	15%	13%	13%	12%	12%	12%	11%

c) Please refer to Toronto Hydro's response to interrogatory 1A-CCC-5 part (b) for a description of how the projections are calculated. More specifically, defective equipment was reviewed at the individual asset class level and its reliability was projected based on the historical reliability, capital programs, and the Long-Term System Review Process.

d) Please see the chart on the following page.

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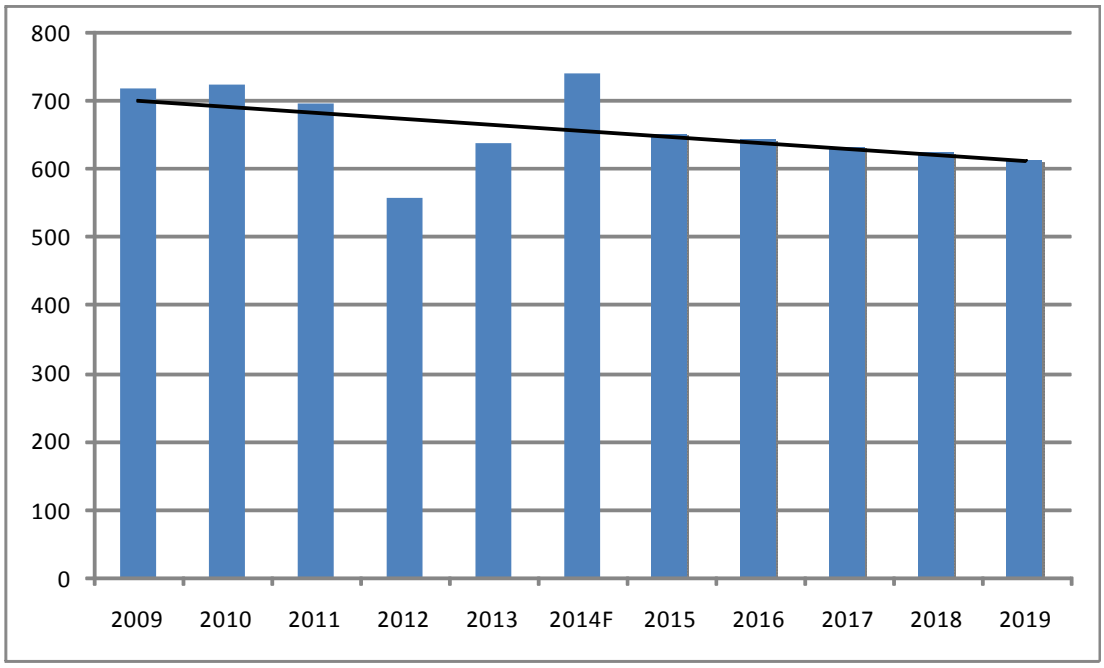

The values presented for the 2015-2019 timeframe are products of a linear trend of the existing 2009 to 2014 (Forecast) number of equipment failures. However, Toronto Hydro believes that this representation of a linear trend reflects a simplified analysis for the 2015 to 2019 period, which is inappropriate for the purposes of target setting. The historical period results reflect various trends and shifts that cannot be adequately captured by a linear trend projection, but can be expected to reasonably occur over the plan term (for example, from 2012 to 2014, there has been a sharp increase in the number of asset failures, which can be explained by the post-2013 ice storm damage to Toronto Hydro assets). As described further in part (f), using this measure on an ongoing basis (rather than as a measure of performance relative to the target) allows Toronto Hydro to understand the trends, flag variances for review and recommend changes to improve the overall system.

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e) Toronto Hydro does not agree that tracking SAIDI/SAIFI attributable to Defective Equipment and Tree Contact outage cause codes would be an appropriate metric to evaluate the outcomes of Equipment Refurbishment/Replacement and Vegetation Management for the following reasons:

i) Defective Equipment – As targeted asset renewal programs progress, the failure probability is expected to be mitigated through work on the individual assets. However, this involves looking at one asset or a small subset of assets in a localized project area, and would thus not be meaningfully reflected on system-wide measures such as SAIFI and SAIDI.

ii) Tree Contacts – The Vegetation Management program at Toronto Hydro targets feeders on a cyclical basis. While there is ongoing work towards modelling improvements and response strategy modifications, (e.g., optimal times for corrective trimming), the program itself is deployed to maintain the current level of tree-related outages, rather than improve it. Notwithstanding this ongoing work, the Vegetation Contact cause code performance itself is heavily dependent on weather conditions. As an example, 2012 saw a dramatic decrease in the number of tree-related outages, which was due to a shift in the weather pattern from the historical norm, rather than any changes to the vegetation management practices.

As described above, using the Vegetation Contact and Defective Equipment statistics to measure performance against a specific target is problematic, due to the practical considerations that can materially affect the targets' results irrespective of the utility's efforts on related capital or maintenance programs. Given the limited experience in

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

the area of capital performance measurement on the part of the OEB and the utility, the DSP metrics as described in Exhibit 2B, Section C were advanced for the purposes of ongoing monitoring to track continuous improvement, rather than performance standards to be used against pre-determined targets.

f) As discussed in Exhibit 2B, Section C Toronto Hydro expects to measure its performance throughout the plan term and take mitigation steps, where warranted and/or possible and practicable with respect to the performance measures advanced in this application. This should provide the OEB and Toronto Hydro with meaningful insights that could potentially be applied towards a more prescriptive performance measurement framework in the future.

g) See the response to (f) above.

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INTERROGATORY 10:

Reference(s): Exhibit 2A, Tab 10, Schedule 1, page 2, Table 1

Preamble:
The Distribution System Code outlines certain obligations regarding missed and rescheduled appointments with customers in section 7.5.1.

Section 7.5.2 of the Code requires that distributors meet that obligation 100 percent of the time. It requires that if the appointments are to be missed, a distributor must attempt to inform the customer beforehand and reschedule the appointment.

a) Confirm THESL has not met this requirement in three of the past 5 years and in 2013 dropped to a 93% Rescheduling ESQR.
b) Please provide an explanation of factors under control of THESL and those that are not.
c) What remedial actions is THESL going to undertake (summary and timing)?
d) Has THESL considered asking for an exception to Sections 7.5.1 and 7.5.2?
e) If so, provide parameters of this.

RESPONSE:

a) Toronto Hydro confirms that it has not met the 100% target in three of the past five years. However, in preparing this response, Toronto Hydro discovered an error in the data reported. Specifically, in 2013 Toronto Hydro scheduled a total of 14,677 appointments, of which it missed 61. Of these 61, it failed to correctly reschedule 1

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

(not 4, as originally reported). This 1 missed appointment corresponds to a 98.4% Rescheduling ESQR (not 93.5%, as originally reported). Toronto Hydro intends to submit a revision request to the OEB in order to update its RRR records accordingly.

b) Factors under Toronto Hydro's control include resource and capacity planning, resource scheduling, appointment management, vendor management, and contingency planning. Factors outside of Toronto Hydro's control include inclement or severe weather conditions, unexpected emergencies encountered by the employee/contractor (illnesses, witness to a vehicle accident, encounter a safety risk en-route, etc.), or high-level emergencies requiring Toronto Hydro to divert resources to other priority tasks.

c) As explained in detail on pages 1 and 2 of Exhibit 2A, Tab 10, Schedule 1, Toronto Hydro believes that the results under this ESQR are more a function of the mathematical data rather than an underlying performance issue. Toronto Hydro has only incorrectly rescheduled a single missed appointment in each of the three affected years (2009, 2012, and 2013). As a result, Toronto Hydro does not believe that these small numbers (three affected customers over a five year period) warrant a specific remedial action, other than a continuous effort on the part of Toronto Hydro to attempt to comply with the requirements.

d) Toronto Hydro has not considered asking for an exception or exemption to section 7.5.1 or 7.5.2, as Toronto Hydro does not believe the inherent difficulties in meeting an ESQR with a 100% target are unique to its circumstances. However, given the effort required to track it, the very small number of customers affected by missed appointments, and the even smaller number of customers affected by incorrectly

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rescheduled appointments, Toronto Hydro believes that this measure may benefit from review by the OEB. Toronto Hydro has noted these concerns to the OEB in the past, and would support a generic review of this ESQR by the OEB.

e) See d) above.

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INTERROGATORY 11:

Reference(s): **Exhibit 2A, Tab 10, Schedule 3, Page 1**
OEB Appendix 2-G, Service Reliability Indicators 2009-2013

a) Please provide a forecast for the SQRS for the period 2014-2019.
b) Please provide explanation/commentary on any SQRS that exhibit significant differences from the Minimum Standard.
c) Please provide explanation of significant changes/trends over the CIR period.

RESPONSE:

a) Toronto Hydro expects results for 2015-2019 to largely be in line with historical averages, with the exception of an expected improvement to the Emergency Response ESQR. Toronto Hydro is unable to provide a specific forecast for each ESQR for this period. The 2014 YTD values (up to September 2014) are provided in the table below.

ESQR Measure	2014 YTD
Service Connections <750 V	91.60%
Service Connections >750 V	100%
Reconnections	100%
Micro-Embedded Generation Facilities	100%
Appointment Scheduling	95.89%
Appointments Met	99.70%
Appointment Rescheduling	91.18%
Telephone Accessibility	70.92%

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ESQR Measure	2014 YTD
Telephone Call Abandon Rate	1.90%
Written Inquiry Response	94.44%
Emergency Response	94.66%

b) Historic variances from minimum standards are discussed in detail in Exhibit 2A, Tab 10, Schedule 1. Toronto Hydro is not expecting any metrics to be below the minimum standard over the 2015-2019 period.

c) See a) above. Toronto Hydro expects an improvement in the Emergency Response ESQR as a result of increased availability of resources to perform emergency response functions. Please refer to Exhibit 4A, Tab 2, Schedule 3 for additional details.

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INTERROGATORY 12:

Reference(s):

Exhibit 2B, Section C2, Page 3, Table 1 & Section C3, Figure 7 and Figure 8

Preamble:

Table 1 shows Proposed Performance Measures Framework encompassing SAIDI, SAIFI, CAIDI, FESI and MAIFI.

a) Please provide a chart that show Historic 2009-2013 and forecast 2014-2019 FESI.
b) Please indicate clearly how the forecasts were derived.
c) Please comment on whether THESL would commit to the FESI forecast as a Metric for assessing the outcomes of its investments targeted towards service improvements on the utility's worst performing feeders. (E6.21) over the CIR Plan period.
d) If not, please provide a full explanation.
e) Please provide a chart that show Historic 2009-2013 and forecast 2014-2019 MAIFI.
f) Please comment on whether THESL would commit to the MAIFI forecast as a Metric for assessing the outcomes of its investments targeted towards service improvements r [sic] similar to SAIFI projections for outages over 1 minute.
g) If not, please provide a clear explanation.

RESPONSE:

a) Please refer to the following table for the historic FESI statistics:

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	2009	2010	2011	2012	2013
FESI	38	41	35	29	33

Toronto Hydro did not provide future year projections of this measure, as it submits that doing so is not practical for reasons that follow. The FESI metric is unique in that it targets localized events and outage trends, rather than system-wide statistics that can be normalized over a larger sample. As described in Exhibit 2B, Section C2.2.3, the metric becomes very volatile and unpredictable with respect to specific feeders experiencing outages, and the frequency of those outages in a given year. The volatility and annual shift in affected feeders, as shown in Exhibit E6.21 Figures 1 to 4, make any forecasts or projections impractical. By the very nature of its 12-month tracking window, the FESI program (and the associated measure) entails a short-term reactive mitigation approach, with long-term projects (e.g., System Renewal) to address root causes.

b) Please see the response (a) above.

c) As discussed in the Exhibit 2B, Section C and in the response to part (a) of this interrogatory, FESI is typically a volatile measure that can be affected by numerous factors (e.g. large storms or emerging failure trends) which significantly challenge Toronto Hydro's ability to forecast this measure with accuracy. In addition, Toronto Hydro notes that the OEB's policy with respect to performance measurement in the area of capital planning and implementation is in the early stages; therefore, in Toronto Hydro's respectful view, establishing firm targets on any of the proposed DSP measures is premature for the purposes of the 2015-2019 CIR period.

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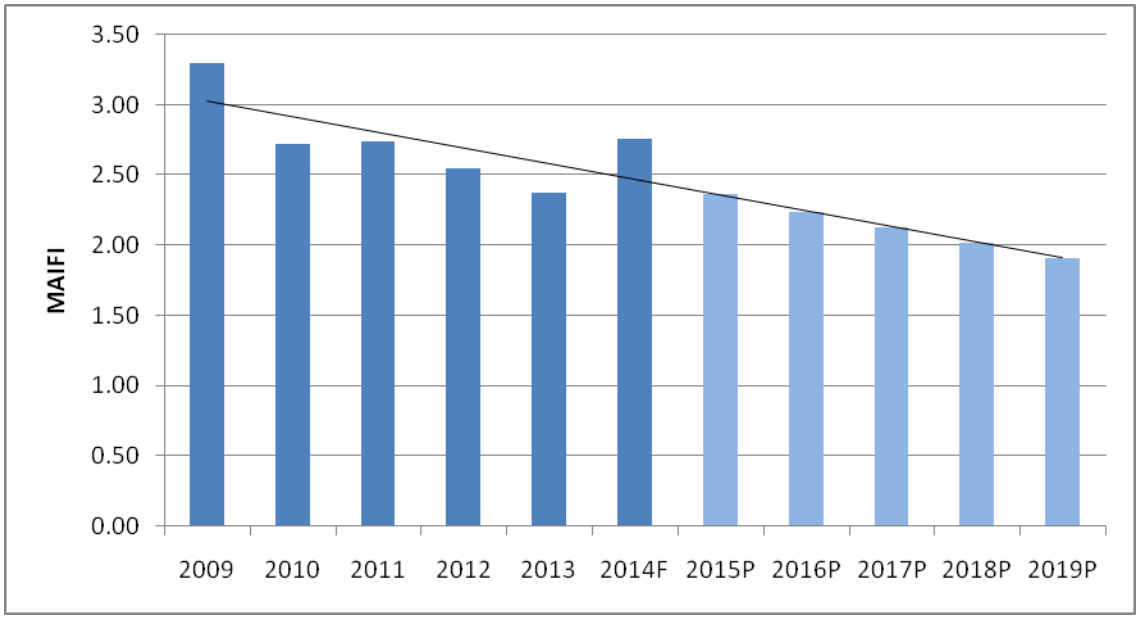
d) See the response to part (c) above.

e) The following graph showcases the 2009-2013 historical results, 2014 year end forecast and 2015-2019 linear trend for MAIFI based on historical results. As mentioned in Exhibit 2B, Section C2.3.2, Toronto Hydro attributes its improved MAIFI performance to the same factors that have led to the decreasing trend in SAIFI.



f) As mentioned in the response to part (e), the MAIFI metric improvement over the historical years has been a secondary benefit of the capital programs targeting outage frequency in general. Toronto Hydro's 2015-2019 Distribution System Plan does not contain any specific programs targeting momentary interruptions with the exception of the Momentary Reduction pilot (Exhibit 2B, Section E7.4). In light of the lack of

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investments targeting MAIFI improvements, setting a target would be of limited value. Furthermore, as noted in Exhibit 2B, Section C.2.3 Toronto Hydro currently performs MAIFI tracking using a manual data entry process and expects that a transition to a fully automated process planned over the 2015-2019 timeframe may result in material differences from the data collected using the currently employed approach. More generally, given the novelty of the OEB's policy in relation to performance measurement in the area of capital planning and implementation, Ontario utilities such as Toronto Hydro are only beginning to explore the tracking of these types of metrics in respect of outcomes such as reliability improvements. For the above reasons, Toronto Hydro believes that it would be premature to commit to a specific forecast target for the purposes of the 2015-2019 CIR period.

g) Please see the response to part (f) above.

