EB-2017-0049

Hydro One Networks Inc.

2018-2022 Distribution Rates Application

AMPCO Compendium

Panel #1 – Custom IR

2. THE CUSTOM IR PROPOSAL

Hydro One's Application is based on a Custom Incentive Rate-Setting approach for a five-year period. The revenue requirement for the first year (2018) is determined using a cost of service, forward test year approach. To establish the annual revenue requirements from 2019 to 2022, Hydro One is proposing a Revenue Cap IR, whereby the revenue for the test year t+1 is equal to the revenue in year t adjusted annually by the revenue cap index (RCI).

The custom RCI is expressed as:

$$RCI = I - X + C$$

Where:

- "I" is the inflation factor, as determined annually by the OEB.
- "X" is the productivity factor that is equal to the sum of Hydro One's Custom Industry Total Factor Productivity measure and Hydro One's Custom Productivity Stretch Factor.
- "C" is Hydro One's Custom Capital Factor, determined to recover the incremental revenue in each test year necessary to support Hydro One's proposed Distribution System Plan, beyond the amount of revenue recovered in rates.

A detailed discussion of these components is found in Exhibit A, Tab 3, Schedule 2.

The proposed Revenue Cap IR model has several advantages over a Price Cap IR model. Specifically, the Revenue Cap IR:

- provides the needed flexibility to introduce new rate classes in 2021 to fully integrate Norfolk Power Distribution Inc., Haldimand County Hydro Inc., and Woodstock Hydro Services Inc. (together the "Acquired Utilities"), as described in Exhibit A, Tab 7, Schedule 1;

1.3 CAPITAL FACTOR

The Custom Capital Factor proposed in this Application and used in the RCI is designed to ensure that total revenue resulting from the Custom IR is able to meet Hydro One's specific circumstances arising from the proposed capital investments set out in Hydro One's DSP (Exhibit B1).

The Custom Capital Factor is the percentage change in the Total Revenue Requirement (line 11 of Table 1 below) attributable to new capital investment that is not otherwise recovered from customers. This includes depreciation, return on equity, interest and taxes attributable to new capital investment placed in-service each year of the Custom IR term. The Capital Related Revenue Requirement (line 6) each year is based on the change in rate base.

The calculation of the Custom Capital Factor ("C") is set out in Table 1 below.

The Total Capital Related Revenue Requirement metrics in lines 1 to 8 of Table 1 will be calculated by Hydro One in conjunction with the Draft Rate Order using Board-approved values. These metrics will not change over the term of the Custom IR, with the exception of the applied-for cost of capital update in 2021. The Total Revenue Requirement (line 11 of Table 1) will change annually, as a result of the annual adjustment to the Inflation Factor as it applies to OM&A and costs associated with the integration of the Acquired Utilities (line 10).

The OM&A (line 9) provided for each year in Table 1 is determined based on the 2018 forecast provided in the Application and increased by the Inflation Factor ("I") and reduced by the proposed Productivity Factor ("X"), for a total increase of 1.45% per annum.

Table 1: Summary of Revenue Requirement Components ($ Million)

Line		Reference	2018	2019	2020	2021	2022
1	Rate Base	D1-1-1	7,671.6	8,049.8	8,477.9	9,036.5	9,436.6
2	Return on Debt	E1-1-1	191.6	201.1	211.8	225.7	235.7
3	Return on Equity	E1-1-1	269.4	282.7	297.7	317.4	331.4
4	Depreciation	C1-6-2	392.6	413.5	428.6	448.1	463.0
5	Income Taxes	C1-7-2	61.5	64.7	66.4	72.7	72.7
6	Capital Related Revenue Requirement		915.1	962.0	1,004.5	1,063.9	1,102.8
7	Less Productivity Factor (0.45%)			(4.3)	(4.5)	(4.8)	(5.0)
8	**Total Capital Related Revenue Requirement**		**915.1**	**957.7**	**1,000.0**	**1,059.1**	**1,097.8**
9	OM&A	C1-1-1	584.8	593.3	601.9	610.6	630.4
10	Integration of Acquired Utilities	A-7-1				10.7	
11	**Total Revenue Requirement**		**1,499.9**	**1,551.0**	**1,601.9**	**1,680.4**	**1,728.2**
12	Increase in Capital Related Revenue Requirement			42.6	42.3	59.1	38.8
13	Increase in Capital Related Revenue Requirement as a percentage of Previous Year Total Revenue Requirement			2.84%	2.73%	3.69%	2.31%
14	Less Capital Related Revenue Requirement in I-X			0.88%	0.90%	0.91%	0.91%
15	**Capital Factor**			**1.96%**	**1.83%**	**2.78%**	**1.39%**

The 2018 Total Revenue Requirement of $1,499.9 million (line 11) is determined based on a forward test year, cost of service approach and is the rebasing year for this Application.

In 2019, the Capital Related Revenue Requirement (line 6) increases to $962.0 million versus $915.1 million in 2018. Hydro One will reduce the Capital Related Revenue Requirement (line 6) by the proposed Productivity Factor of 0.45% or $4.3 million (line 7), such that the Total Capital Related Revenue Requirement is $957.7 million (line 8). The change in Total Capital Related Revenue Requirement (line 8) in 2019 versus 2018 is $42.6 million (line 12). This difference is equal to 2.84% of the 2018 Total Revenue Requirement of $1,499.9 million ($42.6 million divided by $1,499.9 million).

The 2.84% increase in Total Capital Related Revenue Requirement is the total increase in revenue requirement arising from the higher 2019 Capital Related Revenue Requirement (line 6). However, the 2.84% increase must be offset by the increase in revenue requirement that results from the application of the Inflation and Productivity Factors (I - X) of the RCI. This is done by determining the percentage of the Total Capital Related Revenue Requirement (line 8) that is already provided for by the Inflation and Productivity Factors. In 2019, this equals 0.88% ($915.1 million x 1.45% / $1,499.9 million). The net result of 1.96% (2.84% less 0.88%) is the 2019 Custom Capital Factor. The calculation of the Custom Capital Factor for each of 2020 through 2022 is the same, as set out in Table 1 above.

1.4 REVENUE CAP INDEX SUMMARY

Table 2 below summarizes the Custom Revenue Cap Index by Component that Hydro One is proposing to use in this Application to determine Total Revenue Requirement for rate-making purposes for 2019 through 2022.

Table 2: Custom Cap Index (RCI) by Component (%)

Custom Revenue Cap Index by Component	2019	2020	2021	2022
Inflation Factor (I)	1.90	1.90	1.90	1.90
Productivity Factor (X)	-0.45	-0.45	-0.45	-0.45
Capital Factor (C)	1.96	1.83	2.78	1.39
Custom Revenue Cap Index Total	3.41	3.28	4.23	2.84

Table 3 below summarizes the Total Revenue Requirement that would result from the Board's approval of Hydro One's Custom IR, were the Application to be approved as filed.

