AMPCO-1

Reference

Exhibit 1, Tab 3, Schedule 1, p. 1

Alectra indicates the investments that are contemplated in the DSP are not based on historical expenditures of the utilities that together have formed Alectra. Rather, they are based on a data-driven asset management framework.

a) Did the historical expenditures of the legacy utilities inform the development and level of spending in the DSP in any way? If yes, please explain.

b) Did the historical Asset Condition Assessments (ACAs) of the legacy utilities inform the development and level of spending in the DSP in any way? Please explain.

Response:

a) Alectra Utilities first consolidated capital plan for Alectra Utilities was built "from the ground up" to address the needs of the system as a whole in consideration of identified priorities and preferences of Alectra Utilities customers and a range of other planning considerations. Historical expenditures provided support for determining the appropriate levels of reactive expenditure budgets.

b) Historical Asset Condition Assessments ("ACA") of the legacy utilities did not inform the development and level of spending in the DSP. Alectra Utilities harmonized its ACA leveraging best practices. Kinectrics conducted an assessment of the harmonized Alectra Utilities ACA, specifically Alectra's ACA processes and methodology, data harmonization methodology and assumptions, review of Health Index models and assumptions, review of sustainment selection methodology and assumptions, and a review of the proposed paced sustainment plan derived from the ACA. Please refer to Exhibit 4, Tab 1, Schedule 1, Appendix E – Kinectrics Inc. ACA Assurance Review, for Kinectrics' findings.

The new harmonized Alectra Utilities ACA was one of a number of inputs into the Asset Management Process, which was used to develop Alectra Utilities' DSP. For more information on Alectra Utilities Asset Management Process, please refer to Exhibit 4, Tab 1, Schedule 1, Page 139, Figure 5.3.1-2: Asset Management Process.

AMPCO-2

Reference

Exhibit 1, Tab 3, Schedule 1, p. 3

Alectra Utilities is entering a period of heightened capital asset renewal, as a large population of deteriorating assets are reaching their end-of-life.

a) Please provide Alectra's definition of end-of-life.

b) Please provide the total number of Alectra's assets and the corresponding total percentage that are beyond end-of-life at the end of 2018.

c) Please provide the percentage at end-of-life at the end of 2013.

d) Please provide the total number of assets by operational area and the percentage in each area that are beyond end-of-life.

Response:

a) From the asset management perspective, beyond end-of-life is when an asset reaches deteriorated conditions and can no longer perform its intended function in a reliable and economical manner or becomes functionally obsolete. Please refer to Exhibit 4, Tab 1, Schedule 1, p. 235 of 438.

Deteriorated assets include assets with Health Index categorization of Very Poor and Poor according to asset condition assessment. For more information on Health Index Categorization, please refer to Exhibit 4, Tab 1, Schedule 1, Appendix D – Asset Condition Assessment -2018, p.17.

b) There are a total of 303,600 assets in Alectra Utilities' service territories – of which 17,782 or 6% are past their end-of-life (Very Poor and Poor). Table 1 below shows the breakdown of the total number based on two asset groups: individual assets quantified in units, and linear assets quantified in kilometers.

c) **Table 1 - Percentage of Assets at end-of-life in 2018**

Asset Group Category	Count of Assets in Very Poor & Poor	% of Assets in Very Poor & Poor	Total Count	Unit
Non-linear/Individual Assets	14,229	5%	265,060	unit
Linear Assets (cables and conductors)	3,553	9%	38,540	km
All Assets - Total	**17,782**	**6%**	**303,600**	

d) As defined in AMPCO-2 (a), end-of-life is condition-based. Asset Condition Assessment using Health Indices is a snapshot in time of the assets' health. Former legacy companies performed ACAs at different periods of time and frequencies as shown in Table 2. In addition to conducting the legacy ACAs at different periods in time, each legacy ACA was informed by different sets of information and models. As a result, Alectra Utilities is not able to provide the percentage at end-of-life at the end of 2013.

Table 2 – Predecessor Utility ACA – Year Performed

Legacy Utility	ACA Year
PowerStream	2017
Guelph Hydro	2014
Enersource	2015
Horizon Utilities	2013
Brampton Hydro	2013

Please refer to Table 3 and Table 4 below for the breakdown of assets past end-of-life based on Alectra Utilities' operating areas. Please note that assets past end-of-life is defined as assets that are in Very Poor and Poor condition based on the Health Index categorization.