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INTERROGATORY 13:

Reference(s): Exhibit 2B, Section C3.1, Page 15, Distribution System Plan Implementation Progress

Preamble:

Toronto Hydro plans to measure the overall progress of its Distribution System Plan implementation as a rolling ratio of total capital expenditures made over the plan years completed to date, divided by the five-year total amount of OEB-approved capital expenditures approved as a part of the utility's 2015-2019 Distribution System Plan.

a) Please explain why a CAPEX Implementation Progress Index is appropriate compared to an In-Service Assets (ISA) Index.
b) Please provide a description and formula for a rolling ISA Implementation Index based on Rate Base asset additions over the CIR Plan Period.

RESPONSE:

a) Since Toronto Hydro proposes a rolling five-year Distribution System Plan implementation metric, a CAPEX metric enables assessment of all the work undertaken up to the reporting date, irrespective of whether the asset in question has been brought into service or not, which can be a function of circumstances beyond the utility's control (see Exhibit 1B, Tab 2, Schedule 4, Appendix A). In addition, the nature of the financial validation and close-out process required to bring assets into service introduces a timing lag between actual project completion and it being put in-service from the financial perspective. As a result, projects completed in December

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may not go into service in the same year, thereby providing an incomplete picture of the work actually completed. In summary, a CAPEX metric provides a more "current" view of the utility's progress in-year and over the plan term, than would be possible if ISAs were be used as a measurement unit.

b) An ISA Implementation Index would function very similarly to the formula as described in Exhibit 2B, Section C3.1.1, and is provided below:

$$\text{Implementation Progress}_{ISA} = \frac{\Sigma(\text{ISA Year n} \rightarrow \text{ISA Year n+1})}{\text{\$ Five Year OEB Approved Plan}} \text{ [\% of Plan Total]}$$

However, for the reasons outlined in part (a) above, Toronto Hydro submits that a CAPEX measure is more appropriate to gauge the utility's overall progress with respect to DSP implementation.

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INTERROGATORY 14:

Reference(s): **Exhibit 2B**
No Reference – Distribution System Plan and CIR Plan
Metrics and Scorecard

a) Please provide a consolidated Scorecard for the Distribution System Plan showing without LoS and MED, historic 2009-2013 and forecast 2014-2019 Metrics for SAIDI, SAIFI, CAIDI, MAIFI, CAPEX Implementation Index and ISA Implementation Index per Energy Probe IRs above (#12-13). If full historic Data are not available please so indicate and explain.
b) Please indicate whether THESL would commit to the above Metrics (part a) for assessing the Outcomes of its investments targeted towards service improvements and the Scorecard, based on these Metrics, as a measure of its Performance.
c) If not please provide an alternative set of Metrics and Scorecard.
d) Please provide a copy of THESLs OEB Scorecard for Electricity Distributors for 2013.
e) Please comment whether the OEB Scorecard should be used instead of or in parallel with the THESL Scorecard.

RESPONSE:

a) Please see the following table of measures proposed by Toronto Hydro for the purposes of the 2015-2019 CIR application, along with explanations regarding the information that Toronto Hydro is not in a position to provide. The following tables below represent the historical SAIFI, SAIDI, CAIDI and MAIFI metrics. The future

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projections can also be found in various responses to including Interrogatory 2A-EP-8 and Interrogatory 2A-EP-9. Toronto Hydro submits that the forward-looking projections should not be treated as firm targets for the utility's CIR period, in light of the OEB's and the utility's limited experience with capital-related performance measures.

	2009	2010	2011	2012	2013
SAIFI	1.49	1.53	1.48	1.28	1.34
SAIDI	1.24	1.18	1.38	0.99	1.12
MAIFI	3.29	2.71	2.73	2.54	2.34
CAIDI	0.84	0.77	0.93	0.77	0.83

	2014 Forecast	2015 Projection	2016 Projection	2017 Projection	2018 Projection	2019 Projection
SAIFI	1.31	1.39	1.28	1.20	1.11	1.03
SAIDI	0.97	1.16	1.10	1.05	1.01	0.95
MAIFI	2.76	2.36	2.24	2.13	2.02	1.91
CAIDI	0.74	0.83	0.86	0.87	0.91	0.92

The historical CAPEX and ISA Implementation Index for total capital expenditures over the 2009 to 2014 is presented in the table below. Toronto Hydro notes that to illustrate the rolling basis of the CAPEX implementation measure proposed in Exhibit 2B Section C, the utility has assumed that its OEB-approved 2009-2014 capital expenditures have been adopted as a part of a single plan. A similar approach has been applied for the past ISA implementation measure requested in the interrogatory

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(please see response to interrogatory 2B-EP-13 for reasons why Toronto Hydro believes the ISA measure would be less optimal than the proposed CAPEX measure).

	2009	2010	2011	2012	2013	2014
CAPEX Progress	13%	32%	54%	68%	90%	118%
ISA Progress	12%	29%	54%	66%	87%	113%

As to the 2015-2019 CAPEX Implementation forecast, Toronto Hydro notes that this measure's purpose is to gauge the utility's actual progress at any given point in time relative to the aggregate amount of approved work, rather than to set a specific target. As such, the measure is expected to be an important reference point for Toronto Hydro throughout the plan term, but the utility submits that there is little practical value in forecasting the anticipated progress. Similar considerations apply to the ISA implementation measure proposed by Energy Probe and further discussed by Toronto Hydro in the response to Interrogatory 2B-EP-13.

b) The OEB's policy with respect to performance measurement in the area of capital planning and implementation is in the early stages, and in Toronto Hydro's assessment, establishing firm targets based on projections is premature for the purposes of the 2015-2019 CIR period, given the relative lack of experience in capital-related performance measurement on the part of the OEB and the utilities.

c) Exhibit 2B, Section C describes a set of 12 performance measures that the utility proposes to track for the 2015-2019 timeframe. Toronto Hydro submits that these measures and their proposed application over the 2015-2019 timeframe are consistent

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with the requirements of Section 5.2.3, Chapter 5 of the Ontario Energy Board's ("OEB") *Filing Requirements for Electricity Transmission and Distribution Applications ("Filing Requirements").*

d) Please see Appendix A to this Schedule for THESL's 2013 OEB Scorecard for Electricity Distributors.

e) Toronto Hydro understands that the OEB's Annual Scorecard of Distributors applies to all distributors irrespective of the rate-making model chosen under the RRFE. Please see Exhibit 2B, Section C for Toronto Hydro's proposal regarding the manner in which the DSP measures advanced in this application are to be used over the 2015-2019 CIR rate period.

Scorecard - Toronto Hydro-Electric System Limited

Toronto Hydro-Electric System Limited
EB-2014-0116
Interrogatory Responses
2B-EP-14, Appendix A
Filed: 2014 Nov 5
(5 pages)

Performance Outcomes	Performance Categories	Measures	2009	2010	2011	2012	2013	Trend	Target: Industry	Target: Distributor
Customer Focus Services are provided in a manner that responds to identified customer preferences.	Service Quality	New Residential/Small Business Services Connected on Time	96.60%	96.20%	94.00%	92.50%	94.20%	down	90.00%	
		Scheduled Appointments Met On Time	99.70%	99.90%	99.60%	99.30%	99.60%	down	90.00%	
		Telephone Calls Answered On Time	83.70%	69.90%	72.70%	76.90%	82.00%	up	65.00%	
	Customer Satisfaction	First Contact Resolution					77%			
		Billing Accuracy					96.6%			
		Customer Satisfaction Survey Results								
Operational Effectiveness Continuous improvement in productivity and cost performance is achieved; and distributors deliver on system reliability and quality objectives.	Safety	Public Safety [measure to be determined]								
	System Reliability	Average Number of Hours that Power to a Customer is Interrupted	2.76	1.19	1.38	1.46	17.81	up		at least within 1.19 - 2.76
		Average Number of Times that Power to a Customer is Interrupted	1.71	1.54	1.48	1.47	2.39	up		at least within 1.47 - 1.71
	Asset Management	Distribution System Plan Implementation Progress					105%			
	Cost Control	Efficiency Assessment				5	5			
		Total Cost per Customer [1]	$821	$885	$951	$900	$924			
		Total Cost per Km of Line [1]	$57,785	$62,061	$67,015	$65,273	$66,793			
Public Policy Responsiveness Distributors deliver on obligations mandated by government (e.g., in legislation and in regulatory requirements imposed further to Ministerial directives to the Board).	Conservation & Demand Management	Net Annual Peak Demand Savings (Percent of target achieved) [2]			17.00%	21.00%	32.70%			286.27MW
		Net Cumulative Energy Savings (Percent of target achieved)			52.00%	78.00%	99.80%			1,303.99GWh
	Connection of Renewable Generation	Renewable Generation Connection Impact Assessments Completed On Time		90.32%	70.11%	90.79%	100.00%			
		New Micro-embedded Generation Facilities Connected On Time					100.00%		90.00%	
Financial Performance Financial viability is maintained; and savings from operational effectiveness are sustainable.	Financial Ratios	Liquidity: Current Ratio (Current Assets/Current Liabilities)	0.69	1.05	1.26	0.59	0.80			
		Leverage: Total Debt (includes short-term and long-term debt) to Equity Ratio	1.40	1.52	1.43	1.37	1.34			
		Profitability: Regulatory Return on Equity — Deemed (included in rates)			9.58%	9.58%	9.58%			
		Profitability: Regulatory Return on Equity — Achieved			9.73%	7.62%	7.10%			

Legend:
- up
- down
- flat
- target met
- target not met

Notes:
1. These figures were generated by the Board based on the total cost benchmarking analysis conducted by Pacific Economics Group Research, LLC and based on the distributor's annual reported information.
2. The Conservation & Demand Management net annual peak demand savings do not include any persisting peak demand savings from the previous years.

Service Quality

1. New Residential/Small Business Services Connected on Time

In 2013 Toronto Hydro-Electric System Limited ("Toronto Hydro" or "utility") connected 94.2% of approximately 2,700 eligible low-voltage residential and small business customers (those utilizing connections under 750 volts) to its system within the five-day timeline prescribed by the Distribution System Code. This is a 2% improvement from the previous year and above the OEB-mandated threshold of 90%. Serving one of the fastest growing cities in North America, Toronto Hydro receives high volumes of requests to connect new residential developments or businesses each year. Toronto Hydro integrates the connection work with its planned construction activities to help ensure that the scope, nature and timing of connection work do not adversely affect the utility's planned work program. Where possible, Toronto Hydro strives to identify and leverage any potential synergies between the connection work and other planned construction activities undertaken by the utility, other utilities or municipal and provincial government agencies. Toronto Hydro is currently working with its shareholder, the City of Toronto, to further enhance the coordination between the City's and the utility's construction activities.

2. Scheduled Appointments Met on Time

Providing excellence in customer service is at the core of Toronto Hydro's corporate philosophy, and the utility is consistently seeking new ways to foster meaningful two-way communication, expand the range of service offerings, improve service convenience, and integrate new technological advancements to drive service level improvements. In 2013, Toronto Hydro scheduled almost 14,700 appointments with its customers (about 55 appointments per working day) to complete work requested by customers, read meters, reconnect, or otherwise necessary to perform. The utility met 99.6% of these appointments, surpassing the previous year's record by 0.3% and significantly exceeding the industry target of 90%.

3. Telephone Calls Answered on Time

In 2013 Toronto Hydro customer contact centre agents received over 534,000 calls from its customers – over 2,000 calls per working day. An agent answered a call in 30 seconds or less in 82% of these calls, once customers selected an option to speak to the utility's representative. This result significantly exceeds the OEB-mandated 65% target for timely call response. Year over year, the 2013 result amounts to a 5% improvement over 2012, driven primarily by a reduction in the number of calls. Call volumes decreases are attributed to successfully promoting online self-serve features, internal process improvements, and increased customer preference to contact Toronto Hydro via email. In performing this work, Toronto Hydro closely monitors the quality and efficiency of its customer contact activities using a combination of OEB-mandated and internally developed measures and metrics. Toronto Hydro reviews and sets target Telephone Call Answer times on an annual basis based on customer feedback and customer satisfaction priorities, and allocates resources between the various contact centre activities to ensure appropriate levels of service across all types of customer interactions.

Customer Satisfaction

4. First Contact Resolution

In providing assistance to its customers, Toronto Hydro strives to resolve customer enquiries as quickly and efficiently as possible. Starting in 2013, the OEB implemented a new measure to gauge the success rate with which distribution utilities are able to address customer requests at the first instance of contact. For the purposes of 2013 reporting, and given the novelty of this measure, utilities were given an opportunity to define the First Contact Resolution measure in the manner that provides the most meaningful assessment of their performance.

Toronto Hydro measures its first contact resolution as a percentage of telephone enquiries resolved in one call over a 21-day time period. An eligible enquiry is considered resolved in the first call, if a customer does not call back regarding the same enquiry for the same account within 21 calendar days. The metric includes all residential and commercial customer account-related enquiries including those related to:

- Billing;
- Moves;
- Payment and account arrears assistance;
- Online tools; and
- Conservation programs.

Based on the above definition, in 2013 Toronto Hydro successfully resolved 77% of customer requests at the first instance of contact with the utility's customer contact centre. As with other performance measures, Toronto Hydro is exploring opportunities for continuous and sustained improvement on this measure, thus enhancing the value of service delivered to its customers.

5. Billing Accuracy

Every year, Toronto Hydro issues about 5.1 million electronic and paper-based bills to approximately 730,000 customers. Similar to the First Contact Resolution, Billing Accuracy is a measure that has not been tracked by the OEB prior to this year's rollout of the LDC Scorecard. For the purposes of 2013 reporting and given the novelty of this measure, utilities were given an opportunity to define the Billing Accuracy measure in the manner that provides the most meaningful assessment of their performance. In measuring billing accuracy, Toronto Hydro gauges its ability to effectively set up, maintain, and retrieve on an ongoing basis all billing inputs needed to produce a bill. These activities can be broken down into two main areas:

a) Success in obtaining actual meter read data in a timely manner; and

b) Ensuring that meters, meter configurations, rate classes, pricing, customer transactions and other factors that impact the accuracy of the bill are set up and processed accurately, in a timely manner, and are properly maintained.

Accordingly, Toronto Hydro measures Billing Accuracy using a composite approach comprised of two distinct but complementary metrics:

- Percent of Actual Meter Reads Obtained (displayed on the 2013 Scorecard);

- Percent of Bills Cancelled (described for additional context below).