Witness: Oded Hubert

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GLOSSARY:

AA	Asset Analytics – A support tool that focuses on asset risk prioritization to enable planners to make optimal asset decisions at any point in time (30+ year timeline)
AIP	Asset Investment Planning – A support tool that evaluates investment alternatives based on corporate risks and financial objectives to produce an optimized investment plan
BCS	Business Case Summary (used for Project approval)
BPC	Business Planning and Consolidation – A support tool that delivers an integrated financial model to support business planning, budgeting, and forecasting
BV	Business Values – These are the values that enable the achievement of the Company's strategic goals by forming the criteria against which investments are developed, risks are managed, and trade-offs are facilitated between investments.
IPP	Investment Plan Proposal – The output of the prioritization process that feeds into the Corporate Business Plan
OAR	Organizational Authority Register
PN	Potential Need notification (as documented in SAP against a specific asset)
SICA	Station Investment Capital Approval (used for "station centric" bundled program approval)
UPC	Unit Price Catalogue / Unit Price Cost

ASSET ANALYTICS (AA) OVERVIEW

Asset Analytics (AA) Overview

Asset Supporting Factors:
- 9 live data Interfaces with various corporate databases (including SAP)
- 10 rationalized data interfaces with decommissioned databases

6 Risk Factors:
- Demographics
- Condition
- Performance
- Criticality
- Economics
- Utilization

plus a ***Composite*** factor showing overall risk rating

Asset Analytics Algorithms

Overall Risk Score:
- 1 to 100 score assigned to each asset risk factor
- Higher the score, higher the risk

1 to 15 Very Good
>15 to 30 Good
>30 to 50 Fair
>50 to 70 Poor
>70 to 100 Very poor

Asset Portfolio Document (APD):
- Detailing asset strategies are under development

Prepared by Internal Audit
For audit report purposes only

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A-3-1 Att#3
March 31, 2017

AG Recommendation 5: Information Systems on Asset Condition incl. Asset Analytics

- Enhance its Asset Analytics system to include information on all key factors that affect asset investment decisions, including those related to technological/manufacturer obsolescence, known defects, environmental impact and health and safety.
- Review and adjust current weighting assigned to risk factors in Asset Analytics to more accurately reflect their impact of asset condition and risk of failure.
- Make changes to its Asset Analytics system and procedures so that updates to its data are complete, timely and accurate.
- Conduct a comprehensive review of the data quality in Asset Analytics to update any incomplete or erroneous information on its assets and to ensure the information can support its asset replacement decision making process.
- Investigate why known deficiencies in the reliability of the Asset Analytics system, such as those found two years earlier by internal audits, have not been corrected by management in a timely manner.

• Management demonstrated that its analytics tools continue to be maintained and improved: e.g. Google Earth view in Asset Analytics was replaced with Space Time Insight Interface, and the Transmission Lines Graphic Information System (TLGIS) work backlog was completed to make design changes visible. • Recent data remediation efforts were primarily focused on transmission data (due to the timing of the transmission rate filing) but did not adequately address distribution data integrity issues. The company's plan to develop a long term sustainable approach to management of data quality and completeness should upon completion, help mitigate the risk of continuing data integrity issues. • Three of the tasks have target completion dates at December 31, 2016 and remain as work in progress.	Partially Complete	Partially Effective	a) Completion of the design and implementation of the Data Governance project presently underway. b) Complete tasks #21 and #24 and work in progress tasks #16-18, as committed by management.

AG Recommendation 6: Quality of Asset Data

- Hydro One should ensure that its applications to the Ontario Energy Board for rate increases include accurate assessments of the condition of its assets.

• Management focused its efforts on remediating data completeness issues on transmission data at the time of the audit. Current data governance is not adequate to provide ongoing data completeness and data quality monitoring.	Substantially Complete	Effective	Completion of the design and implementation of the Data Governance project presently underway.

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AG Recommendation 11: Quality of Data for Distribution Assets ○ Ensure that management decisions on replacing distribution system assets are made using reliable and complete information, Hydro One should take the actions needed to ensure its Asset Analytics system provides timely, reliable, accurate and complete information on the condition of assets.			
• An interface was established between the Distribution GIS and Asset Analytics to make recent design changes more visible. A test coordinated by ISD and Inergi shows that this interface is functioning properly. • Although recent data remediation efforts achieved success in reducing the number of data points that were found to be missing or incomplete, the focus had been on transmission data (to support the more immediate needs of the transmission rate filing). This effort had not yet addressed the data quality of distribution data at the time of our follow–up.	Substantially Complete	Effective	a) Complete task #42 as committed by management. b) Completion of the design and implementation of the Data Governance project presently underway.
AG Recommendation 12: Replacement of Distribution Assets at Risk of Failure ○ Replace assets that have exceeded their planned useful service life. ○ Reassess its planned expected service life for assets and justify any variances in the years used by Hydro One compared to other similar local distribution companies.			
• Distribution Asset Management (DxAM) has performed benchmarking studies with peer utilities on various maintenance programs including, pole replacements, station refurbishment, and vegetation management. The external study report from First Quartile/Navigant Consulting has informed and supports Hydro One's approach. For example, focusing the on-cycle vegetation management program on high priority/impact feeders (with high customer density, LDAs, and critical loads).	Complete	Effective	None

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A-3-1 A#

Task Numbers referenced in Appendix A – Requirements to Complete

AG Recommendation	Task number	Management Commitments as of September 30, 2016
1	3	Set Multi-year reliability targets for 2016 to 2020 in 2016 Corporate Scorecard. Hydro One will determine if it is viable to continue participating in studies that include comparable utilities beyond the Canadian utility landscape.
	6	Revisit the maintenance plan strategies and costs to optimize equipment performance and costs (aligned to historical Tx-SAIDI equipment causes).
5	16	Re-visit and evaluate the augmentation of the Asset Analytics tool to include the additional risk factors (i.e. Environmental/Health & Safety, Obsolescence)
	17	Risk Algorithms Review: Conduct a review of the risk factors algorithms and adjust current weightings as necessary to better support the asset replacement decision-making process.
	18	Improve the data collection, population and monitoring process for SAP data utilized in the Asset Analytics tool.
	21	Implementation of strategies for the population of absent legacy data (~1 million data fields will be addressed through default populations, derivation, validation, etc.).
	24	Development of data quality assessments and data audits for all Transmission asset classes.
7	28	Planned Maintenance Bundling Enablement: Continue to ensure work bundling efficiency at the Planning level is enabled (i.e. aligning call dates of maintenance plans that impact delivery points) to allow integrated outage scheduling and integrated work execution and minimize outages on same.
10	39	Review vegetation-management program and improve prioritization model to support decision-making. Quarterly review of progress in 2016; Annual review in Q3/4 2016.
11	42	Following the remediation of the Tx data, Planning will enable a project to focus on the Dx data. However, due to resource constraints, both of these initiatives are not able to be implemented simultaneously within the business.
13	46	Assessment of past maintenance expenditures and activities, with a focus on critical factors and contributors to the distribution reliability measure.
	48	Undertake a third-party review of its distribution system plan that will provide unit cost validation for forestry, pole replacement and station refurbishment.
	49	Hydro One's Distribution System Plan is under development and we will be having an independent third party review of such in 2016.
17	68	As part of project closure process, compare our internal construction project costs to industry benchmarks of contracting out similar capital work.

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Appendix A

Table 1: AG Recommendation Task Numbers – Tasks completed as of September 30, 2016

AG Recommendation	Task #	Management Commitments
1	1	Conduct assessments on poor performing single circuit transmission lines consistent with the Customer Delivery Point Performance Standard.
	2	Continue to analyze outage data to identify reliability issues and identify investments to improve customer reliability in accordance with the OEB's Customer Delivery Point Performance Standard (CDPPS).
	5	Implement Planning-Stage work-bundling strategy to combine planned maintenance to reduce planned outages, reducing the risk of delivery point interruptions.
	7	Continue to report on System Reliability through the CEA
2	8	Identify Preventive Maintenance backlog
	9	Perform analysis to confirm "completed" orders are appropriately documented
	10	Document existing Preventive Maintenance strategy and process.
3	12	Provide clear explanation regarding our transformers and breakers replacement strategy, selection process and execution methodology as part of the 2017/18 Tx Rate Application.
	13	Provide information specific to key assets replaced in 2015, 2016 or planned to be replaced, and reasons for deferrals.
	14	Provide information specific to key assets planned to be replaced in 2017 and 2018 with justifications and possible deferrals as part of the 2017/18 Tx Rate Application.
4	15	Engage a third party expert to review the transformer fleet health assessment.
5	16	Re-evaluate the augmentation of the AA tool to include the additional risk factors (i.e. Environmental/H&S, Obsolescence)
	19	Define accountabilities for change control for all asset classes.
	20	Identify all Tx data included in Asset Analytics and implement project to populate these elements
	21	Implement strategy to populate absent legacy asset data
	22	Replace Asset Analytics Google earth view to provide a more accurate view of the Tx system
	23	Address backlog of Transmission Lines GIS updates.
6	25	Re-prioritize resources to address actions deferred from previous internal audits through a data remediation project