Table 3 – Breakdown of Linear Assets (Cable & Conductors) Past EOL by Operating Area

Operating Area	Linear Assets Past EOL (km)	Total Linear Assets (km)	Linear Assets Past EOL (%)
Central North	430	4,514	9.5%
Central South	1,042	11,338	9.2%
West	1,161	5,439	21.3%
East	808	15,091	5.4%
South West	112	2,158	5.2%
Total	**3,553**	**38,540**	**9.2%**

Table 4 – Breakdown of Non-linear/Individual Assets Past EOL by Operating Area

Operating Area	Non-linear Assets Past EOL (units)	Total Non-linear Assets EOL (units)	Non-linear Assets Past EOL (%)
Central North	2,135	30,068	7.1%
Central South	5,307	49,426	10.7%
West	5,352	77,502	6.9%
East	1,045	91,371	1.1%
South West	390	16,693	2.3%
Total	**14,229**	**265,060**	**5.4%**

AMPCO-3

Reference

Exhibit 1, Tab 3, Schedule 1, p. 5

Alectra indicates that Figure 2 shows that the level of system renewal investment proposed in the DSP (i.e., the green line) is already significantly below the level dictated by the condition of the utility's assets.

Please show the underlying calculation and provide the numerical values for each year and the calculation of the level dictated by the condition of the utility's assets (Blue Bars-Condition Base Required – Planed SR $MM).

Response:

Alectra Utilities' projected assets that require renewal over the long-term by estimating the number of units expected to fail in each year. Failed assets are replaced with new assets at the cost of the asset in that year. Asset costs are estimated in 2019 and increased by inflation (2.15% per annum).

The failure rate is given by the equation:

$$f(t) = e^{\beta(t-\alpha)}, where$$

$$t: age\ (years)$$

$$\alpha, \beta: \text{constants}$$

The same α, β used in the age component of the Health Index of each asset is used.
The method produced a significant backlog, which Alectra Utilities paced over the projection period.

<u>Example for calculating failure quantities:</u>

Consider an asset distribution of 100 five-year-old units, 20 ten-year-old units, and 50 twenty-year-old units. Assume that the failure rates for 5, 10, and 20 year old units for this asset class are *f(5)* = 0.02, *f(10)* = 0.05, *f(20)* = 0.1 failures per year, respectively. In the current year, the projected failure quantity is 100(.02) + 20(0.05) + 50(0.1) = 2 + 1 + 5 = 8 failures.

In the following year, the resulting asset distribution is as follows: 8 one-year-old units, 98 six-year-old units, 19 eleven-year-old units, and 45 twenty-one-year-old units.

Assume that the failure rates for 1, 6, 11, and 21 year old units for this asset class are *f(1)* = 0, *f(6)* = 0.03, *f(11)* = 0.06, *f(21)* = 0.11 failures per year, respectively. Therefore, the projected failure quantity in year 2 is 8(0) + 98(0.03) + 19(0.06) + 45(0.11) = 0 + 3 + 1 + 5 = 9 failures.

Table 1 shows the corresponding values for the blue bars- Condition Base Required – Planed SR $MM shown in Exhibit 1, Tab 3, Schedule 1, Figure 2, p. 5

Table 1 – Total Cost System Renewal Needs

Year	Total Cost - System Renewal Needs ($MM)
2019	$249.79
2020	$271.49
2021	$267.75
2022	$242.42
2023	$225.12
2024	$209.92
2025	$209.37
2026	$206.59
2027	$209.73
2028	$271.04
2029	$300.55
2030	$328.89
2031	$348.66
2032	$357.67
2033	$352.11
2034	$328.51
2035	$311.23
2036	$296.12
2037	$297.57
2038	$311.32

AMPCO-4

Reference

Exhibit 1, Tab 3, Schedule 1, p. 5

In order to ensure that customers pay no more than is necessary to fund prudent capital expenditures over the DSP period, Alectra Utilities proposes to establish a Capital Investment Variance Account to track the difference between the capital funding provided through M-factor riders and the utility's actual capital investments. This account will operate symmetrically, such that customers will be refunded for overall under-investment and any prudent spending above the level funded through M-factor riders will be recovered by Alectra Utilities.

a) From Alectra's perspective, what are the circumstances/factors that would drive an overspend above the level funded through the M-factor, taking into consideration any historical capital overspending?

b) Please reconcile potential M-factor overspending recovery with Alectra's desire to provide rate certainty.[1]

Response:

a) Alectra Utilities cannot speculate on the potential drivers for over or under spending over the 5-year DSP period. In order to mitigate risk for customers Alectra Utilities proposes to establish a Capital Investment Variance Account ("CIVA") as provided in Exhibit 2, Tab 1, Schedule 4. The CIVA will track the difference between the capital funding provided through M-factor riders and the actual capital investments during the term of the DSP.

b) One of Alectra Utilities' concerns with the ICM framework is that it requires annual requests for incremental capital funding, which makes it difficult to plan and efficiently implement a 5-year DSP. As Alectra Utilities indicates in Exhibit 2, Tab 1, Schedule 4, page 1, the M-factor – and the resulting M-factor riders described in Exhibit 2, Tab 1, Schedule 3, pp. 17-19 - provide both customers and the utility with certainty and stability in respect of incremental capital funding over the full five-year term of the DSP. Further, as Alectra Utilities indicates in Exhibit 2, Tab 1, Schedule 4, with respect to the proposed CIVA, customers will be refunded for overall under-investment and any prudent spending will be subject to OEB review.