Toronto Hydro measures Percent of Actual Meter Reads Obtained as the combined actual meter readings received by Toronto Hydro's four meter data collection systems, divided by the total number of expected meter reads. The percent of actual meter reads obtained is a weighted average of the four systems, weighted based on number of meters in each system. In 2013, Toronto Hydro was able to obtain Customer Meter Reads 96.6% of the time.

The Percent of Bills Cancelled measure is calculated by comparing the number of all cancelled bills due to an error by Toronto Hydro in a month, versus the aggregate number of completed bills in the same month. The calculation excludes customer-initiated cancels (such as a failure of the customer to provide move notification in a timely manner). In 2013, Toronto Hydro cancelled 1.65% of the bills it issued to its customers in the course of the year.

Toronto Hydro notes that starting October 1, 2014, the OEB is implementing a standard definition of billing accuracy for all distributors, which will not align with the definitions and results provided n this update. Accordingly, the Billing Accuracy results reported on this Scorecard will not be comparable to the 2014 results on the next edition of Toronto Hydro's LDC Scorecard.

6. Customer Satisfaction Survey Results

The Results of a Customer Satisfaction Survey is another new measure introduced by the OEB for the purposes of the Scorecard. As with most other newly introduced measures, the utilities were allowed to define the measure themselves, but were not required to submit the results for the inaugural edition of the Scorecard. Toronto Hydro is not submitting results for this measure in the 2013 reporting year. The utility is in the process of investigating the customer satisfaction survey is best suited for the purposes of the LDC Scorecard. Consistent with OEB guidance, Toronto Hydro expects to submit the results of a Customer Satisfaction Survey for the purposes of the next edition of the Scorecard.

Safety

7. Public Safety Measure.

The OEB is still in the process of determining the suitable parameters for this measure in cooperation with the Electrical Safety Authority (ESA). As such, there are no reporting requirements associated with this measure for 2013. Toronto Hydro takes public safety in the vicinity of its distribution equipment very seriously, and regularly carries out activities such as proactive contact voltage scans on street-level assets, taking prompt corrective action where potential public safety issues are identified.

System Reliability

8. Average Number of Hours that Power to a Customer is Interrupted.

The average duration of outages experienced by Toronto Hydro customers in 2013 has significantly increased from the prior year, from 1.46 hours to 17.81 hours. The vast majority of this increase is attributable to two weather events that had a major impact on the utility's system and its customers, namely the July 8-9, 2013 major rainstorm and the December 21-26 ice storm. Both events left significant portions of Toronto Hydro's customers without power for an extended period of time. In both instances, Toronto Hydro moved to restore service to its customers as quickly as possible, providing regular updates through a variety of media channels.

When controlling for the impact of these major events, outages on the provincial transmission grid, and scheduled outages, Toronto Hydro's 2013 average outage duration statistics have been showing a stable trend over the last five years. This trend is attributable in part to infrastructure renewal investments that the utility has made during that period to address a major portion of its assets that have surpassed and/or are rapidly approaching the end of their useful lives. Going forward, and as described in detail in the Distribution System Plan filed with the OEB as a part of the utility's 2015-2019 Custom Incentive Regulation (CIR) rate application, Toronto Hydro needs to continue making significant investments into its aging distribution system to maintain reliability and safety, modernize the grid and support Toronto's urban growth.

Following the December ice storm, Toronto Hydro engaged an independent expert panel to examine the utility's response to this major weather event. The panel released its final report on June 18, 2014, generally endorsing Toronto Hydro's response to the weather event, and providing a series of recommendations for further improvements. Toronto Hydro is in the process of assessing these recommendations – some of which have already been implemented – and is developing an action plan for implementation that considers all recommendations in the report. It should be noted that many of the recommendations require significant resources and, consequently, factors such as funding, cost benefit analysis, customer impact and environmental impact will have to be carefully considered.

9. Average Number of Times that Power to a Customer is Interrupted.

Similar to outage duration, the average number of times Toronto Hydro customers experienced an outage in 2013 has also increased from 1.47 times in 2012 to 2.39 times in 2013. As with the outage duration measure, a predominant driver for this negative trend is the impact of the July 2013 rainstorm and the December 2013 ice storm. When controlling for the impact of these major events, outages on the provincial transmission grid, and scheduled outages, Toronto Hydro's average outage frequency statistics have been showing a stable trend over the last five years. This trend is attributable in part to infrastructure renewal investments that the utility has made during that period to address a major portion of its assets that have surpassed and/or are rapidly approaching the end of their useful lives. Going forward, and as described in detail in the Distribution System Plan filed with the OEB as a part of the utility's 2015-2019 Custom IR rate application, Toronto Hydro needs to continue making significant investments into its aging distribution system to maintain reliability and safety, modernize the grid and support Toronto's urban growth.

Asset Management

10. Distribution System Plan Implementation Progress

The progress of the distribution system plan implementation is a new performance measure instituted by the OEB starting in 2013. Consistent with other new measures, utilities were given an opportunity to define it in the manner that provides the most meaningful assessment of their performance. Toronto Hydro measures the progress of its Distribution System Plan implementation as a ratio of total capital expenditures made in a calendar year over the total amount of OEB-approved capital expenditures for that calendar year. Given the dynamic, dense, urban environment in which Toronto Hydro operates, a number of issues emerge over the

course of the year that require the management to postpone, re-prioritize or otherwise amend the capital work plan adopted at the start of the year. The measure excludes capital funding for special projects (such as Copeland Transformer Station currently under construction in downtown Toronto).
Toronto Hydro deems its year-end results to be successful if the year-end results are within a +/- 20% deadband from the approved amount. Toronto Hydro notes that it has recently submitted to the OEB a five-year application for electricity rates for the 2015-2019 years, which includes a comprehensive five-year distribution system plan prepared in accordance with the OEB requirements. Based on the outcomes of this future proceeding, Toronto Hydro may consider revising its approach to this particular measure in the future years.

Cost Control

11. Efficiency Assessment
The OEB assesses distributor efficiency using a comprehensive econometric benchmarking study that compares each utility's actual total costs, to the average efficient levels predicted by the model. While Toronto Hydro endorses the importance of sophisticated quantitative assessment of utility efficiency, in the utility's view the current methodology used by the OEB does not optimally assess efficiency performance of a utility of Toronto Hydro's size, location, and asset base. This is primarily due to the fact that the sample of utilities included in the OEB's assessment is limited to Ontario-based LDCs only. In Toronto Hydro's view, the operating conditions and the ensuing cost pressures facing its Ontario peers are in many ways different in scale, scope and nature to those experienced by the utility. Accordingly, Toronto Hydro believes that a more optimal assessment of its efficiency involves expanding the sample of observed utilities beyond Ontario, to include other large North American utilities, such as those serving Chicago, New York, Boston, San Francisco and other major U.S. metropolitan centres.
In Toronto Hydro's view, an econometric efficiency study based on a combined Ontario-U.S. sample balances n important objective of maintaining relevance with Ontario's regulatory and economic conditions, with the need to conduct an "apples to apples" comparison that includes other utilities similar to Toronto Hydro. The utility has filed such an econometric study as a part of its 2015-2019 CIR rate application to the OEB. This econometric benchmarking study produced by a third-party expert compares Toronto Hydro's total cost performance against that of 156 Ontario and U.S. utilities, including all Ontario LDCs. Based on this assessment, Toronto Hydro's total cost performance is in the top 13% for comparable U.S. utilities and in the top quartile – or 30th – out of 156 Ontario and U.S. utilities. The study, along with the remainder of the CIR rate application, is subject to OEB review.

12. Total Cost per Customer
In 2013, Toronto Hydro's total cost per customer was $924, or $24 higher than the 2012 result. The cost per customer increase is consistent with Toronto Hydro's ongoing operating activities and capital work to replace, refurbish and modernize the utility's aged distribution plant, connect new customers in one of the fastest growing North American cities, and modernize the grid through the use of emerging technologies. Toronto Hydro notes that its Total Cost per Customer results as calculated by the OEB do not account for an estimated 352,000 multi-unit dwelling residents occupying buildings that are meter by a single "bulk" meter. Adding these residents into the calculation would significantly reduce Toronto Hydro's unitized total cost result. In addition, Toronto Hydro understands that the calculation of total costs of the purposes of this analysis (the numerator) follows a methodology used by the OEB's external quantitative analysis consultant.

13. Total Cost per Km of the Line
In 2013, Toronto Hydro's Total Cost per Km of Distribution Line was $66,793, or $1,520 higher than the 2012 results. As with Total Cost per Customer measure, Toronto Hydro's higher expenditures are driven by the cost of the utility's operating activities and capital program to address the utility's aging asset base, connect new customers and modernize the grid. Toronto Hydro notes that this measure as calculated by the OEB does not account for the presence of a unique and expansive downtown underground network of secondary (lower-voltage) wires that provides an enhanced reliability to Toronto's downtown customers. Unlike the ordinary secondary wires used to connect individual buildings to the distribution system, which are typically excluded from total line length calculations, Toronto Hydro's secondary network is unique in its size and span in Ontario and performs a function similar to that of higher-voltage primary lines that comprise the calculation. Including the length of the downtown underground secondary network into the Total Cost per Line Km calculation would result in a lower unitized cost. In addition, Toronto Hydro understands that the calculation of total costs of the purposes of this analysis (the numerator) follows a methodology used by the OEB's external quantitative analysis consultant.

Conservation & Demand Management

14. Net Annual Peak Demand Savings (Percent of Target Achieved)
As at the end of 2013, Toronto Hydro's 2013 Net Annual Peak Demand Savings amounted to 32.70% of the OEB-mandated target. A comprehensive description of Toronto Hydro's conservation program results for the year 2013 will be provided in the utility's 2013 Conservation and Demand Management Annual Report expected to be submitted to the OEB at the end of September 2014.

15. Net Cumulative Energy Savings (Percent of Target Achieved)
As at the end of 2013, Toronto Hydro's 2013 Net Cumulative Peak Demand Savings amounted to 99.8% of the OEB-mandated target. A comprehensive description of Toronto Hydro's conservation program results for the year 2013 will be provided in the utility's 2013 Conservation and Demand Management Annual Report expected to be submitted to the OEB at the end of September 2014.

Connection of Renewable Generation

16. Renewable Generation Connection Impact Assessments Completed On Time
A Connection Impact Assessment is a detailed technical study that a utility must undertake prior to connecting all new qualifying sources of supply to its electricity network. The study ensures that generators seeking connection can be safely accommodated on the system, without having an adverse impact on system reliability for the existing customers. In 2013 Toronto Hydro completed 239 of such studies following requests by

connecting customers. In every case, the eligible studies were completed within the timelines specified by the Distribution System Code. The 100% result in 2013 constitutes a 9% improvement from the 2012 results due to process enhancements and dedicated interconnection team.

17. New Micro-Embedded Generation Facilities Connected on Time
In 2013 Toronto Hydro successfully connected 159 solar micro generation facilities, all of which were connected within the 5-day timeline, or as negotiated with individual proponents, in accordance with the Distribution System Code provisions.

Financial Ratios

18. Liquidity: Current Ratio
The financial performance measures reflected in the related Scorecard are in compliance with the OEB's methods of calculation for the purposes of electricity sector regulation in Ontario. These methods are not consistent with generally accepted methods of calculating similar financial ratios or are not based on the financial amounts reflected in the audited financial statements filed with the Ontario Securities Commission.

For analysis of the financial performance of Toronto Hydro Corporation, including that of the utility, please refer to the Management Discussion & Analysis available at www.torontohydro.com.

19. Leverage: Total Debt to Equity Ratio
The financial performance measures reflected in the related Scorecard are in compliance with the OEB's methods of calculation for the purposes of electricity sector regulation in Ontario. These methods are not consistent with generally accepted methods of calculating similar financial ratios or are not based on the financial amounts reflected in the audited financial statements filed with the Ontario Securities Commission.

For analysis of the financial performance of Toronto Hydro Corporation, including that of the utility, please refer to the Management Discussion & Analysis available at www.torontohydro.com.

20. Profitability: Regulatory Return on Equity
The financial performance measures reflected in the related Scorecard are in compliance with the OEB's methods of calculation for the purposes of electricity sector regulation in Ontario. These methods are not consistent with generally accepted methods of calculating similar financial ratios or are not based on the financial amounts reflected in the audited financial statements filed with the Ontario Securities Commission.

For analysis of the financial performance of Toronto Hydro Corporation, including that of the utility, please refer to the Management Discussion & Analysis available at www.torontohydro.com.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 15:

Reference(s): Exhibit 2B, Section C, Distribution System Plan

Preamble:

Page 13 Lines 1-7 describe THESL's intention to automate the data collection and processing for its MAIFI index.

a) Please describe the work that will be necessary to automate the calculation of this index along with the estimated cost of doing so.
b) Please explain why an automated system may yield materially different MAIFI performance compared to the present manual system.

RESPONSE:

a) The requisite work would entail developing a standard for sensors capable of logging momentary events and integrating them across the system into Toronto Hydro's SCADA infrastructure. Following the completion of this work, the actual calculation of MAIFI would then be performed in the manner similar to SAIFI or SAIDI from a formulaic point of view. At this point, Toronto Hydro is evaluating a number of potential solutions and does not have a firm cost estimate for work.

b) Toronto Hydro expects that the automated system may increase the precision MAIFI performance tracking relative to the present manual system. Under the current arrangement, momentary outage occurrences are manually entered into the ITIS. There are situations where operators may not have complete visibility into certain

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parts of the system and therefore, may not record all momentary events. Municipal stations (MS) which are not equipped with SCADA capability are one example of Toronto Hydro's limited visibility into certain parts of the system which are served by these stations.

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INTERROGATORY 16:

Reference(s): Exhibit 2B, Section C, Distribution System Plan

Preamble:

Pages 17-18 describe THESL's proposed metric to track Planning, Engineering and Support Staff efficiency.

a) Does THESL employ consultant or contract labour to perform any of the Planning, Engineering and Support Staff functions?

b) If yes, how does THESL plan to account for those costs in the proposed metric?

RESPONSE:

a) and b)

Yes. Toronto Hydro employs consultants and contract labour to assist with Capital Planning, Engineering and Support functions. These costs are included in the proposed metric.

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INTERROGATORY 17:

Reference(s): Exhibit 2B, Section C, Distribution System Plan

Preamble:

Page 20 describes THESL's proposed metric for Supply Chain Efficiency. Lines 12-14 note that the On Cost service charge is applied to a capital project as a percentage of the project's total costs.

Please explain why a charge against the total costs of the project is a more appropriate method of allocating warehousing costs than a charge against just the value of the materials used on the project.

RESPONSE:

Toronto Hydro's allocation methodology for warehousing costs is applied to all materials issued to both capital and operating projects. Exhibit 2B, Section C, page 20, lines17-24 provides a more detailed description of the allocation of warehouse costs.

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INTERROGATORY 18:

Reference(s): **Exhibit 2B, Section 00, Distribution System Plan**
Exhibit 2B, Section C, Distribution System Plan

Preamble:
Page 26 of the first reference shows a chart of historical actual spending on Capital over the period 2010-2013. Expenditures are relatively the same, around $450 M in all years except 2012 which had only $288 M. Page 21 of the second reference shows the On Cost rate for warehouse cost recovery which is also relatively consistent around 12%.