Witness: KIRALY Gregory

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AG Recommendation	Task #	Management Commitments
7	28	Continue Planning-stage work bundling to allow integrated outage scheduling and integrated work execution and minimize outages.
	29	Conduct benchmarking and best practice studies with other North American transmitters for reliability and cost improvements, consistent with OEB direction
8	31	Develop and implement a new comprehensive security program which will apply to all electronic devices, including the hardening of deployed devices.
9	33	Establish an Investment Plan for the 2017-2022 period which identifies projects to improve reliability.
	34	Monitor project completions as part of monthly reporting process and incorporate remote monitoring and control into investment scopes.
	35	Update asset portfolio documents for vegetation management to include reliability management of Large Distribution Account customer feeders.
	36	Establish Vegetation Management prioritization matrix to increased emphasis on reliability to provide execution teams more direction. Introduce more granular work accomplishment reporting as part of monthly reporting cycle.
	37	Develop strategies for cost-effective investments to improve reliability, including increased line and distribution station renewal; relocating assets to road allowances to improve access and facilitate fault-finding; enable control room visibility and controllability of devices, and prioritizing vegetation management programs to focus on reliability to large commercial/industrial customers.
10	38	Introduce an eight-year vegetation management cycle over the longer term.
	40	Prioritize vegetation management on feeders with more frequent tree-related outages.
	41	Conduct annual vegetation management program review to identify issues and action plans for improvement.
11	43	Enable the interface between the Distribution GIS system and Asset Analytics to make recent design changes visible.
12	44	Continue to maximize asset life expectancy and optimize work efficiency for pole assets based on operations, maintenance and conditions under which the asset is used.
	45	Continue to base asset replacement decisions based on condition, not age.
13	47	Participate in benchmarking studies, as directed by OEB, to support its approaches to investment, maintenance and sustainment activities to be included in the next distribution rate application.
15	51	Review Forecasting Model for predicting Transformer failures

Witness: KIRALY Gregory

AG Recommendation	Task #	Management Commitments
	53	Develop a plan to standardize Distribution Transformers and implement a rationalization strategy to reduce the number of types of transformers
	54	Review plans for further rationalize the number of types of Transmission transformers
	55	Conduct detailed review of Tx Spares models & compliment needs
	59	Quantify Savings from moving from (current) 14 Standards to fewer Standards
	60	Develop a strategy to reduce number of Tx spare transformers in inventory from 44 to 28 over next 10 years
	61	Develop a Strategy and Process to determine DS Spare Transformer scrapping and purchase requirements
16	65	Provide PQ information to Tx-connected customers, including estimates of frequency and duration of potentially disruptive voltage sag events tailored to the customer's specific connection point.
	66	Perform detailed analysis of PQ data to improve estimation of the frequency, duration and magnitude of potential events that could have an adverse effect on its equipment and processes.
	67	Provide PQ reports to identified customers
17	69	Review contingency and escalation allowances used in Capital project estimates and establish an internal guideline in line with industry benchmarks
	70	Implement a project closure process for larger projects to ensure work is completed as planned, project estimates are compared against actuals, all variances are explained and learnings are incorporated into future projects; Include originally approved budget and in-service dates
	71	Implement a process to provide a yearly summary of completed projects to compare project estimates to final project costs and determine "success rate" over the next 10 years

Witness: KIRALY Gregory

A-3-1
Att #4
Pages

F

4. Information Provided to OEB in Rate Applications [Rec 6] (Complete ✓)

Recommendations included ensuring that its applications to the Ontario Energy Board for rate increases include accurate assessments of the condition of its assets.

Activities Completed:

Context Clarification: Hydro One endeavors to ensure all data submitted to the OEB for rate setting purposes accurately reflects its forward test year plans. In making this statement, the Auditor General appeared to have focused on investments that appeared in successive applications. In practice, investments are sometimes delayed due to work execution delays or other factors including changes in priority due to changing circumstances since the last rate application.

>To address this concern Hydro One has provided evidence supporting the 2017-2018 capital spending plans. These plans are based on the best information available at the time of filing the application. Hydro One is also prepared to explain variations from its previous plans and/or OEB approved spending amounts, compared to actual work completed. In addition, data quality improvement activities have been taken explained under item 5 below.

5. Asset Analytics System – Data Remediation [Rec 5, 11] (Mostly Complete ☑)

Recommendations included enhancing the Asset Analytics system to include information on all key factors that affect asset investment decisions; review and adjust current weighting assigned to risk factors to more accurately reflect their impact of asset condition and risk of failure; and make changes to procedures so that updates to its data are complete, timely, reliable and accurate to ensure the information can support its asset replacement decision making process.

Activities Completed:

Context Clarification: The purpose of Asset Analytics is to provide asset planners with convenient access to asset data and assess emerging risk factors in an efficient manner. Decisions to replace assets are made by the asset planners in part based on Asset Analytics output and also based on many factors fully described in our rate filing evidence. Asset Analytics is one tool to aid in decision making, but it is not the only factor considered.

>A data remediation project was established in 2015 to address data quality, population levels, processes and functionality issues related to the Asset Analytics tool. The focus was on data used in the AA algorithms.

>Significant data and functionality improvements for Asset Analytics were completed over 2015-2016, with key activities as follows:

- Metrics: Dashboards for population levels, missing data reports and effectiveness of new assets completeness have been established for all of the Transmission and Distribution asset hierarchies.
- Data: Transmission Stations data has been increased from 35% to 85%, Transmission Lines from 50% to 70%, with new assets consistently close to 100% population
- Data: Distribution Stations data has been increased from 35% to 60%, Distribution Lines data is a current focus, starting at 69%, with a plan to get to 85% by year end. This work is in progress.

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12. Management Oversight Processes over Capital Project Costs [Rec 17] (Mostly Complete ☑)

Recommendations: Included conducting benchmarking to assess capital construction project costs; adherence to industry-normal contingency and escalation allowances; to improve management reporting and oversight of project costs showing actual project costs and completion dates compared to estimates.

Activities Completed:

>Total Cost Benchmarking study (Navigant) was completed noting a number of benchmarks for project management performance. The internal work breakdown structure has been refined to enable a more efficient, consistent and accurate cost collection process for capturing project actual costs and comparisons.

>Contingency and escalation allowances have been reviewed and redefined. Escalation rates are now in line and consistent with our corporate business plan and we have implemented a quantitative project risk management methodology. In addition, a formalized project closure report process (including all project stakeholders) has been implemented to analyze the project plan and the effectiveness of its execution.

>*In progress*. Hydro One is currently working to develop relationships with peer Canadian utilities to develop a consistent approach to benchmarking capital project work with an early focus on transmission lines projects and with a subsequent focus to be on substation projects.

Summary of Outstanding Remediation Activities [5 activities in total]

1. Transmission & Distribution Systems Reliability Performance [Rec 1, 9] [two open activities]

- Multi-year transmission and distribution reliability targets are in development and will be set in accordance with the desired outcomes, corporate goals and strategies by the end of May 2017.

5. Asset Analytics System – Data Remediation [Rec 5, 11] [one open activity]

- Distribution data remediation continues, focusing on key activities such as asset counts across multiple systems (i.e. poles, pole-top transformers in GIS, SAP differ at present), development of Lines metrics dashboard and process fixes, targeted completion for main activities is end of Q3 2017.

8. Use of Smart Meters Capabilities to Improve Response to Power Outages [Rec 14] [one open activity]

- Requirements and scope have been solidified and vendors chosen to do the work. Estimated completion and implementation is the end of 2017.