[1] Transcript Presentation Day August 7, 2019 P4

AMPCO-5

Reference

Exhibit 2, Tab 1, Schedule 3, p. 7

Alectra indicates a rate rider will be established by rate zone based on the investments planned in each of Alectra Utilities operational areas.

Please provide a list of the investments planned by operational area.

Response:

Please see Alectra Utilities' response to G-Staff-4 for the M-Factor project listing.

AMPCO-6

Reference

Exhibit 2, Tab 1, Schedule 3, p. 14, Table 5

Table 5 provides M-factor needs totalling $265 million.

Please provide a further breakdown of Table 5 by rate zone.

Response:

Please see Alectra Utilities' response to G-Staff-4 for the M-factor project listing.

AMPCO-7

Reference

Exhibit 4, Tab 1, Schedule 1, p. 13

Should Alectra Utilities not receive sufficient funds to implement the renewal as proposed in this DSP, Alectra Utilities will have to defer essential system renewal investments which are projected to have a significant negative impact on reliability. Under the partial funding scenario reflected in Figure 5.0 - 8 (i.e., purple line), Alectra Utilities' customers would experience a projected worsening of reliability by 50% over the next five years, and a further deterioration of 112% over the next ten years, relative to the most recent five-year outage duration average.

Please provide the calculations that underpin the above worsening of reliability projections and provide all assumptions.

Response:

Please see Alectra Utilities'' response to G-Staff-62 a) for the calculations, projections and assumptions which generated the projection of worsening reliability.

AMPCO-8

Reference

Exhibit 4, Tab 1, Schedule 1, p. 20

Alectra Utilities' investment planning process has been guided by its Corporate Strategy, which was established by Alectra Utilities' Executive Management Team on March 1, 2017 and endorsed by its Board of Directors.

Please provide a copy of the Corporate Strategy that was approved by Alectra's Board of Directors.

Response:

Alectra Utilities' Corporate Strategy, dated March 1, 2017, is provided as Attachment 1 (AMPCO-8_Attach 1). Please note that certain portions of Attachment 1 relate to Alectra Inc.'s unregulated business activities. These aspects are not relevant to the Application and have been redacted.

AMPCO-8

ATTACH 1

Alectra STRATEGIC PLAN

(2017 - 2021) March 1, 2017

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STRATEGIC PLAN (2017 - 2021)

LETTER FROM THE CHAIRMAN OF THE BOARD OF DIRECTORS AND THE PRESIDENT & CEO

The electricity sector, and more broadly the energy sector, continues to undergo transformational change driven by government policy, the economy, climate change, technology, customer expectations and demographic trends. As the sector evolves, Alectra must also evolve to maintain and increase its value to customers. To prepare for these coming changes, we have developed a five-year corporate strategy, defining our goals and strategic objectives during this period of transformation. The strategy will inform the development of our annual business plans and allows us to maintain a clear focus on priorities, success drivers and measures.

Over the last few years, the local electricity distribution companies that have formed Alectra have been significant contributors to the evolution of the electricity sector. As high-performing and progressive utilities, they took the initiative to create Alectra in order to bring more value to customers and shareholders. The scale and depth of Alectra creates a platform for making a greater contribution to the sector, delivering better performance and developing an even more progressive business.

Guided by our vision of a world where people, businesses and communities benefit from energy's full potential, we remain focused on maintaining and improving on our responsibilities in electricity distribution. As well, we intend to be a leader in providing integrated and technologically advanced energy solutions to our customers.

Our five-year strategy is designed around our four strategic themes: managing the transition; optimizing operations and enhancing customer experience; growing the business; and building corporate resilience. Designed to help define the priorities of Alectra over the next five years, this strategy focuses on:

- delivering the intended synergistic outcomes of the merger
- high operational performance
- responsive services to customers
- growth in our core & non-regulated businesses
- cultivation of a Alectra high performance culture

Engagement continues to be a priority for Alectra and we look forward to continuing to work with our sector partners, communities, customers, shareholders and stakeholders. Our goal is to provide optimal service to better serve the energy sector during these changing times.

Norm Loberg
Chairman of the Board of Directors
Alectra Inc.

Brian Bentz
President & CEO
Alectra Inc.

VISION, MISSION AND VALUES

Alectra plans to be a leading integrated and innovative energy solutions provider. More specifically, we intend to be a leader in providing integrated and technologically-advanced energy products and services for our customers. These solutions will help our customers with issues related to: on-grid and off-grid energy technology, energy usage management, cost management and a variety of other considerations. In addition, they will include renewable electricity generation and may include solutions that involve other utility services. We will be committed and focused on excellence, sustainable growth, innovation and best-in-class performance. Our delivery will be reliable, safe and efficient.

Our vision and mission capture the preceding – our vision leads the way and our mission describes how we'll get there. And, as we strive to achieve this vision, we will be grounded in our approach. Our values provide the framework for how we conduct business and define Alectra as an organization.

VISION AND STRATEGIC INTENT

We will be Canada's leading electricity distribution and integrated energy solutions provider, creating a future where people, businesses, and communities will benefit from energy's full potential.