Given the significantly lower amount of capital undertaken in 2012 though, one would expect that the On Cost rate for that year would have been considerably higher than years in which capital expenditures were much higher in order to recover the relatively fixed costs of warehousing operations. However, the rate in 2012 was only 13%. Please explain.

RESPONSE:
The on cost did not rise in proportion to the approximately 35% drop in capital plan from 2011 to 2012 due to two reasons.

Starting in 2012 Toronto Hydro implemented a process change to purchase material on behalf of its contractors, driving an increase to material issued through the warehouses that offset a large portion of the decrease due to lower capital work volumes. This process change was driven by several objectives, including facilitating consistent

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materials quality across Toronto Hydro's capital program, meeting supplier volume thresholds, and ensuring optimal materials prioritization.

Moreover, in early 2012 Toronto Hydro offered a voluntary exit package to its employees, which was accepted by a number of warehouse staff members, leading to a decrease of costs.

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INTERROGATORY 19:

Reference(s): Exhibit 2B, Section C, Distribution System Plan

Preamble:

Pages 30-31 describe THESL's Stations Capacity Availability. The chart on page 31 shows the number of stations at or exceeding 90% capacity.

a) Please provide the specific stations that are at or above 90% capacity along with the normal capacity rating of the stations. According to the evidence the metric is based on switchgear and/or bus capacity. For stations with more than one bus, how is the metric defined. (e.g., If a station has two busses both of which are at or above 90% capacity, would that result in a count of 2 in the stations metric or just 1?)
b) If the busses are owned by HONI are they included in the count for this metric?
c) How many transformer stations in the THESL system are covered by this metric?
d) Line 8-10 states that the "metric drops from 2012 to 2013 primarily as a result of load transfer projects…." According to the chart the metric appears to be the same (5) for both years. Please explain where the drop is indicated.

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RESPONSE:

a) The table below shows the specific stations accounted for in the metric.

Year	Monitoring Period	Stations with Peak > 90% Capacity within 5 Years	Station Capacity in MVA (as of 2014)
2009	2010 - 2014	Esplanade	207
		Manby	238
		Runnymede	117
2010	2011 - 2015	Esplanade	207
		Manby	238
		Runnymede	117
		Terauley	240
2011	2012 - 2016	Ellesmere	199
		Horner	192
		Runnymede	117
2012	2013 - 2017	Fairbank	192
		Gerrard	39
		Horner	192
		Manby	238
		Runnymede	117
2013	2014 - 2018	Fairbank	192
		Horner	192
		Manby	238
		Runnymede	117

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Year	Monitoring Period	Stations with Peak > 90% Capacity within 5 Years	Station Capacity in MVA (as of 2014)
		Strachan	186

The metric is based on the coincident total station peak load and the total station capacity across all busses located at a station. A station with multiple busses exceeding 90% load will only count as "1" for this metric, and even then only if the sum of the peak load across all busses exceeds 90% of the sum of the capacity across all busses.

b) Yes.

c) All 36 transformer stations (including Copeland TS) are included in this metric.

d) This is a typo. The line should read "metric drops from 2010 to 2011 primarily as a result of load transfer projects…" In the data presented in part a), instances of stations dropping of the list are a result of load transfer projects undertaken to address station bus loading.

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INTERROGATORY 20:

Reference(s): Exhibit 2B, Section D3, Distribution System Plan

Preamble:

Lines 10-13 on page 2 of this exhibit read as follows:

"Interaction points include the fact that capital investment programs are informed through their associated cross-referencing maintenance programs, to ensure that capital investment program spending is above and beyond the life extension benefits produced from the maintenance programs."

This statement is difficult to interpret. Please explain what it means.

RESPONSE:

This reference refers to the fact that Toronto Hydro's capital and maintenance programs have been designed to complement each other in maximizing asset life and cost efficiency. Toronto Hydro's maintenance programs are designed to maximize the lifespan of assets, while Toronto Hydro's capital investment programs are designed to target and mitigate those issues that are above and beyond the scope of maintenance programs.

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INTERROGATORY 21:

Reference(s):

Exhibit 2B, Section D3, Distribution System Plan

a) The footnote on page 14 states that "The OEB also acknowledged that refining the FIM inputs may only come at significant cost." The actual statement by the Board in its April 2, 2013 Partial Decision in EB-2012-0064 on page 21 regarding the FIM reads:
"While the Board expects that it will continue to be refined, the Board notes that the level of detail sought by some of the intervenors may only be available at significant effort or cost."
Has THESL taken this statement to mean that it does not need to refine the customer outage cost assumptions used in the FIM?

b) Has THESL done any work to refine and validate the assumed customer costs of $30 per KVA and $15 per KVA – hour as well as the use of peak load on the feeder rather than the actual load at the time of the outage? If yes, please provide details of the work done. If not, does THESL have plans to do any such work in the future?

RESPONSE:

a) No. Please see the response to interrogatory 2B-AMPCO-13, part c.

b) Toronto Hydro continues to use the CICs and feeder loading assumption presented in EB-2012-0064. The reference in part a) of this response discusses Toronto Hydro's plans to refine and validate CICs. With respect to loading data, Toronto Hydro

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continues to explore opportunities to improve and enhance asset-level loading data. Also, please refer to response to Interrogatory 2B-AMPCO-13 part (b) for a discussion of the refinement and validation of other FIM inputs.

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INTERROGATORY 22:

Reference(s): Exhibit 2B, Section D3, Distribution System Plan

Preamble:

Pages 29-30 discuss the Asset Risk cost in the Business Case Evaluation analysis. Figure 9 on page 30 shows graphically the various components of costs used in the analysis. Line 20-21 on page 29 states that "For an existing Asset, the AR does not include capital cost since this is a sunk cost that has been already incurred."

a) Does the Asset Risk for a new asset include its estimated capital cost?
b) Is the Annualized Risk Cost of a new asset (orange line in left hand panel) equivalent to the Risk Cost of an existing asset (red line in right hand panel)? i.e., do they both include the same sorts of risks or are there differences in what is included.
c) If the two are equivalent, please provide an example that would help explain why the AR line in the right hand panel is illustrated with a much steeper slope than the ARC line in the left hand panel.

RESPONSE:

a) No. The annualized asset risk cost is added to the annualized capital cost to compute the life cycle cost of the new asset as explained in Exhibit 2B, Section D3.1.2.1(i), pages 14 to 15, and illustrated in Figure 4 on page 15.

b) Both the annualized risk cost of a new asset and the risk cost of an existing asset include the same type of risks. However, given that the left and right panels deal with

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different assets, the magnitude of risk contributed by each asset is different as it depends on the intrinsic nature of the asset.

c) Figure 9 is an example calculation. In this example, it is assumed that an intervention of replacing an existing asset with a new standardized asset is undertaken. The asset properties under the new standard may be slightly different. For the purpose of this example, it is assumed that the new standard is more reliable. This difference in risk is illustrated by a steeper slope on the right hand panel than that on the left hand panel.

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INTERROGATORY 23:

Reference(s): Exhibit 2B, Section D3, Distribution System Plan

Preamble:

Pages 30-31 describe the Non Asset Risks that are a factor in the cost of ownership in the BCE analysis. Lines 3-5 on page 31 state "The overhead System and the Underground System experience differing outage causes because the non-asset factors that affect an overhead system are different from those that affect an underground system."

a) Does THESL have situations on its system where the Overhead System supplies an Underground System?
b) If yes, how does THESL account in its BCE for an underground project for the Non Asset Risk arising from the Overhead System that supplies the underground system?

RESPONSE:

a) Yes, Toronto Hydro does have situations on its system where overhead infrastructure supplies downstream underground infrastructure.

b) Figure 10 in Section D3.3.2.4 of Toronto Hydro's Distribution System Plan (Exhibit 2B, Page 33, Figure 10) illustrates how the difference in cost of ownership between the existing assets to be replaced (COO_E) and the new assets to be installed (COO_N) is calculated as part of the business case evaluation ("BCE") process. As part of this subtraction, only the net difference in non-asset risks ("NAR") is considered as part

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of the BCE calculation, and the NAR calculation is only performed for the specific area of study.

In the case of an underground project that is supplied by overhead infrastructure, only the project area would be evaluated as part of the NAR calculation. Given that the non-asset risks associated with the supplying overhead infrastructure would not be changed by the project (i.e., the overhead supply infrastructure outside the project area is not part of the project), it would not be considered as part of the BCE process.

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INTERROGATORY 24:

Reference(s): Exhibit 2B, Section D3, Distribution System Plan

Preamble:

Page 31 discusses the Maintenance Cost component of the Cost of Ownership in the BCE analysis. Lines 11-12 state "when a program results in a net reduction in the amount of maintenance required for a system…. This change contributes to the difference in the COO, which in turn is shown as a benefit of the program."

a) Please provide a chart showing those capital programs that result in a net reduction in the amount of maintenance required for the system along with the estimated annual savings in maintenance costs associated with the program.
b) Are there programs that result in an increase in annual maintenance costs? Please describe them and provide an estimate of the annual maintenance costs required to support them.

RESPONSE:

a) The table below summarizes the annual maintenance savings by program that were captured as part of the business case evaluation (BCE) process:

Program Name	Annual Maintenance Savings ($M)
Rear Lot Conversion	$ 0.03
Box Construction	$ 0.10

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The above table includes a correction to the maintenance savings associated with Rear Lot Conversion. Due to this correction, the associated business case evaluation results for Rear Lot Conversion have been updated in Tables 1 and 2 below.

Table 1: Cost of Ownership of Status Quo

Business Case Element	Cost (in Millions)
Status Quo/Existing State of Infrastructure	
Asset Risk **[AR_E]**	$3.48
Non Asset Risk **[NAR_E]**	$23.62
Maintenance Cost **[MC_E]**	$0.60
Additional Quantifiable Benefits **[AQB_E]**	$0
Cost of Ownership of Existing Assets **[COO_E]**	$27.70

Table 2: Rear-Lot Conversion Program Business Case Evaluation (BCE)

Business Case Element	Cost (in Millions)
Option 2:	
Asset Risk **[AR_N]**	$1.73
Non Asset Risk **[NAR_N]**	$0
Maintenance Cost **[MC_N]**	$0.07
Additional Quantifiable Benefits **[AQB_N]**	$0
Cost of Ownership of New Assets **[COO_N]**	$1.80
Option 2: Project Net Benefit (NPV_2)	
Difference in Cost of Ownership [**ΔCOO_2** = (COO_E - COO_N)]	$25.90
Program Cost **[PC_2]**	$21.30
Program Net Benefit [$NPV_2 = (\Delta COO_2 - PC_2)$]	**$4.60**

It should be noted that there may be further maintenance savings that are identified with respect to certain investments that are not quantifiable at present time. These

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savings would be further identified and quantified as part of continuous improvements contained within the "measurement & enhancement" element within the AM Planning Process, as defined in Section D1.2.4 of Toronto Hydro's Distribution System Plan (Exhibit 2B, Section D1, page 16).

b) Yes, the Downtown Contingency program (Exhibit 2B, Section E7.7) is expected to increase the maintenance cost of the new state. The program introduces new tie points between feeders by installing new overhead switches. These new switches are expected to contribute extra maintenance cost of approximately $1,600 per switch over a three-year cycle. Please refer to Exhibit 2B, Section E7.7 for more details.

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INTERROGATORY 25:

Reference(s): Exhibit 2B, Section D3, Distribution System Plan

Preamble:

Section D3.3.2.3 on page 31 discusses Additional Quantifiable Benefits as a factor in the Business Case Evaluation.

a) Please provide an example of where operational efficiency savings are realized.
b) Are there also Additional Quantifiable Costs that might be associated with a program? If so, please provide examples and indicate how these are accounted for in the BCE process.

RESPONSE:

a) The Underground Legacy Infrastructure program is an example of where operational efficiency savings are realized. Toronto Hydro plans to conduct the asset replacement efficiently when installing a safer cable chamber cover by salvaging the covers that have been replaced for scrap value and thus realizing financial savings and an efficient disposal of the obsolete assets by diverting it away from the landfill.

b) No, there are no Additional Quantifiable Costs associated with any program. All costs associated with the program are inherently captured in the program cost.

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INTERROGATORY 26:

Reference(s):

Exhibit 2B, Section D4, Distribution System Plan (corrected)

Preamble:

Lines 7-11 on page 9 discuss the possibility of new developments in IT affecting THESL's five year investment plan for IT. Lines 9-11 state "The five-year Investment Plan could be affected if Toronto Hydro determines that any of these technologies would be beneficial to its operations or would maximize the value of its IT assets."

a) Does THESL seek a flexible approach for how it spends its Board approved IT budget e.g., Substituting a different technology for one funded in the budget with no change in overall spending level? Or, does it seek the flexibility to amend its overall spending level on IT during the five-year CIR period?
b) If the latter, how would THESL propose to obtain Board approval for a material change in its IT spending level?

RESPONSE:

a) Toronto Hydro seeks a flexible approach for how it spends its OEB-approved IT budget. Please refer to Exhibit 2B, Section D4, pages 8 and 9 for more information about why Toronto Hydro requires flexibility with respect to the execution of its IT capital plans.

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b) Toronto Hydro expects that any changes to its overall spending level on IT during the five-year CIR period will be reviewed in the context of its next rebasing application.

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INTERROGATORY 27:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 5 of the Kinectrics 2014 Asset Condition Assessment Audit states that "underground cable testing has not yet started" but "Progress is being made with regard to the preferred type of testing".

a) Please explain the types of cable testing being considered along with the pros and cons of each.
b) If cable testing has not yet started, please explain how THESL has determined what cables to replace and what ones to conduct maintenance on.
c) When does THESL expect to conduct the pilot project referenced on the page?

RESPONSE:

a) The types of cable testing considered along with the pros and cons of each are discussed in the report attached to the response to Interrogatory 2B-SEC-32.

b) Toronto Hydro's cable testing program is still in the pilot stage. Currently, all cable segments selected for replacement are replaced based on age, installation type and failure history of the cable. Once cable testing is established, Asset Management engineers will be able to use the test results in conjunction with cable age, installation type and failure history. This will help better prioritize future cable replacement projects.

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c) Toronto Hydro expects to complete its pilot project in 2014.

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INTERROGATORY 28:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 5 also references enhancements to the BI calculator and notes that THESL has completed "Modification of calculation method to ensure that the correct age of an asset is used in the assessment".

Please explain how the calculation method impacts the correct age of an asset. i.e., isn't the age of the asset in the database already and therefore an input to the BI calculator?

RESPONSE (PREPARED BY KINECTRICS):

Typically, asset age is already stored in the asset registry Ellipse. Enhancements were made to the calculation method in the BI calculator to identify and, if possible, address such situations where asset age data is incorrect or blank. For example, if asset age for a particular asset is not identified in Ellipse, the BI calculator will now estimate the asset age based on other available information, such as installation year, equipment manufacture year or purchase date.