12. Management Oversight Processes over Capital Project Costs [Rec 17] [one open activity]

- Hydro One is currently working to develop relationships with peer Canadian utilities to develop a consistent approach to benchmarking capital project work with an early focus on transmission lines projects and with a subsequent focus to be on substation projects. Estimated completion is end of 2017

Follow-Up Request – Internal Audit – Validation of Activities Completion

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- Internal Audit validated 39 activities as completed in Sept 2016. As a follow-up, at the end of March 2017, a request was made to Internal Audit to validate evidence on the remaining items completed over the timeframe of Oct 2016 to March 2017. This will take place before the end of 2017.

INTERNAL AUDIT REPORT

Auditor General Report Follow-up 2017

To:

Greg Kiraly
Chief Operating Officer

Distribution:

Mayo Schmidt	President & Chief Executive Officer
Chris Lopez	Senior Vice President, Finance
Darlene Bradley	Vice President, Planning
Andrew Spencer	Vice President, Transmission and Stations
Bruno Jesus	Director, Strategy and Integrated Planning
Chong Kiat Ng	Director, Transmission Asset Management
Lyla Garzouzi	Director, Distribution Asset Management
Kathleen McCorriston	Director, Project Management
Additional Recipients	Email Distribution List

Final Report Issued: November 28, 2017
Draft Report Issued: October 17, 2017
Report Number: 2017-19

Lead Auditor: William Chan
Audit Manager: Jeff Schaller

16

AG Recommendation 5: Information Systems on Asset Condition incl. Asset Analytics

- Enhance its Asset Analytics system to include information on all key factors that affect asset investment decisions, including those related to technological/manufacturer obsolescence, known defects, environmental impact and health and safety.
- Review and adjust current weighting assigned to risk factors in Asset Analytics to more accurately reflect their impact of asset condition and risk of failure.
- Make changes to its Asset Analytics system and procedures so that updates to its data are complete, timely and accurate.
- Conduct a comprehensive review of the data quality in Asset Analytics to update any incomplete or erroneous information on its assets and to ensure the information can support its asset replacement decision making process.
- Investigate why known deficiencies in the reliability of the Asset Analytics system, such as those found two years earlier by internal audits, have not been corrected by management in a timely manner.

Task #	Task Description (Original Management Commitments)	Assessment of Completion	Assessment of Control Design Effectiveness
16	Re-visit and evaluate the augmentation of the Asset Analytics tool to include the additional risk factors (i.e. Environmental/Health & Safety, Obsolescence)	Partially Complete	N/A
17	Risk Algorithms Review: Conduct a review of the risk factors algorithms and adjust current weightings as necessary to better support the asset replacement decision-making process.	Complete	Effective
18	Improve the data collection, population and monitoring process for SAP data utilized in the Asset Analytics tool.	Partially Complete	N/A
21	Implementation of strategies for the population of absent legacy data (~1 million data fields will be addressed through default populations, derivation, validation, etc.).	Partially Complete	N/A
24	Development of data quality assessments and data audits for all Transmission asset classes.	Partially Complete	N/A

Observations:

- Management has a plan in place to address additional risk factors requirements for Asset Analytics over a 3 year period between 2018-2020. (Task 16)
- Risk factors algorithms have been reviewed and adjusted to better support the decision-making process. (Task 17)
- The data remediation effort has not adequately addressed distribution data completeness. (Task 18, 21)
- There is a lack of sustainable approach over the long term to manage data completeness and data quality. (Task 21)
- The implementation timelines, project scope, recommended targets on data quality and timeliness, roles, and accountabilities have not been adequately stakeholdered during the time of the audit (early September 2017) in order for us to evaluate the effectiveness of the control design. (Tasks 21, 24)

AG Recommendation 11: Quality of Data for Distribution Assets

- Ensure that management decisions on replacing distribution system assets are made using reliable and complete information, Hydro One should take the actions needed to ensure its Asset Analytics system provides timely, reliable, accurate and complete information on the condition of assets.

Task #	Task Description (Original Management Commitments)	Assessment of Completion	Assessment of Control Design Effectiveness
42	Following the remediation of the Transmission data, Planning will enable a project to focus on the Distribution data. However, due to resource constraints, both of these initiatives are not able to be implemented simultaneously within the business.	Partially Complete	N/A

Observations:

- Based on the evidence gathered on the distribution data (DS, DL) remediation efforts, this project is currently running on an ad-hoc basis with a lack of an implementation schedule nor the establishment of the data completeness and accuracy targets.

School Energy Coalition Interrogatory # 29

Issue:
Issue 18: Are the metrics in the proposed additional scorecard measures appropriate and do they adequately reflect appropriate outcomes?

Reference:
B1-01-01 Section 1.4 Page: 29-43

Interrogatory:
The performance measures contained in Table 16 include a number of measures not included on the proposed OEB Scorecard (p.3). Please provide a single table that shows all performance measures with actual performance from 2011-2016, and targets for 2017-2022.

Response:
All measures in Exhibit B1, Tab 1, Schedule 1, DSP Section 1.4, pp. 29-43, Table 16 are included in either the Electricity Distributor Scorecard or the proposed Dx OEB Scorecard.

Please refer to the updated Electricity Distributor Scorecard and the Dx OEB Scorecard below.

Please note the following regarding the information provided in the scorecards below:

- The OEB revised the reporting methodology for SAIDI and SAIFI to exclude Loss of Supply and Force Majeure. SAIDI and SAIFI results prior to 2012 were not restated.

- The Net Cumulative Energy Savings measure is based on the 2015-2020 Conservation First Framework. The Electricity Distributor Scorecard was revised to show targets for the same period.

- The Net Cumulative Energy Savings results shown for 2017 will be confirmed by the IESO in Q3-2018.

- For the Electricity Distributor Scorecard, consistent with the evidence filed, Hydro One cannot provide targets for the measures in the Financial Ratios Performance Category or measures which are reported by third-parties[1].

- For the Dx OEB Scorecard, consistent with the evidence filed, and due to the denominator variable for OM&A Dollars per Customer and OM&A Dollars per km of Line, Hydro One cannot provide targets for 2018 to 2022. Please refer to Exhibit Q, Tab 1, Schedule 1, Attachment 1, p 16 for the OM&A budget for 2018 to 2022.

- 2017 results for measures in the Financial Ratios Performance Category of the Electricity Distributor Scorecard or in the Cost Control category of the Dx OEB Scorecards cannot be provided at this time.

- Targets for System Reliability Measures in the Dx OEB Scorecard beyond 2018 have not currently been developed (e.g. SAIDI & SAIFI for Urban, Rural).