MISSION AND POSITIONING STATEMENT

We provide customers with smart and simple energy choices, while creating sustainable value for our shareholders, customers, communities and employees.

VALUES

Customer Focus – Earn and keep our customers, by delivering value, while acting as a trusted advisor and strategic partner

Innovation – Drive the business forward through the continuous improvement (and integration) of people and processes with technology

Excellence – Make the complex simple and continuously improve our performance

Quality – Foster our fundamentals at the highest level of safety, reliability, and dependability

Respect – Ensure a respectful and rewarding work environment for all employees by collaborating as one team and acting with integrity

Community – Provide sector-leading service and partner to build sustainable communities

Sustainability – Balance economic efficiency, social equity and environmental accountability

ENVIRONMENTAL SCAN

The development of Alectra's strategy included a comprehensive scan of the external environment and an assessment of its strengths and weaknesses. Key considerations that could impact the organization include:

Political and Economic Outlook

At the Federal and global level, there is a renewed commitment to combatting climate change. The Federal government has taken a leadership role with the Provinces in this area. The Province of Ontario's political agenda will continue to support consolidation in the electricity distribution sector, regionalization, conservation and renewable and distributed energy investments. According to the Independent Electricity System Operator (IESO) electricity demand is expected to remain relatively flat over the next 20 years due to: the efforts of conservation and energy efficiency; the increase in embedded generation; and the change in the economy to less energy-intensive industries. Low interest rates, oil prices and economic growth will continue to have an impact on investments and consumption.

The Climate Change Action Plan (CCAP)

The Climate Change Action Plan (CCAP) in Ontario and the Province's related legislation will drive change in the types of energy production and consumption. Extreme weather is an increasing risk. As a result, there is greater focus on pursuing mitigation measures to increase resiliency. The electricity sector plays a significant role in maintaining a reliable, efficient and sustainable electricity system by remaining committed to emissions reduction targets. Low carbon legislation will create challenges and opportunities, involving cap and trade regulation and conservation targets.

Emerging Technologies

The electricity sector is evolving with the emergence of advanced technology including microgrids, discrete energy systems consisting of distributed energy sources, energy storage, demand management technologies and smart energy systems. These technologies are shaping the way we do business, becoming more viable and economic. Opportunities and challenges include: growth and investment in new technologies, grid parity of wind and solar power, improvement of system performance and efficiency with electricity storage, and the related risks of customers moving off-grid with distributed generation.

Consumer Experience

Customers are becoming increasingly engaged and involved in managing their energy consumption. With new technologies being integrated into an increasingly connected world, customers will have the tools to manage their energy consumption in a more responsible manner than in the past, integrating data from

appliances, thermostats, vehicles and many other devices.

The new energy consumer's preferences are evolving to reflect customer choices, now being made as a result of new technologies. The energy customer of the future (the so called "Uber" customer) may look for alternative solutions in order to remain relevant in a 24/7 connected world.

In Ontario, customers have become increasingly concerned about the rising cost of electricity. This concern has led the Province of Ontario to initiate a series of measures to reduce upward pressure on electricity rates. Continued customer concerns may influence other provincial electricity policy decisions. Alectra will focus on ensuring it delivers value to customers at all times.

Regional Planning

With the increase in distributed energy resources, demand management solutions and a more engaged customer base, a greater emphasis is being put on regional planning and how local resources can meet regional reliability needs.

Customers are becoming more informed about how energy services are provided to their communities. Integrating and coordinating regional and bulk planning efforts will be critical in developing cost-effective energy solutions for the overall reliability of the electricity system.

Cyber Security

As the electricity system becomes more distributed, cyber security threats will become more diverse, posing additional risks to the reliability of the electricity system. As a result, there is a growing need for greater collaboration and information sharing of cyber security practices to protect electricity system operations and critical business information.

Comunity, Customer and Stakeholder Engagement

More engaged customers, a greater focus on regional planning, a more interconnected electricity system, an evolving sector and multiple stakeholders – these factors all emphasize the need for Alectra to inform and engage communities, customers, shareholders and other stakeholders on electricity matters that may affect them. Engagement must remain a key priority for Alectra.

Corporate Resilience

A significant percentage of the energy sector workforce is approaching retirement age. To meet this challenge, we must invest in our people and processes to ensure an engaging work environment, providing development programs and career opportunities. Alectra must be a focused and flexible organization in order to succeed in the ongoing transformation of the energy industry.

ALECTRA STRATEGY AT A GLANCE (2017 - 2021)

The Key considerations identified during the environmental scan helped frame the development of Alectra's strategy for the next five years. Built on the company's four core themes: managing the transition; optimizing operations and enhancing customer experience; growing the business; building corporate resilience, Alectra set five corporate goals (includes two under "Growing the Business") and 26 strategic objectives to broadly define the processes to achieve these goals.