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INTERROGATORY 29:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 6 notes that recommendation 6 of the Kinetrics 2011 audit has not been implemented by THESL. Specifically, "The Health Index formulas presented in the 2011 audit have not been incorporated into the BI or Interim Calculators…"

a) Why did Kinectrics recommend using the new formulas? How do they differ from the old ones?
b) Please explain why THESL has not incorporated the formulas as recommended by Kinetrics.
c) What errors or inaccuracies are introduced to the BI or Interim Calculators by using the old formulas?

RESPONSE:

a) **Prepared by Kinectrics** – The formulas currently used by Toronto Hydro are single-tiered formulas. The formulas recommended are two-tiered formulas. Condition parameters are the asset characteristics that are indicative of asset condition. The two-tiered condition parameter differs from the single-tiered parameter in that it can generally be thought of as a component or a sub-system of the asset. The two-tiered condition parameter may be a composite of several sub-condition parameters, each of which is an indicator of the condition of its parent parameter.

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b) There are two main reasons why Toronto Hydro has not yet implemented the Kinetrics formulas:

1) The Kinetrics formulas require considerably more inspection data than formulas currently used by Toronto Hydro, some of which are not currently collected during inspections. Given that there is a finite budget for maintenance inspections and there is an inspection cycle that needs to be met for all asset classes, a higher inspection budget would be needed to accommodate the Kinetrics formulas. For example, the Air Blast Circuit Breaker asset class currently uses five inspection criteria for the ACA calculation. The suggested Kinetrics formula calls for twenty one inspection criteria, of which eight are not currently collected.

2) Some data required by the Kinetrics formulas that are not currently collected by Toronto Hydro during the inspection process would require the equipment to be de-energized for collection. This would impact service to Toronto Hydro customers. An example can be found in the switchgear asset class, where an inspection parameter for the Kinetrics formula, "physical condition of the assembly", would require the switchgear to be de-energized to safely perform the inspection. One of Toronto Hydro's core values is to minimize service interruptions to its customers, and including this type of inspection parameter would not be consistent with this value.

c) **Prepared by Kinectrics** – The formulas currently used by Toronto Hydro do not introduce errors or inaccuracies. They just do not have the incremental benefits of the two-tiered system, as outlined above in part a.

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INTERROGATORY 30:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 11 shows a chart of population changes for various assets including 3 phase overhead remotely operated switches at –94%. This is explained on page 8 as the result of a misclassification of many manually operated switches as remotely operated switches.

a) Has the dramatic decrease in the number of remote switches been reflected in a decreased switch maintenance budget i.e., no motor operator, no radio or Scada interface to maintain?
b) If yes, please provide details. If no, please explain why not.

RESPONSE:

a) The misclassification stated in the question has had no impact on Toronto Hydro's switch maintenance budget. The two asset classes involved in the population change are 3-phase overhead gang-operated manual switches and 3-phase overhead gang-operated motorized switches, which are both not capable of remote operation. Please see Toronto Hydro's response to Interrogatory 4A-EP-39 for more information.

b) The work elements of the Maintenance programs for 3-phase overhead gang-operated manual switches and 3-phase overhead gang-operated motorized switches are different, but the scope of work and associated planned labour hours per unit for both switch types are identical. The two switch types described above have many common

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components, including insulators, lightning arresters, arc interrupters, blades, contacts, hinges and linkage mechanisms. As such, many of the planned maintenance tasks associated with the two switch types are common. The difference between the switches is at the operator level; for a manual switch, the linkage mechanism is extended further down the pole, and is connected to an operator handle and locking mechanism. For a motorized switch, the linkage mechanism is connected to a motor and control mechanism. The work elements associated with verifying manual handle function in comparison to motor mechanism function are different, but the time taken to execute the tasks is the same. As a result, there is no required change to the switch maintenance budgets.

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INTERROGATORY 31:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 13 notes that Station Power Transformers and Station Switchgear experienced significant declines in health indices from 2012.

Please explain the reasons for the declines over the past two years.

RESPONSE:

a) Power Transformers

The main reason for the deteriorating trend is the fact that power transformers are continuing to age beyond their typical useful life (45 years); 51.6% (or 128) of the power transformer units in-service are beyond this age. Ageing and worsening inspection/test results have both contributed to the overall trend.

b) Switchgear

Station switchgear experienced significant declines in health indices from 2012 to 2014 primarily due to the effects of asset ageing. Additionally, some of the change in health indices can be attributed to improvements made to the health index calculator tools and increased data availability for the asset class since the 2012 study. In 2014, Toronto Hydro's health index calculator generated a score for 89% of the population of station switchgear in service compared to only 33% in 2012. The improvements (which did not involve any modifications to the underlying health index formulas)

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mainly involved correcting errors in the underlying algorithms, which enabled the calculator to utilize more of the available asset inspection data to provide a more accurate representation of asset condition.

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INTERROGATORY 32:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Page 14 notes that pad-mounted transformers have experienced a decline of 43% in those considered very good compared to 2012.

a) Please explain the reasons for this significant decline.
b) Does THESL expect the condition of padmounted transformers to continue to decline as rapidly?
c) What measures are being taken to counteract the decline in condition?

RESPONSE:

a) The health index ("HI") score for padmounted transformers is driven by several factors including:
    - age and condition of bushings
    - oil leaks
    - corrosion
    - transformer lid gasket
    - barriers
    - grounding
    - concrete base
    - IR scan

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- latches and
- handles.

As these are outdoor assets, they are exposed to varying environmental factors.

The age breakdown of 'very good' TXPAD assets by age in 2012 ACA report is:

- 2,809 – less than 20 years old
- 728 – 20 to 29 years old
- 491 – 30 to 39 years old
- 142 – 40 to 49 years old
- 592 – unknown age

The above age breakdown demonstrates that in 2012 a considerable number of padmounted transformers were older than 20 years, but had HIs in the 'very good' range. Considering that the 'useful life' of padmounted transformers is 35 years and with two years of additional age, a significant decline in condition is not unexpected. Furthermore, the Kinetrics report also mentions that: "Despite this downward trend, no distribution transformers are classified as "poor"/"very poor".

b) Toronto Hydro plans to closely monitor the condition of this asset class, but does not expect the decline to continue as rapidly

c) Refer to the following narratives that address planned capital work for padmounted transformers:

- Exhibit 2B, Section E6.1 (Underground Circuit Renewal)
- Exhibit 2B, Section E6.3 (Underground Legacy Infrastructure)

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INTERROGATORY 33:

Reference(s): Exhibit 2B, Section D, Appendix A

Preamble:

Section 6 of the audit report contains recommendations by Kinetrics.

Please indicate which recommendations THESL intends to adopt and which ones it does not intend to adopt along with reasons for the decisions.

RESPONSE:

The following table summarizes the recommendations from Kinetrics and Toronto Hydro's plans:

Recommendation	Toronto Hydro Intentions
"Continue validating and modifying BI Calculator so that it may be used in subsequent Asset Condition Assessments"	Toronto Hydro plans to continue validating and modifying the BI calculator in the future. These tasks will be done through future ACA audits, both externally (similar to those done for 2012 and 2014 reports) and internally (Asset Management Project Planning groups).
"Revise Calculation method for Stations Power Transformers"	Toronto Hydro is currently in the process of updating asset owner records that will allow HI calculations to be done automatically by the ACA tool.
"Include revised HI formulations for Network Vaults and Network	At this time, there are no plans to implement these revised HI formulations, but they could be

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Recommendation	Toronto Hydro Intentions
transformers"	implemented in the future.
Include Network Protectors	Network Protector asset class was actually included in the interim excel-based ACA calculator for the 2014 audit. Toronto Hydro plans to include this asset class in the online BI calculator as a future enhancement.
"Include underground cables"	Once Toronto Hydro determines a reliable and cost-effective method of testing underground cables, it is anticipated that an underground cable asset class will be added to the ACA tool
"Complete BI Calculator enhancements currently underway"	Toronto Hydro has taken steps to implement, test and validate the enhancements listed in the 'Recommendations' section in 2014. Such examples include filtering by asset owner and improved overhead switch classification
"Continue to improve sample sizes for every asset category"	Toronto Hydro will continue to improve sample sizes for every asset category. This task will be accomplished through continuing to ensure that assets of each asset class are inspected within their respective inspection cycles. Toronto Hydro will also continue training inspection staff to ensure that consistent and usable inspection data is collected. Note that the 2014 ACA audit notes a substantial improvement in sample sizes for almost all asset classes when compared to the 2012 ACA audit, and can be attributed in part to those reasons listed above.
"Examine the root cause of decline in asset health"	Toronto Hydro plans to examine the root cause(s) of the general decline in asset health. This task will be done by auditing the inspection data for various asset

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Recommendation	Toronto Hydro Intentions
	classes for completeness of inspection data (improving sample size for more accurate representation of asset class health), and to find patterns in inspection data that could reveal the causes of the decline in asset health.
"Review timing and pacing of system renewal investments based on the trend in asset health. Particular attention be given to Station Assets"	Toronto Hydro already takes into consideration ACA results when establishing timing and pacing of station renewal investments.
"Review timing and pacing of system renewal investments based on the trend in asset health. Particular attention be given to Vault Transformers, Network Vaults, Wood Poles"	Toronto Hydro already takes into consideration ACA results when establishing timing and pacing of vault transformer, network vault and wood pool investments.
"ATS: it is recommended that this asset category be removed from future assessments and audits"	Toronto Hydro agrees with this recommendation and plans to remove this asset class from the ACA tool, as it will be fully removed from the distribution system in the near future.
"Overhead Remote Switches be removed from future assessments and audits"	Toronto Hydro agrees that the small number of this asset type does not warrant an ACA asset class and plans to remove it from future assessments.
"Consider adopting the recommended HI formulations presented in the Kinetrics 2010 Audit"	There are two main reasons why Toronto Hydro has not yet implemented the Kinetrics formulas: 1) The Kinetrics formulas require considerably more inspection data than formulas currently used by Toronto Hydro and some of this data types are not currently collected during inspections. Given that there is a finite budget for maintenance inspections and there is an inspection cycle that needs to be met for all asset classes, a higher

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

Recommendation	Toronto Hydro Intentions
	inspection budget would be needed to accommodate the Kinetrics formulas. For example, the Air Blast Circuit Breaker asset class currently uses five inspection criteria for the ACA calculation. The suggested Kinetrics formula calls for twenty one inspection criteria, of which eight are not currently collected. 2) Some data required by the Kinetrics formulas that are not currently collected by Toronto Hydro during the inspection process would require the equipment to be de-energized for collection. This would impact service to Toronto Hydro customers. An example can be found in the switchgear asset class, where an inspection parameter for the Kinetrics formula, "physical condition of the assembly," would require the switchgear to be de-energized to safely perform the inspection. One of Toronto Hydro's core values is to minimize service interruptions to its customers and including this type of inspection parameter would not be consistent with this value.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 34:

Reference(s): Exhibit 2B, Section E1

Preamble:

Table 4 on page 14 shows forecasted distributed generation connections by type and year to 2019. In the combined heat and power section the forecast ranges between 24 MW and 39 MW up to 2018 but in 2019 the forecast is for 104 MW.

Please explain the large increase in forecast connections for CHP in 2019.

RESPONSE:

The increase in forecast connections for CHP in 2019 is due to a large DG proposal in the Toronto area. A proponent has proposed a combined heat and power project in the 90MW range in the Central and Downtown area of Toronto. The large capacity of this proposed project has resulted in a significant increase in the projected combined heat and power connections in the year 2019.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 35:

Reference(s): Exhibit 2B, Section E1

Preamble:

Table 5 on page 16 shows DG peak operation forecasts by type and year to 2019. The forecast for combined heat and power in 2019 is 6.9 MW which is roughly 50% of the forecast for the prior years.

a) Please explain why the forecast for 2019 is so much lower than other years particularly in light of the connection forecast of 104 MW.
b) Please explain how peak operation forecasts for DG are arrived at.

RESPONSE:

a) The DG peak operation forecast in 2019 is lower than in previous years as a result of a large proposed combined heat and power project of 90 MW. Due to the large size of this project, it will be connected to the transmission grid rather than the distribution system as with other typical combined heat and power projects. Accordingly, metering of the large DG project will be transmission based as compared to typical DG systems which are distribution based. As such it will displace peak load on the transmission system rather than the distribution system and was thus filtered out of the 2019 Peak Operation Forecast for CHP in Table 5. The forecast CHP for 2019 of 6.9 MW has been based on projected distribution connections which may further increase depending on program initiatives, customer needs and technological advancements.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

b) The peak operation forecasts are arrived at by taking into account operating, maintenance, contingencies and other in-service conditions of the aggregate DG capacity connected to the distribution system. The wide varieties of DG sources typically operate below their maximum rating. For the many DG connections distribution system peak load displacement is in the order of half of the connected capacity of DG. This is due to the cumulative effects of DG operating characteristics and other in-service conditions in relation to distribution system peak load conditions. The peak operation coincident factor was applied to existing, projected and proposed DG connections.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 36:

Reference(s): Exhibit 2B, Section E5.4

Preamble:

Page 22 of the schedule notes at lines 25-27 that work at George and Duke MS must be completed in 2015 to avoid a "scheduled road moratorium that will prevent work from occurring in the area for a five year period".

Please explain what circumstances have caused the City to impose a five year moratorium on road work in the area.

RESPONSE:

According to the City of Toronto's Public Utility Coordination Committee, Adelaide Street West from Yonge Street to Sherborne Street will undergo major road resurfacing in 2017. The road resurfacing would place a five-year road moratorium on Adelaide that will prevent non-emergency road cuts. George and Duke MS's civil egress from the station is located along Adelaide Street West and would be affected by this road resurfacing.

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INTERROGATORY 37:

Reference(s): Exhibit 2B, Section E8.1

Preamble:

Charts on page 22 show graphs of Maintenance cost for vehicles vs. age and vs. odometer readings.

These charts appear to be totalized for the entire fleet. Because light vehicles might differ significantly from heavy vehicles in repair and maintenance costs it would be helpful to have the two shown in separate graphs. Please provide charts similar to those on page 22 but separated into light and heavy vehicle categories.