[1] All measures contained in the Safety and Cost Control Performance Categories

Electricity Distributor Scorecard

Performance Outcomes	Performance Categories	Measures		ACTUALS 2011	2012	2013	2014	2015	2016	2017	TARGETS 2017	2018	2019	2020	2021	[illegible]
Customer Focus [illegible]	Service Quality	New Residential/Small Business Services Connected on Time		92.00%	95.70%	97.40%	97.40%	97.50%	98.60%	98.06%	98.0%	98.0%	98.0%	98.0%	98.0%	98.0%
		Scheduled Appointments Met On Time		93.90%	98.60%	98.40%	99.30%	98.50%	99.50%	98.94%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
	Customer Satisfaction	Telephone Calls Answered On Time		81.40%	83.40%	63.90%	69.60%	76.40%	74.20%	82.00%	80.0%	80.0%	80.0%	80.0%	80.0%	80.0%
		First Contact Resolution*				78.30%	79.00%	82.00%	82.00%	85.00%	85.0%	86.0%	87.0%	87.0%	88.0%	88.0%
		Billing Accuracy					94.63%	98.59%	99.04%	99.30%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
		Customer Satisfaction Survey Results*				87.00%	85.00%	85.00%	84.00%	84.90%	86.0%	87.0%	87.5%	88.0%	88.5%	89.0%
Operational Effectiveness [illegible]	Safety	Level of Public awareness						81.00%	N/A	TBD	N/A	N/A	N/A	N/A	N/A N/A	
		Level of Compliance with Ontario Regulation 22/04 [1]		NI	NI	NI	NI	C	NI	TBD	C	C	C	C	C	C
		Serious Electrical Incident Index	Number of General Public Incidents	8	6	7	4	5	11	TBD	N/A	N/A	N/A	N/A	N/A	4
			Rate per 10, 100, 1000km of line	0.066	0.051	0.059	0.033	0.042	0.091	TBD	N/A	N/A	N/A	N/A	N/A	N/A
	System Reliability**	Average Number of Hours that Power to a Customer is Interrupted [2]			6.98	6.88	7.49	7.65	7.83	7.90	7.5	7.0	6.7	6.4	6.1	5.8
		Average Number of Times that Power to a Customer is Interrupted [2]			2.61	2.49	2.70	2.63	2.47	2.30	2.6	2.4	2.3	2.2	2.1	2.0
	Asset Management	Distribution System Plan Implementation Progress*				Under Review	97%	116%	105%	TBD	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Cost Control	Efficiency Assessment			5	5	5	5	4	TBD	5	5	5	5	5	5
		Total Cost per Customer [3]		$1,072	$1,041	$1,046	$ 1,069	$ 983	$ 987	TBD	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG
		Total Cost per km of Line [3]		$11,064	$10,741	$10,682	$ 10,916	$ 10,198	$ 10,551	TBD	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG	N/A, PEG
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 Cumulative Energy Savings [4]						17.27%	42.50%	60.50%***	60.5%	75.9%	88.9%	101.0%	N/A, See Footnote	N/A, See Footnote
	Connection of Renewable Generation	Renewable Generation Connection Impact Assessments Completed On Time		95.79%	99.39%	100.00%	100.00%	100.00%	100.00%	99.51%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
		New Micro-embedded Generation Facilities Connected On Time				99.71%	100.00%	99.78%	99.22%	99.77%	99.0%	99.0%	99.0%	99.0%	99.0%	99.0%
Financial Performance [illegible]	Financial Ratios	Liquidity: Current Ratio (Current Assets/Current Liabilities)		0.99	0.99	1.00	0.99	0.97	0.80	TBD	N/A	N/A	N/A	N/A	N/A	N/A
		Leverage: Total Debt (includes short-term and long-term debt) to Equity Ratio		1.34	1.30	1.35	1.31	1.19	1.46	TBD	N/A	N/A	N/A	N/A	N/A	N/A
		Profitability: Regulatory Return on Equity	Deemed (included in rates)	9.66%	9.66%	9.66%	9.66%	9.30%	9.19%	TBD	N/A	N/A	N/A	N/A	N/A	N/A
			Achieved	8.80%	8.72%	8.00%	6.26%	8.77%	8.41%	TBD	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. Compliance with Ontario Regulation 22/04 assessed: Compliant (C); Needs Improvement (NI); or Non-Compliant (NC).
2. The trend's arrow direction is based on the comparison of the current 5-year rolling average to the fixed 5 year (2010 to 2014) average distributor-specific target on the right. An upward arrow indicates decreasing reliability while downward indicates improving reliability.
3. A benchmarking analysis determines the total cost figures from the distributors' reported information. 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.
4. The CDM measure is based on the new 2015-2020 Conservation First Framework. This measure is under review and subject to change in the future. Since the Framework ends in 2020, the target for this application aligns with the end year of 2020.

*Self-defined metric; no common industry standard.
**System Reliability Measures were restated under the direction of the OEB to exclude both Loss of Supply and Force Majeure - results prior to 2012 were not restated.
***To be verified by the IESO.

Witness: KIRALY Gregory

Dx OEB Scorecard

RRFE Outcomes		Measure	Historical Results 2011	2012	2013	2014	2015	2016	Actual 2017	Target 2017	2018	2019	2020	2021	2022
Customer Focus	Customer Satisfaction	Customer Satisfaction - Perception Survey %	77%	78%	80%	67%	70%	66%	71%	72%	74%	75%	75%	76%	76%
		Handling of Unplanned Outages Satisfaction %	81%	79%	78%	75%	76%	75%	76%	76%	77%	78%	78%	79%	79%
		Call Centre Customer Satisfaction %	85%	84%	82%	81%	85%	86%	90%	86%	87%	88%	88%	89%	89%
		My Account Customer Satisfaction %	81%	84%	64%	75%	78%	79%	78%	81%	83%	84%	84%	85%	85%
Operational Effectiveness	Cost Control	Pole Replacement - Gross Cost Per Unit in $	8,541	8,441	7,824	8,928	8,392	8,350	TBD	8,640	8,733	8,908	9,080	9,256	9,437
		Vegetation Management - Gross Cyclical Cost per km $**			New Program				TBD	New Program	3,600	3,643	3,687	2,400	2,428
		Station Refurbishments - Net Cost per MVA in $*	386,000	-	318,000	348,000	500,000	557,000	TBD	461,000	454,000	447,000	440,000	434,000	427,000
		OM&A dollars per customer	456	451	498	551	453	455	TBD	449	455	TBD	TBD	TBD	TBD
		OM&A dollars per km of line**	4,723	4,676	5,109	5,654	4,719	4,773	TBD	4,712	4,773	TBD	TBD	TBD	TBD
	System Reliability	Number of Line Equipment Caused Interruptions	7,681	7,316	7,266	8,311	8,164	7,674	8,786	8,200	8,200	TBD	TBD	TBD	TBD
		Number of Vegetation Caused Interruptions	6,113	6,953	5,791	6,540	6,944	7,439	7,800	6,900	6,500	TBD	TBD	TBD	TBD
		Number of Substation Caused Interruptions	159	144	129	158	141	103	123	145	145	TBD	TBD	TBD	TBD
		SAIDI - Rural - duration in hours	8.2	8.2	8.1	8.6	9.1	9.1	9.4	9.1	9.0	TBD	TBD	TBD	TBD
		SAIFI - Rural - frequency of outages	3.3	3.3	3.0	3.4	3.4	3.1	3.0	3.4	3.4	TBD	TBD	TBD	TBD
		SAIDI - Urban - duration in hours	2.7	3.2	2.2	2.8	2.8	2.4	2.4	2.8	2.8	TBD	TBD	TBD	TBD
		SAIFI - Urban - frequency of outages	1.6	1.7	1.6	2.3	1.4	1.6	1.4	1.7	1.7	TBD	TBD	TBD	TBD
		Large Customer Interruption Frequency (LDA's) - frequency of outages	New Measure		118	147	228	136	162	143	143	TBD	TBD	TBD	TBD

*There were no station refurbishment units matching the criteria completed in 2012

**Number of line kms are based on the annual OEB Yearbook of Electricity Distributors' report, with 2017 and 2018 targets based on 2015 line km actuals.

Witness: KIRALY Gregory

Observations	Recommendations	Action Plan
1.4 Asset Analytics (AA)	**Risk[2]** H	**Executive:** Darlene Bradley, VP Planning **Accountability:** Bruno Jesus Director, Strategy & Integrated Planning
Asset Analytics (AA) is a tool available to planners to assess asset needs based on asset condition data collected during routine maintenance, performance history, utilization, age and criticality. Management informed us that Asset Risk Indexes (ARI) from the AA tool are one of many inputs that feed into the development of candidate investments, and that these ARIs are not intended to be used as a replacement for the sound engineering judgment and decisions of the qualified Planning engineers, and is only one step of the broader process which is used in conjunction with physical inspections. In 2016, management held workshops with key stakeholders involved in the Investment Planning Process to review and discuss changes to ARI algorithms, input data and new risk factors. To date, management has not implemented any of the requirements identified in the AA workshops, however plans are underway to address 78 requirements related to two new risk factors and 159 requirements related to enhancements to risk factors by end of 2020. We remain concerned about the data quality from supporting systems (such as SAP) that are used as inputs to Asset Analytics. ***Risk:*** *The absence of well-understood and quality asset information increases the risk of inadequate asset need assessment which can result in diminished confidence in the process involving the AA tool and the potential for less than optimal investment decisions.*	Continue to identify and correct issues with Asset Analytics input data and risk factor algorithms that will affect the degree to which the output results can be used to influence investment decisions.	Plans related to data required for Asset Analytics will be developed and key steps and milestones to address the recommendation will be tracked in the Divisional Scorecard. **Completion:** December 31, 2017