THEMES (WHAT WE DO)	MANAGING THE TRANSITION	OPTIMIZING OPERATIONS AND ENHANCING CUSTOMER EXPERIENCE	GROWING THE BUSINESS	BUILDING CORPORATE RESILIENCE
STRATEGIC GOALS (WHAT WE WANT TO ACHIEVE IN THE NEXT 5 YEARS)	• **Deliver the outcomes planned in the merger business case**	• **Optimize the operation of assets and related processes and enhance customer experience in a financially prudent manner**	• **Grow the core business through mergers and acquisitions as well as regional and community planning initiatives** • [redacted]	• **Invest in our people and processes to meet the needs of our customers and stakeholders**
STRATEGIC OBJECTIVES (HOW WE WILL ACHIEVE OUR GOALS)	• Achieve the post-merger integration synergies and shareholder dividends outlined in the merger business case • Maintain or exceed existing customer service levels, reliability performance and employee engagement • Evolve the separate corporate cultures into a Alectra culture • Continue to make process improvements for best-in-class status • Provide regular and comprehensive communications to all our shareholders, customers, employees and other stakeholders	• Optimize operations and asset lifecycle management and related processes regarding asset rehabilitation and renewal • Invest in and leverage emerging technologies to enable and enhance operations optimization • Enhance grid integration to enable continued conservation & demand management and distributed generation endeavors • Enhance reliability through smart grid initiatives • Advocate for more predictable and balanced rate regulation to protect existing revenue streams, and to acquire new revenue streams • Proactively enhance customer engagement and levels of service • Develop engaging customer relationships that leverage various channels/ technologies, including social media • Maintain and continue to improve upon our strong safety record	**Core business:** • Continue to explore and pursue merger and acquisition opportunities that are value accretive, with a preference to greater urban density and geographic contiguity - at the same time, expand our service area to the full extent of our municipal boundaries • Explore and pursue innovative ways to obtain capital to finance acquisitions • Service organic growth requirements by building integrated regional and community smart energy plans, promoting sustainability, affordability and reliability [redacted]	• Strengthen the development and engagement of our employees • Attract and retain the best talent • Be a focused, sustainable and flexible organization positioned to succeed in the evolving market, in the energy industry and in the face of increasingly extreme weather due to climate change • Continuously optimize business practices and processes to best-in-class performance

STRATEGIC GOAL

"DELIVER THE OUTCOMES PLANNED IN THE MERGER BUSINESS CASE"

- **Achieve, or exceed the post-merger integration synergies and shareholder dividends outlined in the merger business case**
- **Maintain or exceed existing customer service levels, reliability performance and employee engagement**
- **Evolve the separate corporate cultures into a Alectra culture**
- **Continue to make process improvements for best-in-class status**
- **Provide regular and comprehensive communications to all our shareholders, customers, employees and other stakeholders**

Alectra is poised to succeed through post-merger integration and to realize the synergies expected from the combination of the four utilities, while continuing to meet or exceed the pre-merger performance standards in all areas. During and after the integration, important emphasis will be on continuous process improvement and creating the Alectra culture.

Alectra will achieve this strategic goal by:

- Developing and executing a comprehensive post-merger integration plan that realizes the planned synergies and establishing the transformation management function to effectively manage the execution of the post-merger integration plan
- Preparing a comprehensive risk assessment (inclusive of risks associated with cyber security) and risk mitigation plan and continuously monitoring the assessed risks through the post-merger transition
- Improving and enhancing management systems and processes to create more value – benchmarking against others and striving for best-in-class status
- Being focused on outcomes and being accountable for performance
- Staying focused on maintaining or exceeding customer service, system performance and employee standards
- Staying ahead of regulatory developments and changes
- Proactively advocating for regulatory and government changes to support the transition
- Proactively keeping the Board and shareholders informed
- Creating the Alectra business environment and culture
- Adopting best practices for accountability and transparency to Stakeholders

STRATEGIC GOAL

"OPTIMIZE THE OPERATION OF ASSETS AND RELATED PROCESSES AND ENHANCE CUSTOMER EXPERIENCE IN A FINANCIALLY PRUDENT MANNER"

- **Optimize operations and asset lifecycle management and related processes regarding asset rehabilitation and renewal**
- **Invest in and leverage emerging technologies to enable and enhance operations optimization**
- **Enhance grid integration to enable continued conservation & demand management and distributed generation endeavours**
- **Enhance reliability through smart grid initiatives**
- **Advocate for more predictable and balanced rate regulation to protect existing revenue streams, and to acquire new revenue streams**
- **Proactively enhance customer engagement and levels of service**
- **Develop engaging customer relationships that leverage various channels/technologies, including social media**
- **Maintain and continue to improve upon our strong safety record**

Alectra's core business of electricity distribution is dependent on high operational performance of its assets and related processes as well as delivering reliable and responsive services to its customers. Focus will be put on improving asset utilization life and performance and related processes as well as managing costs and enhancing customer engagement. Our approach will leverage new technologies, tools and methods.