RESPONSE:

Separated graphs for heavy and light duty vehicles are shown on the following pages:

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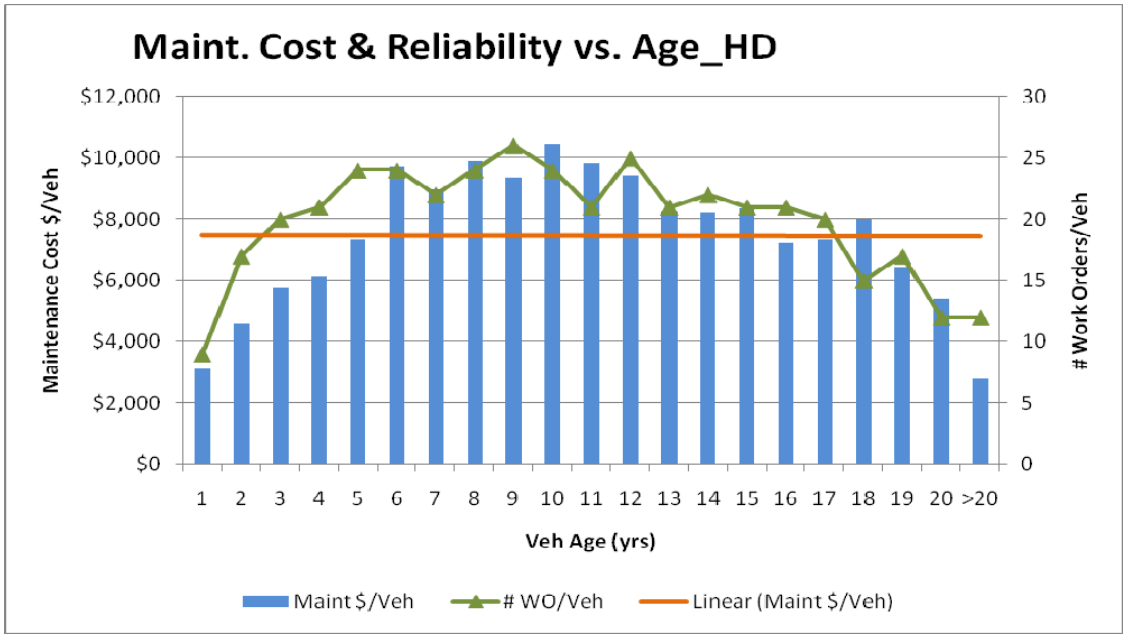
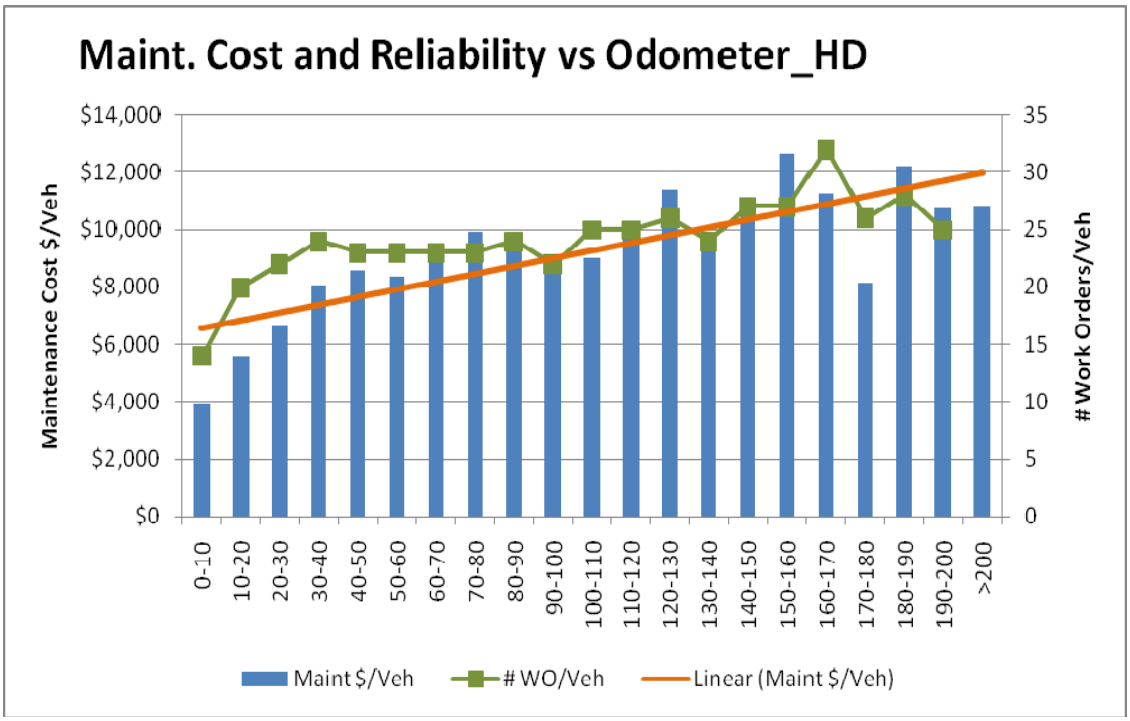
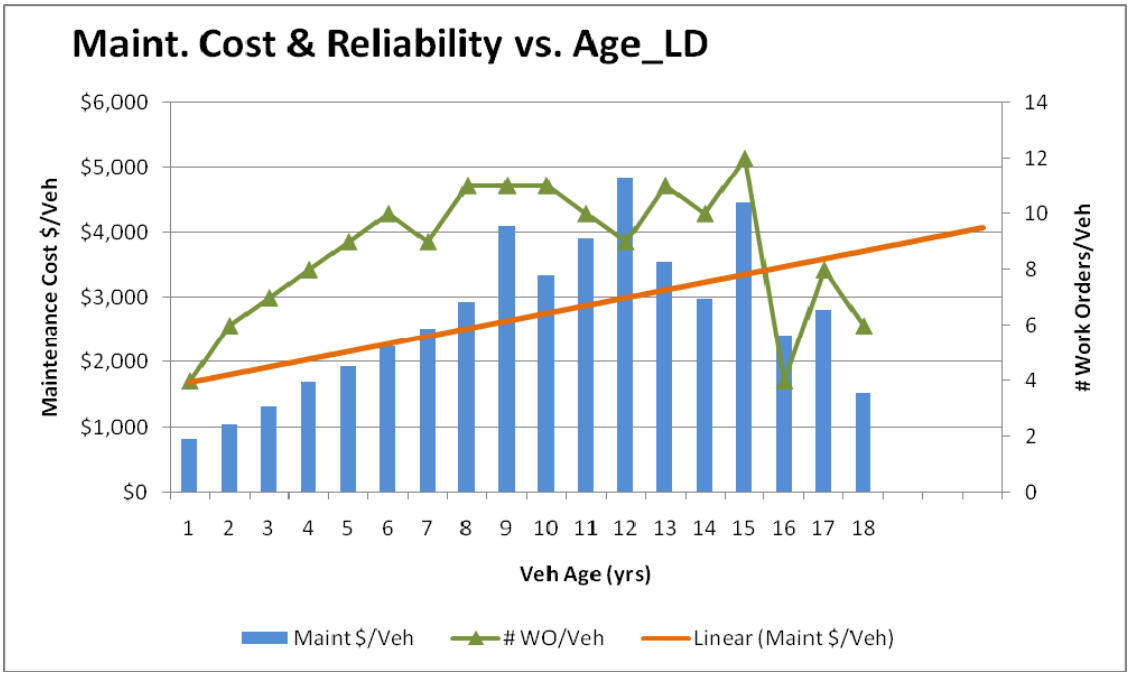
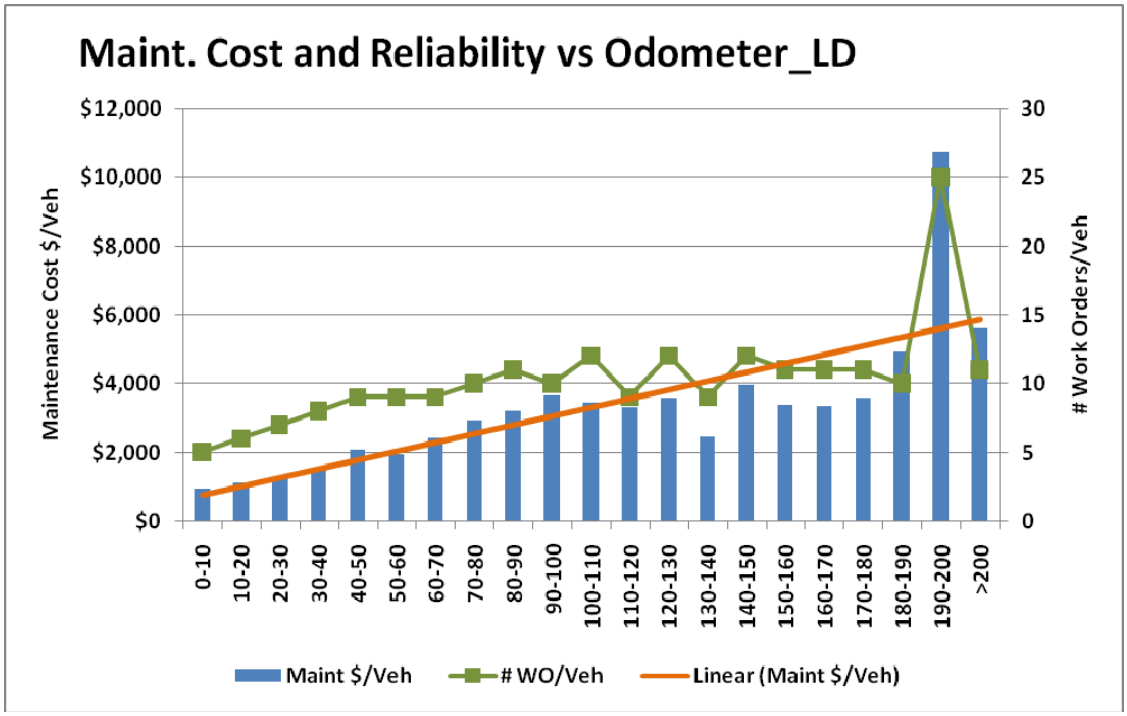




RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES





RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 38:

Reference(s): Exhibit 2B, Section E8.2

Preamble:

Lines 26-28 on page 16 of the schedule describe the need to perform a structural review at 60 Eglinton Ave. to ensure building integrity and identify any issues.

a) The fact that the building is 60 years old appears to be the triggering factor for this review. Is this age a common criterion for building structural review? If so, please provide references. If not, please explain why that particular age has prompted the need for such a review.
b) Has THESL experienced any problems with the building that would lead it to suspect structural issues? If yes, please provide details.
c) What is the budgeted cost for this review?

RESPONSE:

a) Structural components of a building are depreciated over a 50- to 75-year period and fail over time. Building Assessments performed by structural engineers is a form of due diligence by a building owner. See also response to (b).

b) The structural review at 60 Eglinton is not being done in reaction to a known problem. The review is a proactive form of due diligence to better understand the condition of the building. It is common practice in facility maintenance to study the structural components of a building as they approach their end of life.

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c) As shown in Table 10 of Exhibit 2B, Section 8.2, Toronto Hydro has budgeted approximately $20,000 for the 60 Eglinton structural review.

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INTERROGATORY 39:

Reference(s): **Exhibit 4A, Tab 2, Schedule 1**
Exhibit 2B, Section D, Appendix A

Preamble:

On page 17 of the first reference 3 phase gang operated switches are noted in lines 2-3 are noted as "not capable of remote operation". On page 8 of the second reference 3 Overhead Remote switches are mentioned.

a) Are these Overhead switches part of the gang operated category of switches?
b) Is the term "Remote" meant to indicate that the switch can be operated from the control room?
c) If yes, please explain the statement in Reference 1 that such gang operated switches are not remotely operable.
d) If no, please explain what the term Remote is intended to convey

RESPONSE:

a) Yes, overhead switches mentioned in the second reference are part of the gang-operated category of switches mentioned in the first reference.

The term "gang-operated" generally refers to load break switches that are designed to open and close all three electrical phases of a feeder simultaneously. Toronto Hydro's gang-operated switches may be:

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1) Manual: the actuation mechanism is manual, and is operated through a handle at the switch location. As such, it is not capable of being operated from the control room.
2) Motorized: the actuation mechanism is motorized, and is operated via a control mechanism at the switch location and is also not capable of being operated from the control room.
3) SCADA Controlled: the actuation mechanism is motorized, and can be operated via the control mechanism at the switch location, and remotely from the Control Room via the SCADA system.

b) Yes, the term Remote is meant to indicate that the switch can be operated from the Control Room. However, the switches in question (Overhead Remote switches as described in Exhibit 2B, Section D, Appendix A, page 8) are not capable of remote operation and therefore should not have been labelled "Remote."

c) Please refer to the response in part b.

d) Not applicable.

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INTERROGATORY 40:

Reference(s): Exhibit 4A, Tab 2, Schedule 1

Preamble:

Page 28 of the exhibit states that trees surrounding feeders are pruned "once every two to five years, with the system average being approximately three years".

a) Is the term "surrounding" meant to be taken literally? i.e., Are only the lines that actually run directly through the tree canopy trimmed on average every three years or is 3 years the average trimming cycle that THESL experiences for its lines?
b) If the latter, has THESL compared its vegetation management practices with other distributors to determine if its trimming cycle can be lengthened? If yes, what differences did it identify that contribute to the more frequent trimming cycle in THESL.
c) On page 32, reference is made to the expected loss of approximately 860,000 Ash trees to the emerald ash borer. Has THESL investigated the merits of asking the City to replant with species more compatible to overhead lines i.e., those that do not grow quickly and do not reach a height that can interfere with power lines?

RESPONSE:

a) The term "surrounding" is not only meant for the lines that actually run directly through the tree canopy, but also includes the trees that are immediately adjacent or exceed minimum clearance distances to overhead primary feeders, as specified in Toronto Hydro Standards. Currently, trees are trimmed every two to five years (with

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an overall system average of approximately three years) to ensure the safety and reliability of the distribution system.

b) Toronto Hydro does review and compare its vegetation management approaches and practices to the approaches and practices of other distributors and other forestry operations (e.g., transmitters, municipalities, and utility contractors). One avenue for doing so is Toronto Hydro's participation with CEATI International's Distribution Assets Life Cycle Management (DALCM) Interest Group and T&D Vegetation Management Task Force (VMTF). Information obtained through such avenues is one set of inputs that is used to assess whether the frequency of tree trimming activities at Toronto Hydro should be increased or decreased. Currently the average cycle is generally comparable to those of other utilities. However, this information is not a primary driver for Toronto Hydro planning decisions. Primary drivers are reliability, safety, and financial considerations as discussed in Exhibit 4A, Tab 2, Schedule 1.

In terms of comparing Toronto Hydro's trimming cycle to the cycles of other utilities, a noteworthy difference is that Toronto Hydro utilizes a risk-based approach for scheduling trimming that considers various factors including reliability while other utilities use a fixed cycle. Toronto Hydro's approach results in some feeders (in areas of dense tree canopy and higher tree contact incidents) being trimmed every two years, while other feeders (in areas of lower density tree canopy and fewer incidents) being trimmed every five years. This is considered a best practice in the industry.

c) Toronto Hydro is currently in discussions with the City of Toronto regarding a tree planting standard that has been developed by the utility which identifies guidelines

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and dimensions for the planting of trees in proximity to the primary distribution system.

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INTERROGATORY 41:

Reference(s): Exhibit 4A, Tab 2, Schedule 1

Preamble:

At various pages of the Exhibit reference is made to oil testing of equipment to comply with PCB Regulations.

a) What are THESL's obligations under the regulations to identify and eliminate PCB contaminated equipment from its system?

b) What are the estimated costs and timelines to accomplish that objective?

RESPONSE:

a) Toronto Hydro is obligated to comply with the requirements contained in the *PCB Regulations*, SOR/2008-273 under the *Canadian Environmental Protection Act, 1999* (S.C. 1999, c. 33). Those obligations include prohibitions contained in sections 14, 15, and 16, specifically, not using:

   i) equipment containing PCBs in a concentration of 500 mg/kg or more after December 31, 2009; and

   ii) equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg after:

      - December 31, 2009 if the equipment (excluding pole-top transformers) is located within 100 m of a sensitive location (i.e., a drinking water treatment plant, child care facility, etc.); or
      - December 31, 2025 if the equipment is located at any other place.