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Observations	Recommendations	Action Plan
1.5 Asset Management Tool Enhancements	**Risk**[2] M	**Executive:** Darlene Bradley, VP Planning **Accountability:** Bruno Jesus Director, Strategy & Integrated Planning
Asset Analytics (AA) and Asset Investment Planning (AIP) are two key support tools used by planners for which a number of deficiencies were identified during the last audit. We had noted that the load flows, voltages, asset connectivity and statuses related power system historical data required for area supply studies in support of System development projects were unavailable in AA. We had also noted that there were manual workarounds in place to update AIP input data from SAP and other systems (such as Unit Price Catalogue, Project Forecasts, etc.). Since then, Management has developed an Asset Management Tool Integration Roadmap in 2015, identifying 24 enhancement requests and 16 integration requests with other systems. The roadmap shows that the requirement to integrate power system data from NMS & PSDB[7] systems is ranked 22nd out of 24 in priority. A firm implementation schedule for the enhancement and integration requests identified in the roadmap is unavailable. Management informed us that in the absence of further progress, same manual workarounds as those observed in 2015 remain in place. ***Risk:*** *Unavailability of required data in AA & AIP tools may result in incorrect/inconsistent decision making. Manual workarounds as a result of lack of data integration could result in delays and/or poor quality investment plans.*	Review and establish appropriate funding and actual implementation plans for the enhancements identified in the Asset Management Tool Integration Roadmap.	Management will review the tool enhancement roadmap, to determine necessary enhancements taking into account cost/benefit with decisions to keep, defer or discard items. **Completion:** June 30, 2018

[7] Network Management System (NMS) and Power System Database (PSDB) are two systems that contain power system historical data.

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Observations	Recommendations	Action Plan
1.6 Risk Assessment Matrix	**Risk**[2] M[8]	**Executive:** Darlene Bradley, VP Planning **Accountability:** Bruno Jesus Director, Strategy & Integrated Planning
During our audit on this subject in 2015, we found that the risk assessment matrix being used to assess baseline and alternative risks for a given investment was being used inconsistently. Subsequent to that audit, management has conducted annual Risk Assessment training to provide specific guidance to planners with examples on how to perform risk assessment using the available risk matrix. A risk calibration session held in 2016 indicated a moderate success in aligning risks across all investments. As a result, management sought the services of an external consultant (McKinsey) in 2017 to review and recommend a simplified approach to consistent risk assessment for the 2017 investment planning cycle. A new simplified risk assessment is now planned for transmission investments in 2017 with plans to use a similar approach for distribution investments starting in 2018 because the Distribution investment plans are presently with the regulator and "frozen" for the current planning cycle. We note that an informal survey of 17 planners indicated that challenges remain related to risk assessments for distribution investments. ***Risk:*** *Inadequate assessment of baseline and alternative-specific risk could result in incorrect risk values being assigned.*	Assess the effectiveness of the recently implemented, simplified risk assessment approach for transmission assets and develop a plan to implement a similar approach suitable for distribution assets.	Management will assess the effectiveness of the current transmission process and develop a plan (relating to risk assessment approach) to improve the distribution process accordingly. **Completion:** June 30, 2018.

[8] A new Risk Assessment Matrix for Transmission and Common assets has been recently introduced so the residual risk for these assets may be lower but a similar matrix for Distribution assets is planned to be introduced in 2018 so the residual risk for these assets remains at Medium

ATTACHMENT 5: CORPORATE ORGANIZATION CHART

This Attachment describes the corporate organization as it relates to Hydro One Distribution. Hydro One Distribution is owned and operated by Hydro One Networks Inc., a wholly-owned subsidiary of Hydro One Inc., which in turn is wholly-owned by Hydro One Limited.

1. CORPORATE ORGANIZATION

Figure 1 shows the organizational structure of Hydro One Limited as of February 28, 2017. This chart is simplified and does not include all legal entities within Hydro One Limited's organizational structure.

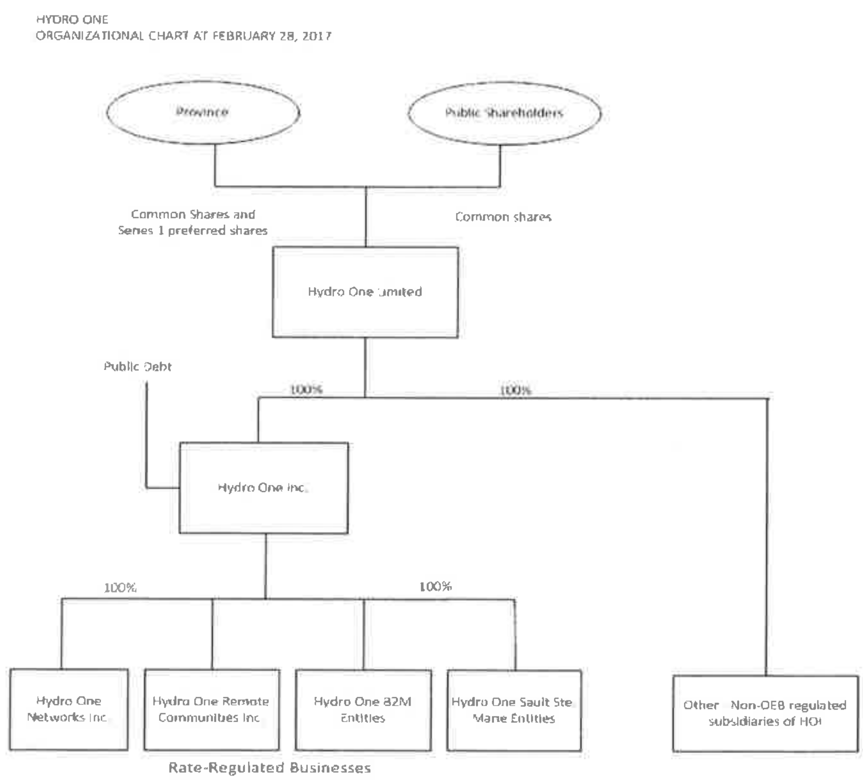

Figure 1: Hydro One Limited Corporate Structure

Witness: Michael Vels

CORPORATE GOVERNANCE OVERVIEW

★ CHAIR ● MEMBER

BOARD OF DIRECTORS AND COMMITTEES	AUDIT	NOMINATING, CORPORATE GOVERNANCE, PUBLIC POLICY AND REGULATORY	HUMAN RESOURCES	HEALTH, SAFETY, ENVIRONMENT AND FIRST NATIONS AND MÉTIS
David Denison – Chair				
Mayo Schmidt – President and CEO				
Ian Bourne		●	★	
Charles Brindamour	●		●	
Marc Caira		●	●	
Christie Clark		●	●	
George Cooke	●			●
Marianne Harris			●	★
James Hinds	●			●
Kathryn Jackson		●		●
Roberta Jamieson	●			●
Frances Lankin	●	●		
Philip Orsino	★	●		
Jane Peverett		★	●	
Gale Rubenstein			●	●

Hydro One and its independent Board of Directors recognize the importance of corporate governance to the effective management of the company. Independence, integrity and accountability are the foundation of the company's approach to corporate governance. It is in the long-term best interests of shareholders as well as customers and promotes and strengthens relationships with employees, the communities in which the company operates and other stakeholders of the company. The Board of Directors is firmly supported in these commitments by a governance agreement between Hydro One and the Province of Ontario, which was executed in advance of the November 2015 initial public offering of the company and assures that the Province's role is limited to that of a shareholder and not a manager of the business.