Alectra will achieve this strategic goal by:

- Streamlining and improving processes to improve asset utilization and performance
- Employing a systematic and best-in-class approach including the use of benchmarking
- Balancing cost with reliability and rehabilitation with renewal
- Framing the approach in a long-term strategic direction for asset management
- Making decisions that are supported by quality data and evidence
- Responding to customers' needs and expectations
- Developing systems and processes that are technologically enabled to create value, engagement and stronger relationships with customers
- Delivering superior customer service that is cost effective and competitive

STRATEGIC GOAL

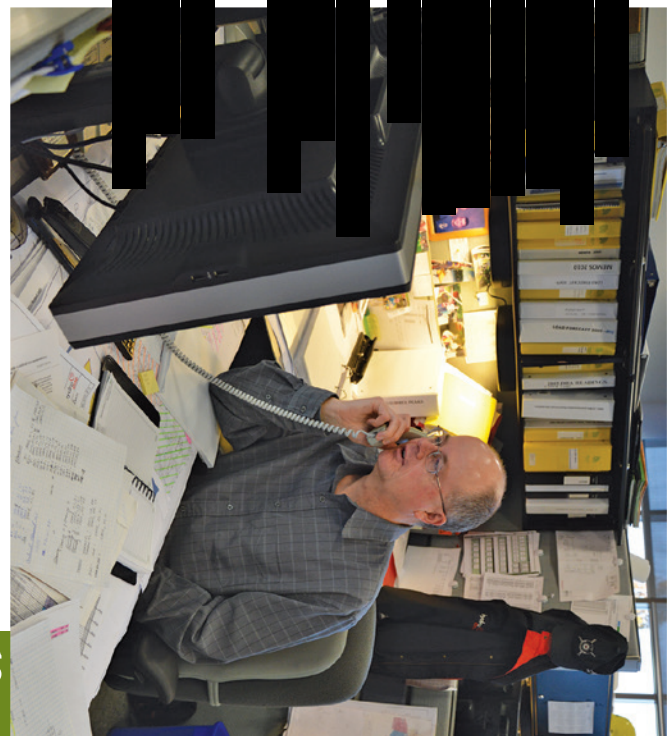
"GROW THE CORE BUSINESS THROUGH MERGERS AND ACQUISITIONS AS WELL AS REGIONAL AND COMMUNITY PLANNING INITIATIVES"

- **Continue to explore and pursue merger and acquisition opportunities that are value accretive, with a preference to greater urban density and geographic contiguity. At the same time, expand our service area to the full extent of our municipal boundaries**
- **Explore and pursue innovative ways to obtain capital to finance acquisitions**
- **Service organic growth requirements by building integrated regional and community smart energy plans, promoting sustainability, affordability and reliability**

Alectra believes that there is value to our customers and shareholders in continuing to grow the company in the current environment for rate-regulated utilities in Ontario. We believe that appropriate size, scale and scope will enable the realization of additional synergies and efficiencies. Continued organic growth in the communities and regions that Alectra serves will be better served by integrated regional and community energy plans that place the stewardship of the environment and our society at the centre of their strategies and operations.

Alectra will achieve this strategic goal by:

- Developing and maintaining an approach to gathering intelligence about market opportunities
- Developing and using a risk and opportunity evaluation framework for the evaluation of growth pursuits
- Growing the core business through mergers and acquisitions to enhance strategic position, acquire further economies of scale and scope, add shareholder and customer value
- Developing strategic partnerships and alliances where appropriate and advantageous
- Exploring and determining the appropriate sources of capital and financing to support core business growth opportunities
- Continuing to pursue and evaluate corporate structures that are most advantageous from a capital attraction perspective
- Developing and executing comprehensive community and regional plans for servicing organic growth



STRATEGIC GOAL

"INVEST IN OUR PEOPLE AND PROCESSES TO MEET THE NEEDS OF OUR CUSTOMERS AND STAKEHOLDERS"

- **Strengthen the development and engagement of our employees**
- **Attract and retain the best talent**
- **Be a focused, sustainable and flexible organization positioned to succeed in the evolving market and energy industry**
- **Continuously optimize business practices and processes to best-in-class performance**

High performing companies create an environment with a unique personality and soul and with a passion for performance, enabling employees to make the right decisions and do the right thing wherever they are in the business. Alectra will make it a key priority to develop and continuously enhance a positive, energized and engaged environment for its employees.

Alectra will achieve this strategic goal by:

- Emphasizing employee innovation, drive, skill, motivation and dedication
- Developing and implementing a competitive compensation structure, positive reward and recognition system, energized environment and encouragement for employee development personally and professionally
- Ensuring employee development and succession planning is in place to retain our best talent
- Creating a safe and healthy workplace
- Being a best-in-class employer
- Delivering effective internal communications
- Fostering innovation and use of new technology
- Creating the Alectra high performance culture
- Continuously improving business practices and processes using benchmarking and other best-in-class tools
- Developing a comprehensive risk assessment and mitigation program

LOOKING **AHEAD**

This strategic plan is a roadmap for Alectra's activities over the next five years. It will help to set the priorities for the organization and provide information for the development of our annual business plans. Alectra will conduct an annual review of its strategy and the sector overall, including an evaluation of the success of the strategy with reference to performance measures, stakeholder input and update the Strategic Plan as necessary. In addition, there is an increase expectation by all stakeholders for corporate responsibility reporting.

alectra

Discover the possibilities

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AMPCO-9

Reference

Exhibit 4, Tab 1, Schedule 1, p. 49, Table 5.2.1-4

Please provide Table 5.2.1-4 for the years 2015 to 2019.