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b) During 2015-2019, Toronto Hydro's estimated OM&A costs are $0.5 million annually to inspect and test equipment for the purposes of complying with the *PCB Regulations* (Exhibit 4A, Tab 2, Schedule 1, page 4). These costs are expected to be incurred as a part of the Preventative and Predictive Maintenance Program, specifically, the Below-Grade Equipment, Pad-Mounted Equipment, and Customer Location Maintenance segments. Equipment that is found to contain PCBs in concentrations that exceed 50 mg/kg would be replaced through an appropriate capital program.

Timelines planned for the PCB-related activities coincide with the December 31, 2025 deadline contained in the *PCB Regulations* and Toronto Hydro expects to sustain these activities until 2025.

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INTERROGATORY 42:

Reference(s): Exhibit 4A, Tab 2, Schedule 3

Preamble:

On page 15 of the schedule footnote 10 states that "Toronto Hydro proposes to allocate a portion of the revenue received by TH Energy from the City of Toronto for street lighting maintenance and operation to exactly offset the revenue requirement impacts arising from the transfer".

a) Please describe the process by which TH Energy revenue from the City of Toronto is reallocated to THESL to offset revenue requirement arising from the transfer of street lighting assets.
b) Does the revenue requirement include maintenance, operations, depreciation and return on capital components or just the maintenance and operations components?
c) How much does THESL estimate the revenue requirement offset from this source will be in 2015?
d) The footnote states that there will be no overall change in the 2015 Revenue Requirement resulting from these assets being included in rate base. Does the same hold true for 2016-2019?

RESPONSE:

a) The process by which TH Energy revenue from the City of Toronto was reallocated to THESL entailed: 1) a calculation of the revenue requirement impact, as detailed in

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Exhibit 2A, Tab 5, Schedule 1, pages 19 - 22; and 2) a corresponding revenue offset forecast, as noted in Exhibit 3, Tab 2, Schedule 1, page 2, lines 19-23.

b) Yes, the revenue requirement includes maintenance, operations, depreciation and return on capital components. Please refer to Exhibit 2A, Tab 5, Schedule 1, page 22, Table 7 for a breakdown of the revenue requirement calculation.

c) As noted in Exhibit 2A, Tab 5, Schedule 1, page 22, Table 7 and Exhibit 3, Tab 2, Schedule 1, page 2, lines 19-23, Toronto Hydro estimates the revenue requirement offset to be $8.1 million in 2015.

d) Toronto Hydro's rate proposal for 2016-19 is for mechanistic rate changes based on the Custom PCI index, as described in Exhibit 1B, Tab 1, Schedule 3.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 43:

Reference(s): Exhibit 4A, Tab 2, Schedule 3

Preamble:

Table 6 on page 18, shows actual and forecast costs for major event and storm damage restoration. Given the very large cost in 2013 and the theme of increasingly violent weather events that appears throughout the evidence, it would seem optimistic to forecast costs based solely on the average of three years and excluding the 2013 major event costs.

Is it THESL's intention to deal with extreme weather event damage that exceeds the average by way of Z factor relief or is it prepared to accept the risk and absorb unexpected damage costs?

RESPONSE:

As detailed in Exhibit 1B, Tab 1, Schedule 1, extreme weather events such as storms may give rise to a request for Z-factor relief. Whether or not Toronto Hydro seeks such relief in relation to an extreme weather event will depend on the specific circumstances of the event, including the magnitude of the incurred costs.

Please also see Toronto Hydro's response to interrogatory 3-BOMA-23.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 44:

Reference(s): Exhibit 4A, Tab 2, Schedule 4

Preamble:
This schedule describes THESL's need for a Disaster Preparedness Management Program. Table 1 on page 1 shows expenditures in 2009 of $0.9 M.

a) Was this expenditure related to the G20 conference referenced later in the exhibit? If not, please explain what the expenditure was for.
b) Was any of the planning undertaken in 2009 useful for the proposed Disaster Program discussed in the exhibit? If yes, please provide details of what can be used.

RESPONSE:

a) Based on the evidentiary reference provided, Toronto Hydro infers that Energy Probe is referencing the $0.9 million in expenditures incurred in 2011, rather than 2009 as the question states. The referenced figure covered the costs of a four-person team primarily tasked with emergency management work. Expenditures incurred at this time were not related to the 2010 G20 summit.

b) Toronto Hydro leveraged the documentation produced in 2011 in preparation of the current program's structure and objectives. The available documents, including governance framework drafts and program maturity assessments provided the foundation for the Disaster Preparedness Program as proposed in this application.

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INTERROGATORY 45:

Reference(s): Exhibit 4A, Tab 2, Schedule 4

Preamble:

Table 3 on page 25 shows $1.55 M for full time staff.

a) Please provide details of the number of employees included in this budget along with their position titles and job descriptions.
b) Given that Board approval may not be forthcoming on this application until the spring of 2015, is it reasonable to expect that staff can be recruited to the full extent of the budget in 2015? If not, what would be a reasonable expectation for staffing in 2015?
c) Is it reasonable that training, exercise and audit activity costs should be deferred until 2016 or later in light of the expected timeline for Board approvals and the lag inherent in establishing the program before downstream activities like these would be undertaken?
d) THESL notes at the outset of the discussion that some disaster planning has always been part of its activities. How much should be acknowledged as already embedded in rates for disaster planning activities?
e) Does THESL have an estimate of how much quicker or less costly the 2013 storm response would have been if it had its proposed disaster preparedness program in place at that time?
f) If yes, please provide details of how restoration could have proceeded more quickly or more cost effectively. If no, what evidence or analysis does THESL have that the proposed program would provide value to customers for the cost incurred?

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

RESPONSE:

a) Comparisons to industry peers indicate that a utility of Toronto Hydro's size should have at least eight dedicated full-time employees to manage all facets of the disaster and emergency management program. The group would consist of one Director and seven Emergency / Disaster Management Professionals. Please see the attached position descriptions (Appendices A and B).

b) Toronto Hydro plans to commence filling these positions following the anticipated implementation of the new rates in May 2015. Accordingly, the pace of the proposed 2015 expenditures would be in line with the incremental funding provided for through the requested budget.

c) Given the nature of these activities, Toronto Hydro does not believe that deferring them would be reasonable or desirable.

d) The current level of available rates funding used for the Disaster Preparedness Activities amounts to approximately $0.3 million.

e) No.

f) For a discussion of the value provided by a comprehensive Disaster preparedness Program, please see the Independent Review Panel Report assessing Toronto Hydro's response to the 2013 ice storm (Exhibit 4A, Tab 2, Schedule 5, Appendix A).

POSITION PROFILE

Position Title: Emergency Management Program Consultant

Position Objectives

- To provide research and operational support and advice to the Director, Emergency Management in the development of Toronto Hydro's Emergency Preparedness and Business Continuity Plans.
- To support the continued delivery of key services to the residents of Toronto in the event of an emergency or critical event.
- To ensure that Toronto Hydro is prepared for an emergency by assisting in response activities and coordination during an emergency and/or potential emergency and by providing support to the Manager, Emergency Management

POSITION PROFILE

Key Responsibilities

Toronto Hydro is a key employer in the City of Toronto and provides critical infrastructure services to its clients. As a result, Toronto Hydro has an obligation to ensure the safety and protection of its employees, protect its assets in an emergency situation and ensure that its services are available as quickly as possible to citizens after an emergency. It is within this context that the position performs the following duties:

1. Supports the Manager, Emergency Management, in the development and implementation of Toronto Hydro's Emergency Management and BCP Program to ensure the organization can respond quickly and effectively to any emergency situation that may affect operations, employees and/or services to clients. Maintains a list of managers responsible for acting as emergency management leads and backups by identifying those contacts and ensuring the most current information is available.
2. Assists the Manager in assessing threats and risks to the continuity of Toronto Hydro operations, including monitoring and analyzing potential threats against staff, infrastructure and programs. Identifies risks to the Manager to help prevent emergencies that could cause harm to Toronto Hydro, its employees or assets. Works with all Business Unit Business Continuity Planning (BCP) leads to guide them through the entire BCP process, including the development and implementation of BCP plans and procedures for all critical processes, as well as the development of an organizational "umbrella" Business Continuity Plan. Reviews emergency plans and Business Continuity Plans and provides recommendations for improvement and/or compliance with applicable legislation and/or standards.
3. Liaises regularly with City of Toronto's Office of Emergency Management (OEM), Emergency Management Ontario (EMO), the Independent Electricity System Operator (IESO) and various other stakeholders and government (federal, municipal, regional) organizations to exchange information. Represents the Manager at various committees and meetings as required.
4. Assists the Manager with Toronto Hydro's emergency exercises and drills by developing inputs and scenarios, organizing, coordinating and participating in the conduct of exercises and drills.
5. Assists with the development and delivery of training in emergency management and business continuity planning to designated employees and managers within Toronto Hydro on how to respond to emergencies or contingency situations.
6. Works with the Manager, Emergency Management on the development of communication plans and materials, including managing and disseminating information. Coordinates communication activities related to the emergency management and BCP programs. Researches, designs and drafts communications materials for use in explaining Toronto Hydro's position and efforts on emergency management, pandemic and business continuity planning. Researches and provides input to the development of procedures or best practices for emergency response and crisis situations. Provides technical support and research in the development of publications and/or awareness/education programs related to Toronto Hydro's emergency management program, including the development and maintenance of internal and external Emergency Management web pages.
7. Works with the Manager, Emergency Management on the design and coordination of mechanisms to evaluate program effectiveness and divisional performance.
8. Interprets related policies, procedures, guidelines, standards and/or collective agreements.
9. Provides operational support related to business continuity or emergency situations affecting Toronto Hydro and/or its customers by ensuring the functionality and preparedness of the Emergency Operations Centre (EOC), the System Operations Centre (SOC), and the Local Incident Command Centers (LICCs).
10. The position works with the Manager in coordinating all aspects of emergency management and business continuity activities, responding to emergencies/recovery operations and any related infrastructure, communications, personnel or city-wide need.
11. In case of an emergency, position may be required to work 24/7 (as required) to support the Emergency Operations Centre (EOC) or System Operations Centre (SOC).
12. **Safety Internal Responsibility System (IRS)**
    - Follow regulatory procedures
    - Follow employer's procedures
    - Engage in job planning with Crew Leader and/or Supervisor
    - Follow job plan
    - Identify defects, contraventions and dangers
    - Use initiative to reduce risk
    - Apply discretion to solve OH&S problems
    - Report unresolved problems
    - Work cooperatively with co-workers, crew leaders, supervisors and others

Knowledge Requirements

- Position requires knowledge of relevant acts, regulations and standards (Emergency Management and Civil Protection Act, CSA Z1600, etc…), as well as emergency management/business continuity principles to support ongoing emergency management and business continuity planning activities.
- The ability to manage small and large projects. Strong research, analytical, evaluation and problem solving skills to develop and recommend resolutions to complex problems and contentious issues.
- Knowledge of project management, time management and organization skills in order to coordinate communication activities, support the development of plans and policies and meet critical timelines and project deadlines. Analytical and research skills to assess compliance with relevant legislation, policies, conduct research and analyze data.
- Ability to work in a team environment. Good consultation, issues management and networking skills to consult with managers and staff. Advanced written and oral communication skills to prepare and present reports, papers, briefing material. Ability to facilitate the work of small groups and to develop and deliver presentations. Advanced ability with MS Office products. Ability to work in an independent and self-directed manner and as a member of a team under pressure to meet deadlines.
- Ability to undergo security checks successfully.
- Ability to work under stress during emergencies

POSITION PROFILE

Key Accountabilities (listed in order of importance)

- **Program:** Position is responsible for the provision of research and operational support related to emergency management and business continuity planning activities including: conducting research and providing input into the development of plans, procedures/best practices for emergency management and business continuity, designing and developing communication materials, providing advice to managers, analyzing data, reviewing emergency plans and business continuity plans and recommending improvement and/or compliance with applicable legislation and/or standards, maintaining a database of contacts, liaising with stakeholders/clients.
- **Material and Financial:** Development of costing and evaluation of various proposals tabled and has the ability to participate in the analysis of all financial aspects related to program delivery.
- **Personnel:** Responsible for project leadership of staff assigned to project teams and for monitoring of consultants' work. Provides assistance to new or less senior staff as required. May supervise students and/or consultants or seconded staff
- **Impact of Errors:** Failure to provide adequate operational support related to Toronto Hydro's emergency management and business continuity program could result in the inability to meet program objectives. Errors in judgment and provision of inaccurate information/research and issues/data analysis could have a critical impact on Toronto Hydro's ability to develop and implement effective Emergency Management and Business Continuity Programs in compliance with legislated requirements. Failure to resolve problems encountered in the delivery of Emergency Management and BCP programs will damage the credibility of the programs with other jurisdictions, and may affect delivery of services to persons in need.

Skill Requirements

Communication skills to deal with both internal and external stakeholders:

- **Internal:** Regular contact with Business Unit Emergency Management/BCP leads and Managers to provide service and advice on safe and secure operations within their areas of responsibility (Legal Services, Information Technology, Facilities, Communications, Human Resources, Finance). Regular consultation with all levels of management to develop and implement business continuity plans and procedures. Regular contact with all levels of staff to provide training and increase awareness of emergency preparedness and business continuity. Regular contact with City of Toronto's Office of Emergency Management, Emergency Management Ontario (EMO) and officials of other governments and agencies to seek advice and/or coordinate efforts; particularly those tasked with EM and BCP responsibilities.
- **External:** Position has regular contact with the IESO, occasional contact with governments (federal, municipal, provincial), external consultants and private sector organizations involved in the implementation of emergency management and business continuity at Toronto Hydro. Represents the Manager at select committees.

Judgment:

- Position exercises judgment in assessing compliance with related legislation, policies, procedures and standards and providing advice and guidance to managers. Position exercises judgment in conducting research in support of policy and program development; assisting in conducting risk assessments and analyzing data.
- Judgment is exercised in assessing the seriousness of problems, and in developing feasible solutions; simplifying complex technical data into concise, clear recommendations for Management; and in deciding and recommending which items require further study.
- Judgment is exercised in developing stakeholder/client information and training materials to be easily understood by stakeholders/clients. A high level of judgment is required to advise management during an actual emergency.

Behavioural & Leadership Requirements

Business Acumen:
Links long range visions and concepts to daily work; prioritizes work in alignment with operational goals

Coaching:
Acts as a resource and coaches to encourage employees to reach their full potential. Creates an environment where employees are inspired to a high level of performance. Encourages people to work together as a team to solve problems and develop innovative processes to increase customer satisfaction and reduce costs.

Conceptual Thinking
Sees “big picture”, identifies connections and patterns that are not obvious to others; timely identification of key issues and/or actions in complex and/or time-critical situations.