Hydro One's Board of Directors is composed of a diverse and accomplished group of independent, proven business leaders with deep corporate governance experience. The Board's primary role is overseeing corporate performance and the quality, depth and continuity of management required to meet the company's strategic objectives. Hydro One is committed to best practices of corporate governance, and regularly reviews the company's governance practices in response to changing governance expectations and regulations. The Company's practices are fully aligned with the rules and regulations issued by Canadian Securities Administrators and the Toronto Stock Exchange, including national corporate governance guidelines and related disclosure requirements.

HYDRO ONE'S GOOD GOVERNANCE PRACTICES

FULLY INDEPENDENT BOARD (EXCLUDING CEO)	CODE OF BUSINESS CONDUCT AND WHISTLEBLOWER HOTLINE	ANNUAL REVIEWS OF BOARD AND COMMITTEE PERFORMANCE
BOARD EDUCATION SESSIONS	COMMITTEE AUTHORITY TO RETAIN INDEPENDENT ADVISORS	BOARD AND COMMITTEE IN-CAMERA DISCUSSIONS
TERM LIMITS FOR DIRECTORS	DIRECTOR SHARE OWNERSHIP GUIDELINES	COMMITMENT TO DIRECTOR DIVERSITY
SEPARATE BOARD CHAIR AND CEO	MAJORITY VOTING FOR DIRECTORS	GOVERNANCE AGREEMENT WITH PROVINCE

For a complete description of Hydro One's corporate governance structure and practices and individual director biographical information, go to
▶ HydroOne.com/Investors

Based on the results of this formal initiative, and consistent with the customer feedback that Hydro One receives in its day-to-day operations, Hydro One believes that keeping costs as low as possible is the top priority of its customers. Specifically, the results indicated that:[1]

- controlling cost is the top priority for customers;
- customers want to see Hydro One demonstrate greater fiscal management and operational efficiency before considering rate increases;
- maintaining reliable electricity service is consistently second, after cost control, in terms of priority;
- large customers are more concerned than other customers are with reliability and capacity; and
- customers are generally unwilling to accept a rate increase, except in the context of potentially degrading reliability.

4.3 ADDRESSING CUSTOMER FEEDBACK AND STRIKING THE RIGHT BALANCE: "PLAN B MODIFIED"

Following the formal customer engagement initiative, Hydro One developed three alternative candidate investment plans for consideration by its senior leadership team and were reviewed by the Board of Directors. In developing these alternative investment plans, Hydro One assessed the reliability impacts of varying investment levels for rights-of-way (vegetation management), pole replacement and stations. Based on Hydro One's data, these three investment areas are the most significant, predictable drivers of reliability. The alternative investment plans and their estimated projected rate impacts are discussed below:

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[1] Attachment 1 of DSP, Ipsos, *Distribution Customer Engagement Report: Development of Distribution Investment Plan August 2016*, pp. 146-147 (Section 1.3).

- Plan A, recommended by the Company's asset managers, would improve reliability and the overall condition of the system, and would result in a 7.1% rate increase in 2018 over 2017 and an average annual rate increase of 3.8% over the Term.
- Plan B, prepared to reflect an option that offered a smaller reliability improvement and marginal improvements in the overall asset condition of the system, would have resulted in a 6.2% rate increase in 2018 over 2017 and an average annual rate increase of 3.5% over the Term.
- Plan C would achieve the lowest possible 2018 rate increase while ensuring continued compliance with Hydro One's regulatory obligations, but would likely result in significantly reduced reliability and further deterioration in the overall condition of the system. Plan C would have resulted in a 5.0% rate increase in 2018 over 2017, and an average annual rate increase of 2.8% over the Term, and was not supported by the Company's asset managers because of the risk to the system.

More detail on Plans A, B, and C is provided in Section 2.4 of the DSP and in Tables 4 and 5 of this Exhibit.

The 2018 rate increases associated with all three of these investment plans reflects some factors that were not entirely within the company's immediate control in developing those plans. Approximately half of the rate increase is caused by changes in the load forecast (due to external factors such as conservation and demand management, and economic conditions) and the settlement of existing regulatory accounts. The large non-controllable component of the rate increase required Hydro One to consider aggressive deferrals of certain investments and significant efficiency initiatives in order to prepare investment plans that are consistent with the outcome of the customer engagement process, which highlighted the importance to customers of keeping cost increases to a minimum.

Hydro One's management, in discussion with the Board of Directors, determined that Plan B would still result in bill impacts that were too high for customers, particularly in 2018 and with the effects of the reduced load forecast. Senior management therefore challenged planners to continue to investigate a plan that would further mitigate cost increases but still reflect responsible stewardship of the assets and no degradation in reliability over the full Term. In particular, managers were challenged to consider how to mitigate the significant rate increase in 2018.

As a result, an adjusted investment portfolio with a forecasted 2018 rate impact of 5.4%, "Plan B – Modified", was developed that would maintain overall forecasted system reliability at current levels, while continuing to offer discrete power quality and reliability improvements for certain segments of the network. Tables 4 and 5 summarize the assumptions that defined Plans A, B, C and B - Modified.

Table 4: SAIDI Projection for Investment Plan Options

SAIDI[1]:	**Avg. 2013-15: 7.3 hours/year**	**Average Number of Hours that a Customer is Interrupted**					
	Assumptions			**Forecasted Impact on SAIDI [2]**			
	Failure Rate/Impact	**Contribution to SAIDI**	**SAIDI Contribution (based on 2013-15)**	**Plan A**	**Plan B**	**Plan C**	**Plan B-M**
Poles	• 345 outages/year • 180 customers/outage • 10 hours/outage	3%	0.2	20%	15%	(15)%	7%
Stations	• 16 failures (outages) /year • 1200 customers/outage • 24 hours/outage	4%	0.2	14%	5%	(4)%	0%
Other Line Components	• 2070 outages/year • 180 customers/outage • 4 hours/outage	23%	1.5	10%	0%	(10)%	(5%)
Vegetation	• 15,530 outages/year	27%	1.8	8%	8%	4%	8%
Estimated Impact to SAIDI				**6%**	**3%**	**(2)%**	**0%**
Forecasted SAIDI (hours)				**6.9**	**7.1**	**7.4**	**7.3**

Exhibit Reference: B1-1-1

1- Excludes force majeure and loss of supply events

2 – These columns reflect the forecasted impact on SAIDI by the end of 2022. Estimated performance improvement is expressed as a positive value; performance deterioration is expressed as a negative value.

Table 5: SAIFI Projection for Investment Plan Options

SAIFI [1]:	Avg. 2013-15: 2.6 outages/year	Average Number of Times a Customer is Interrupted					
	Assumptions			Forecasted Impact on SAIFI [2]			
	Failure Rate/Impact	Contribution to SAIFI	SAIFI Contribution (based on 2013-15)	Plan A	Plan B	Plan C	Plan B-M
Poles	• 345 outages/year • 180 customers/outage • 10 hours/outage	2%	0.1	20%	15%	(15)%	7%
Stations	• 16 failures (outages) /year • 1200 customers/outage • 24 hours/outage	3%	0.1	14%	5%	(4)%	0%
Other Line Components	• 2070 outages/year • 180 customers/outage • 4 hours/outage	18%	0.5	10%	0%	(10)%	(5%)
Vegetation	• 15,530 outages/year	16%	0.4	8%	8%	4%	8%
Estimated Impact to SAIFI				**4%**	**2%**	**(2)%**	**0%**
Forecasted SAIFI (instances)				**2.5**	**2.6**	**2.6**	**2.6**

Exhibit Reference: B1-1-1
1-Excludes force majeure and loss of supply events
2 – These columns reflect the forecasted impact on SAIFI by the end of 2022. Estimated performance improvement is expressed as a positive value; performance deterioration is expressed as a negative value.