Response:

Please refer to Table 5.4.2-7 in Exhibit 4, Tab 1 Schedule 1 Page 370.

AMPCO-10

Reference

Exhibit 4, Tab 1, Schedule 1, p. 52-53

Please provide the Terms of Reference for the Kinectrics Inc. Review (Appendix E) and the Vanry & Associates Review (Appendix G).

Response:

Please see Alectra Utilities' response to 15-MANA-44.

AMPCO-11

Reference

Exhibit 4, Tab 1, Schedule 1, p. 52

Kinectrics Inc. ("Kinectrics") was retained to undertake an independent, third-party review of Alectra Utilities' Asset Condition Assessment ("ACA").

For each of the legacy utilities, please provide the results of their most recent ACA prior to this combined ACA and identify the party that undertook the ACA.

Response:

Please refer to Figures 1 to 5, which provide the most recent legacy ACA results prior to the harmonized Alectra Utilities ACA. The results provided in Figures 1 to 5 were determined based on the ACA models in use by the predecessor utilities at the time of preparation.

All predecessor ACAs, with the exception of PowerStream, were performed by Kinectrics. PowerStream's ACA was performed "in-house" by PowerStream staff. However, it should be noted that the formulation of each legacy utility's ACA models were informed by the data available from the predecessor utility's asset registers. They took into consideration the type of assets used in the utility.

Figure 1 - PowerStream ACA Results – 2016/2017 (Performed in-house)