Collaborative Decision Making
Gathers and analyzes available information to arrive at appropriate resolution; seeks to understand the problem before implementing a solution; develops effective solutions to organizational problems

Customer Focused/Relationship Building:
Understands customer needs and expectations. Takes the extra steps to ensure customer understanding and satisfaction. Uses techniques to build teams and empower employees to strive to provide excellent customer service. Builds rapport; establishes relationships with colleagues and stakeholders

Leadership:
Lead change and possesses a sense of mission. Portrays an image that inspires action; determines behaviour and fuels motivation. Understands and utilizes the actions and behaviours necessary to create organizational change.

Self Awareness:
Recognizes and understands others moods, emotions and drives; knows ones strengths and limits. Understands the attitudes, interests, needs, and perspective of others.

POSITION PROFILE

Experience	Education	Scope Measure
✓ Must possess a minimum of 5 years direct experience developing/overseeing organizational emergency management and business continuity programs ✓ In-depth experience providing service in one or more of the following functions: emergency operations and incident support; developing emergency preparedness and business continuity plans; planning, developing and delivering training programs and exercises specific to emergency management and/or BCP; performing research, analyzing information and writing reports/policies/protocols	✓ Associate Business Continuity Professional (ABCP) designation required ✓ Post secondary degree, diploma or certificate in emergency management and/or business continuity planning, or a combination of equivalent related training and hands-on experience Certified Business Continuity Professional (CBCP) certification preferred Project Management certification would be an asset	

JOB PROFILE

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EB-2014-0116
Interrogatory Responses
4A-EP-45
Appendix B
Filed: 2014 Nov 5 (2 pages)

Job Title: Director, Grid Emergency Management
Department/Division: Electric Operations & Procurement
Reports To: Executive Vice President and Chief Electric Operations & Procurement Officer
Date Prepared: July 2014

Overall Job Purpose & Accountabilities:

Job Purpose: *(A **high level overview** of why the job exists and what it must accomplish:)*

Reporting to the Executive Vice President and Chief Electric Operations & Procurement Officer, the Director of Grid Emergency Management – Planning & Operations, ensures a sustained state of grid response readiness and proficiency as it relates to grid emergency management and field operations by directing the development, maintenance, and implementation of comprehensive grid emergency preparedness and business continuity plans that are fully integrated into all operational business units, and that are aligned with all relevant first responder, municipal, provincial and federal agencies.

S/he directs impact analysis associated with a variety of grid disruption scenarios (both in real time and forecasted) including grid equipment failures, natural disasters, and civil events and the development of engineering designs, tactical field operating plans, and risk mitigation strategies to effectively respond to those grid disruption scenarios. Moreover, s/he will be responsible to ensure the development and delivery of training for each of the specific roles and responsibilities within the organizations grid emergency preparedness and business continuity plans.

S/he will provide assume the role of Incident Commander / Deputy Incident Commander during declarations of emergency or significant events and may be required to work extended hours including 7 x 24 extended coverage and will also be the primary security interface with corporate security as it relates to grid operations.

% (of time spent on each responsibility)	Accountabilities: *(List **4-6 responsibilities and desired results** that enable the individual to achieve the objectives of the job)*
35%	Develops and implements the organizations Grid Emergency Preparedness and Business Continuity Plans. Directs the system and customer impact analysis necessary to develop engineering designs, tactical field operations plans, risk mitigation strategies and supply point contingency plans to effectively respond to a variety of scenarios including: transmission & distribution system equipment failures, weather related events, network failures / cascade, civil events (PAN/AM, G8/G20, Conventions, etc…), natural disasters (ice storm, floods, heat wave, tornadoes), security threats. Plans must be developed to include industry best practices and be pursuant to the regulations set forth by the Ontario Energy Board (OEB), the Independent Electricity System Operator (IESO), the North American Electric Reliability Corporation (NERC), the Emergency Plans Act of Ontario, and any and all other applicable Federal, Provincial, and/or Municipal legislation.
35%	Directs Local Incident Command Centre (LICC's) and field response strategies during grid disruption declarations of level II (or higher), or any grid disruption that attracts provincial, municipal, and/or local media coverage. S/he will develop national/international Mutual Aid Agreements with participating utilities and develop the necessary process and logistics systems to efficiently deploy or receive mutual aid. This position will assume the role of Senior Management Standby 7/24, 365, and will be responsible to ensure adequate field resources standby coverage across electric operations throughout the year, and act in the role of Deputy Incident Commander during declarations of emergency as required.
15%	Directs the design and delivery of tactical training plans and programs to directly responsible persons (DRP's) in their specific roles and responsibilities across electric operations as it relates to the organizations emergency preparedness and business continuity plans. S/he will also develop plans for, and conduct appropriate drills and practice drills to ensure a sustained state of readiness of all resources involved in decelerations of grid emergency response. S/he will be the primary contact for external Mutual Assistance requests and will also act as the grid security interface with corporate security.
15%	Champions grid disruption emergency management across the organization by providing timely recommendations to Executive Management that mitigate the corporations risk exposure and improve response capabilities and

JOB PROFILE

	effectiveness. Provide accurate reporting of operational performance. Coordinate the implementation of grid disruption plans with corporate risk management, other divisions within the organization, and across external agencies i.e. , Police, Fire, Ambulance, Utilities, Key Accounts, City Works, City EMO, Provincial EMO, etc…) Manages all intra-corporate and outbound information flows as they relate to emergency response.

Education and Experience:

Education (minimum)	Experience (minimum)	Work Conditions	Scope
• Bachelor's Degree in Engineering, Applied Science, or Business Management • Registered Professional Engineer • Graduate degree in Engineering or Business Management (preferred) • Emergency Management Certification (CEM, CDRP) (preferred)	• Ten (10) years broad experience in electric utility engineering & operations • Five (5) or more years experience in utility emergency response, planning, or management • Five (5) years progressive leadership experience	• Inside / Outside • Abroad (nationally/Internationally) • City Council / TEMPC • Ability to perform under pressure • Across all work centers	• 6-8 direct reports (Engineers/process mgmt) • Substantial impact to OPEX, Reliability, Customer Service/Brand • External EM prime • Incident Commander/Deputy Incident Commander • Dedicated Senior Management Standby

Knowledge, Skills and Competencies:

(List the specific knowledge, special skills and competencies required to fulfill the position objectives and accountabilities)

- Demonstrated understanding of general utility operations and interdependencies across business divisions
- Demonstrated understanding electric distribution systems, construction, maintenance & repair
- Demonstrated knowledge of applicable work practices, procedures, and safety requirements
- Demonstrated understanding of decision support technologies and systems
- Demonstrated understanding of the interdependencies across stakeholder agencies including Hydro One Control Operations, IESO, City of Toronto Emergency Management, Provincial Office of Emergency Management, Toronto Police Services, Toronto Fire Services, EMS, etc…).
- Demonstrated knowledge of the concepts, principals and strategies associated with Electric Utility emergency preparedness and tactical business continuity plans. Completion of the Emergency Measures Ontario curriculum and attainment of applicable emergency management certifications (CEM, CDRP)
- Excellent interpersonal skills with the ability to influence and communicate effectively both orally and in writing at all organizational levels and with external stakeholders. Completion of the Emergency Measures Ontario curriculum and attainment of applicable emergency management certifications (CEM, CDRP)
- Strong verbal and written communication skills
- Excellent analytical, process re-engineering, and project management skills
- Excellent problem solving, and decision making skills (particularly in emergency situations)
- Mature, seasoned business judgment

Key Performance Accountabilities: Direct impact on system reliability metrics specifically SAIDI, CAIDI, and KAWPF. Direct impact on emergency and reactive operational budgets. Direct impact on key account management, external brand quality, government relations and legislative compliance.

Toronto Hydro Core Competencies: [ ] Executive [x] Sr. Leadership [ ] Supervisor [ ] Professional [ ]Administrative/Support

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 46:

Reference(s): Exhibit 4A, Tab 2, Schedule 6

Preamble:

Page 5 discusses temporary service requests and notes that "Toronto Hydro provides firm quotations for these transactions, with any variance between actual costs of completing the project and the terms of a firm connection offer recovered through operating expenditures."

a) Please provide a variance summary for the past five years between firm price connection offers and actual costs.
b) Has THESL considered providing estimated connection costs with the proviso that the customer will be charged actual costs? If yes, what factors led it to choose firm price connection offers. If no, please explain why this would not be a good strategy to protect ratepayers from any impact on operating costs.

RESPONSE:

a) The table below contains a variance summary. Please note that in the aggregate actual connection costs have been somewhat less than the firm connection amounts quoted over the last five years:

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	2009	2010	2011	2012	2013
Variance[1] ($ millions)	$0.2	$0.0	- $0.2	- $0.2	- $0.3

[1] Variance = Actual Cost – Revenue from Firm Connection Offer

b) Toronto Hydro has considered alternatives to a firm quotation based on an estimate of actual cost. The firm quotation has been selected for two reasons. One, customers prefer the certainty that a firm quotation provides. This is particularly true in cases where the connection is complex and expensive, such as large development projects. For some projects, temporary connections can cost tens if not hundreds of thousands of dollars and unforeseen issues and contingencies can result in actual costs that are appreciably different than estimated costs. Second, a firm quotation results in a more efficient and administratively less burdensome process for both customers and Toronto Hydro. For example, there is no requirement for additional communication with respect to costs after the connection is completed.

Please note that for a subset of temporary service connections (i.e., temporary service install and remove – overhead) Toronto Hydro is seeking approval for a new specific service charge as discussed in Exhibit 8A, Tab 2, Schedule 1, pages 2 and 4. With the proposed service charge, Toronto Hydro seeks to charge a flat fee for this subset of connections as opposed to the firm quotation based on an estimate of actual costs currently used.

RESPONSES TO ENERGY PROBE RESEARCH FOUNDATION INTERROGATORIES

INTERROGATORY 47:

Reference(s): Exhibit 4A, Tab 2, Schedule 7

Preamble:

Table 3 on Page 7 of the schedule shows Planning and Records Management costs increasing from $5.5 M and $5.7 M in 2011 and 2012 respectively to $8.8 M in 2013, $8.7 M in 2014 and $9.0 M in 2015.

Please provide a more detailed explanation of why costs in this segment have increased about 60% over 2011 levels.

RESPONSE:

Planning and Records Management costs are proposed to increase to $8.7 million in 2015 from the $5.6 million and $5.7 million level in 2011 and 2012 predominantly due to the following:

- $1.6 million in new programs and pilot initiatives, the largest portion of which is made up of OM&A expenditures from the Local Demand Response Program discussed in Exhibit 2B, Section E7.10 (at page 36);
- $0.3 million in write-offs of design costs associated with capital projects that have been identified as no longer required due to changes in system needs;
- $0.3 million in contractor costs to support various functions (e.g., asset records management, utility circulations, maintenance planning);

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In addition to the above, the Planning and Records Management function is labour intensive with the majority of staff represented by the Society of Energy Professionals. Under the Collective Agreement with the Society, (Exhibit 4A, Tab 4, Schedule 1, page 7) which has been in effect since April 12, 2012 (and expires on December 31, 2015), base salary increases averaged 1.75% between 2012 and 2014 and are to be 2% in 2015 (Exhibit 4A, Tab 4, Schedule 5, page 10).

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INTERROGATORY 48:

Reference(s): Exhibit 4A, Tab 2, Schedule 11

Preamble:

Table 3 on page 7 of the schedule shows Facilities Maintenance Services will increase from about $10 M in 2012 and 2013 to $13.7 M in 2015 (an increase of about 35%. This increase is attributed partly to inflation and to the introduction of the Facilities Management Office "which has significantly increased the scope of facilities service available at Toronto Hydro…"

a) The FMO is presented as an efficiency improvement feature but costs appear to have increased significantly as a result of its implementation. Please explain in more detail how this new structure provides customer value for the cost incurred.
b) Please provide more detail on the "increased scope of facilities services" available through the FMO.
c) How were these services provided in the past before the advent of the FMO?

RESPONSE:

Preamble:

Toronto Hydro notes that the $13.7 million Test Year budget referenced in the question is based on Toronto Hydro's pre-filed evidence, which has been updated on September 23, 2014. As a result of the update, the Facilities Maintenance Services Segment OM&A Test Year budget has been reduced by $0.2 million, to $13.5 million. In 2012 the program staffing complement was reduced by approximately

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30% as a result of the Voluntary Exit Program. This reduction led to lower service levels for 2012 and 2013 (e.g., reduction in total maintenance tasks completed) and was not sustainable. The service levels were later restored through the introduction of the FMO in 2014, along with additional services described below.

a) The FMO business model provides customer value in a number of ways. First, the arrangement includes a common intake model for all facilities concerns, requests and issues for building occupants and the general public. This function reduces the time spent identifying an appropriate contractor to remedy an identified issue, thereby facilitating faster resolution of the issue at hand, and allowing Toronto Hydro staff to focus on core business activities. Moreover, as discussed in the Exhibit 4A, Tab 2, Schedule 11, in cases where issues arise with the equipment used to facilitate the utility's capital or maintenance programs (e.g., a warehouse lifting device), any delays caused by malfunctioning or non-compliant equipment can have a direct impact on Toronto Hydro's ability to provide and/or restore electricity service, thereby impacting customers. These risks are mitigated through a centrally managed intake system. Beyond streamlining the work identification and assignment process, the FMO arrangement allows the utility to centralize scheduling, tracking and record-keeping of all preventative and reactive maintenance tasks, which leads to faster and more efficient execution and enhances the planning process itself.

Moreover, the FMO arrangement provides efficiencies in freeing up internal resources that would otherwise be dedicated to invoicing, purchasing and contract management. As stated in Exhibit 4A, Tab 2, Schedule 11, the FMO provider is responsible for procuring, scheduling, and tracking the contract services that Toronto Hydro formerly sourced on an individual basis. Through the FMO, Toronto Hydro

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now manages and administers a single external facilities contract, passing the bulk of administrative work to the FMO, who sub-contracts the individual services. This arrangement significantly streamlines the process for Toronto Hydro's procurement and accounts payable functions, by eliminating the need for creation and processing of a large number of tenders, purchase orders, and invoices. In addition to the administrative efficiencies, external contract consolidation allows Toronto Hydro to leverage the size of the FMO tender to obtain more competitive prices and increase the efficiency of responding to unforeseen work requirements. Finally, the FMO arrangement has also facilitated the implementation of formal programs related to Designated Substance Surveys (DSS) and Asbestos Containing Materials (ACMs).

b) Increased scope includes a 24-hour call centre and a webform that dispatches internal or external workers immediately. It also includes a maintenance management system that keeps records of legislated maintenance tasks, tenant requests and corrective work orders. In addition to being a legal requirement, these records help Toronto Hydro analyze and justify maintenance activities where business cases may be required. The maintenance management system also automatically schedules the regular maintenance tasks, ensuring that maintenance workers' schedules are balanced and efficient, and all applicable activities are performed within the optimal timelines. Furthermore, the FMO provides an asset tagging and registration system that links tasks to the assets. This system allows Toronto Hydro to keep track of maintenance records and provides appropriate detail to analyze the replacement programs.

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c) Please see Exhibit 4A, Tab 2, Schedule 11, pages5-7 for the discussion of the previous approach to providing the services in question, along with the improvements introduced by the FMO arrangement.