Plan B - Modified included the following adjustments compared to original Plan B:

- A deferral of some 2018 capital spending on wood pole replacements, station refurbishments, component replacements, system capability reinforcement, information technology and facilities and real estate to minimize rate impacts and offset the effects of a reduced load forecast, accepting short-term, small-scale reliability impacts where appropriate;
- The acceleration of productivity initiatives to reduce unit and operational costs and associated rate impacts, which are described in Section 1.5 of the DSP and summarized in Table 6 of this Exhibit;
- To sustain reliability, continued investment in certain System Renewal projects and programs based on asset condition and poor performance; and
- The establishment of OM&A and capital programs to investigate power quality issues, install power quality meters and surge arresters, and improve grounding where needed.

These initiatives reduced the total Term projected capital expenditures by $51 million or approximately 7.5% when compared to original Plan B.

Witness: Oded Hubert

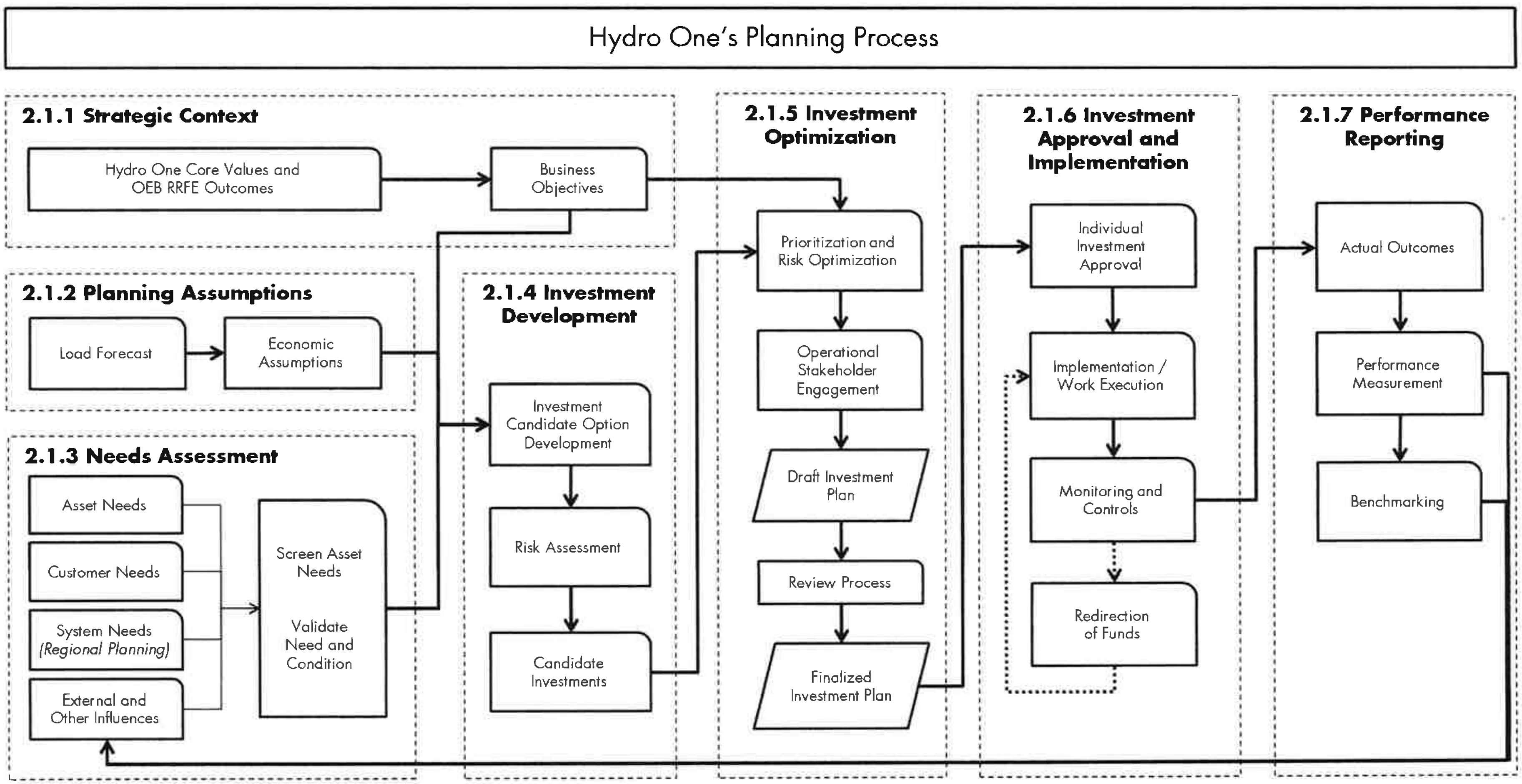
Plan B - Modified reflects an optimized investment portfolio that is designed to maintain current reliability within the proposed envelope for the period 2018 to 2022 by:

- implementing a vegetation management plan that is expected to result in improved reliability, at a spending level consistent with past OEB-approved levels, by using lower cost temporary workers to complete low-skilled work and by better aligning clearing frequency with reliability performance;
- outsourcing cable location work at lower cost;
- replacing poles at a rate that will maintain or slightly reduce by 2022 the population of poles that are in poor condition;
- refurbishing stations at a rate where station condition and reliability will remain stable over the forecast period;
- implementing a worst performing feeder initiative, which will deploy enhanced communication and automation capability to targeted lines to improve reliability by reducing outage duration;
- improved targeting of lines sustainment investments based on performance and focused on the root causes of poor performance;
- targeting OM&A and capital investments to address industrial customer power quality and reliability outliers; and
- ensuring continued compliance with regulatory, environmental and reliability standards.

The investments are described in more detail in Sections 3.1 to 3.8 of the DSP and in Exhibit C1, Tab 1, Schedules 1 to 10.

Hydro One believes that Plan B-Modified is the investment plan that most effectively aligns customer needs and preferences, responsible asset management, and bill impacts. Plan B-Modified maintains system health and reliability at current levels without further degradation, albeit without material improvement to the overall system.

Hydro One's Investment Planning Process



Distribution System Plan

Hydro One's Distribution System Plan (DSP) reflects the outcome of Hydro One's iterative business planning process to appropriately prioritize and pace its investment plan over 2017 to 2022 planning period, to align (i) identified customer needs and preferences; (ii) responsible stewardship of Hydro One's distribution system; and (iii) customer rates. This iterative process is described below.

As part of the process to determine an investment plan for the 2018 to 2022 portion of the business planning period, three investment scenarios were developed and shared for review with the Executive Leadership Team and the Board of Directors for the purpose of understanding the rate impact of each plan. A particular emphasis was placed on the first year of that period, 2018.

Plan A:

- 2018 Capital spend of $784 million. Average capital spend of $798 million for 2019-2022; designed to meet business objectives; Customer Service IT investments implemented;
- 2018 Rate Increase of 7.1% and average annual rate increase 3.8% over 2018 to 2022; and
- Reliability: System Average Interruption Duration Index (SAIDI) improves by approximately 6% and System Average Interruption Frequency Index (SAIFI) by 4%, by 2022.

Plan B:

- 2018 Capital spend of $685 million. Average capital spend of $747 million for 2019-2022; business objectives largely achievable, but effect on reliability and related customer impacts may partly impair some objectives;
- 2018 rate increase of 6.2% and average annual rate increase 3.5% over 2018 to 2022;
- Lower reliability than Plan A;
- Reliability: SAIDI improves by approximately 3% and SAIFI by 2%, by 2022.

Plan C:

- 2018 Capital spend of $604 million. Average capital spend of $642 million for 2019-2022; high risk of missing business objectives due to a large increase in reliability risk;
- 2018 rate increase of 5.1% and average annual rate increase 2.9% over 2018 to 2022;
- Reliability: SAIDI and SAIFI decline by approximately 2% by 2022; and
- Lower value for money as unplanned corrective work increases.

Ultimately it was decided to adopt Plan B "as modified" resulting in capital spend reductions and additional OM&A savings from the corporate common groups in 2018 that would attain a 5.8% rate increase. Given the requirements of Hydro One's distribution system assets, the lower

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