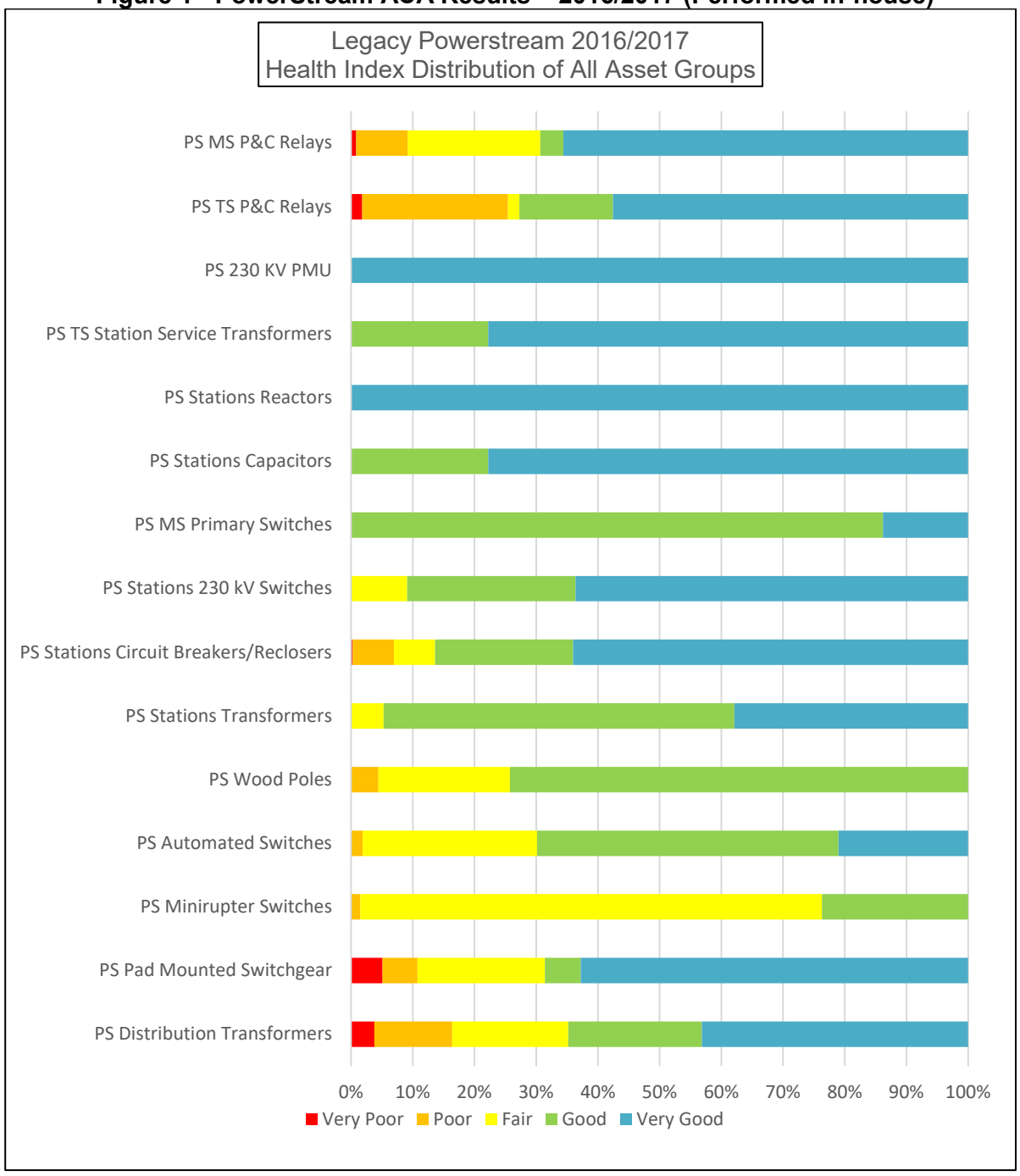


Figure 2 - Horizon Utilities ACA Results – 2013 (Performed by Kinectrics)

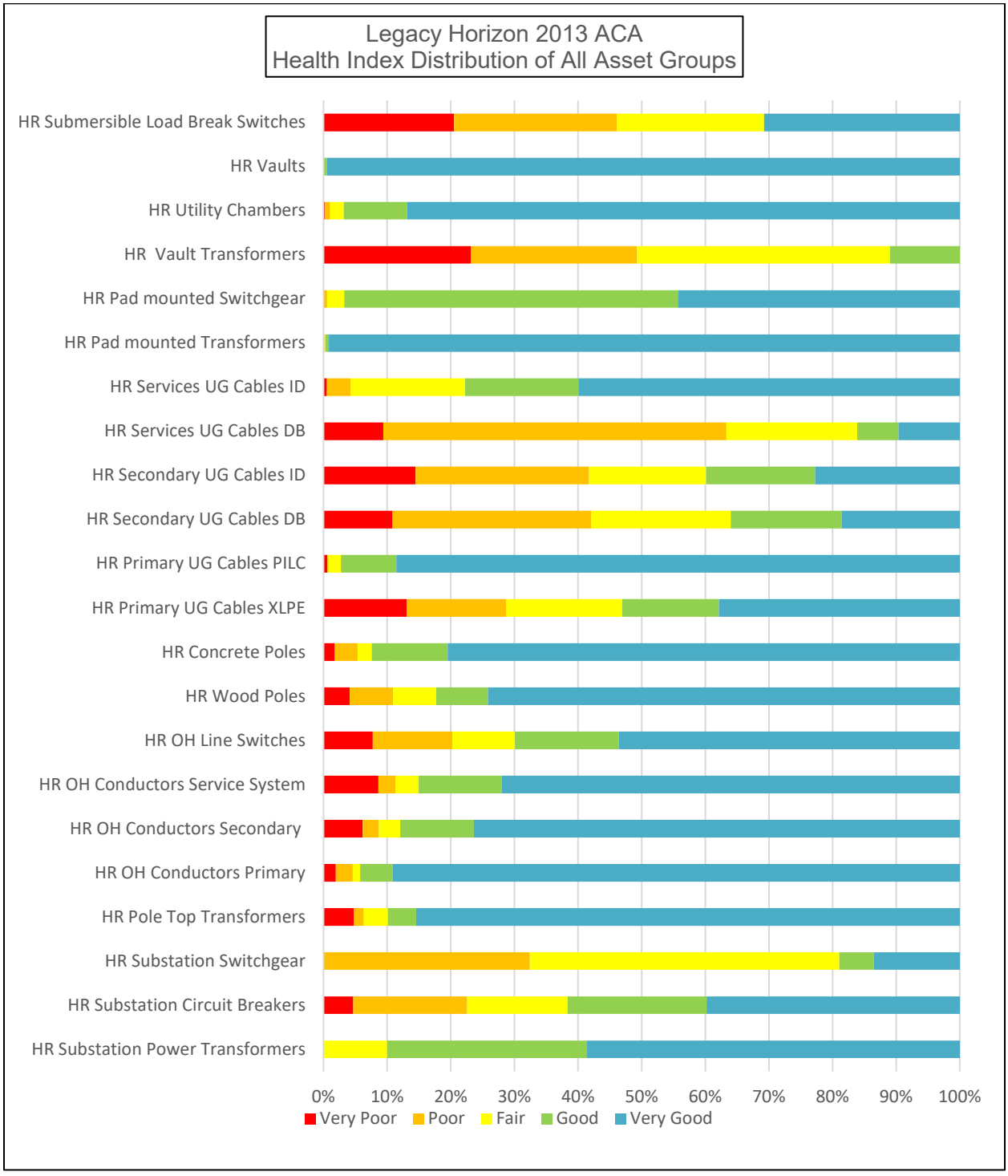


Figure 3 - Enersource Hydro Mississauga ACA Results – 2015 (Performed by Kinectrics)

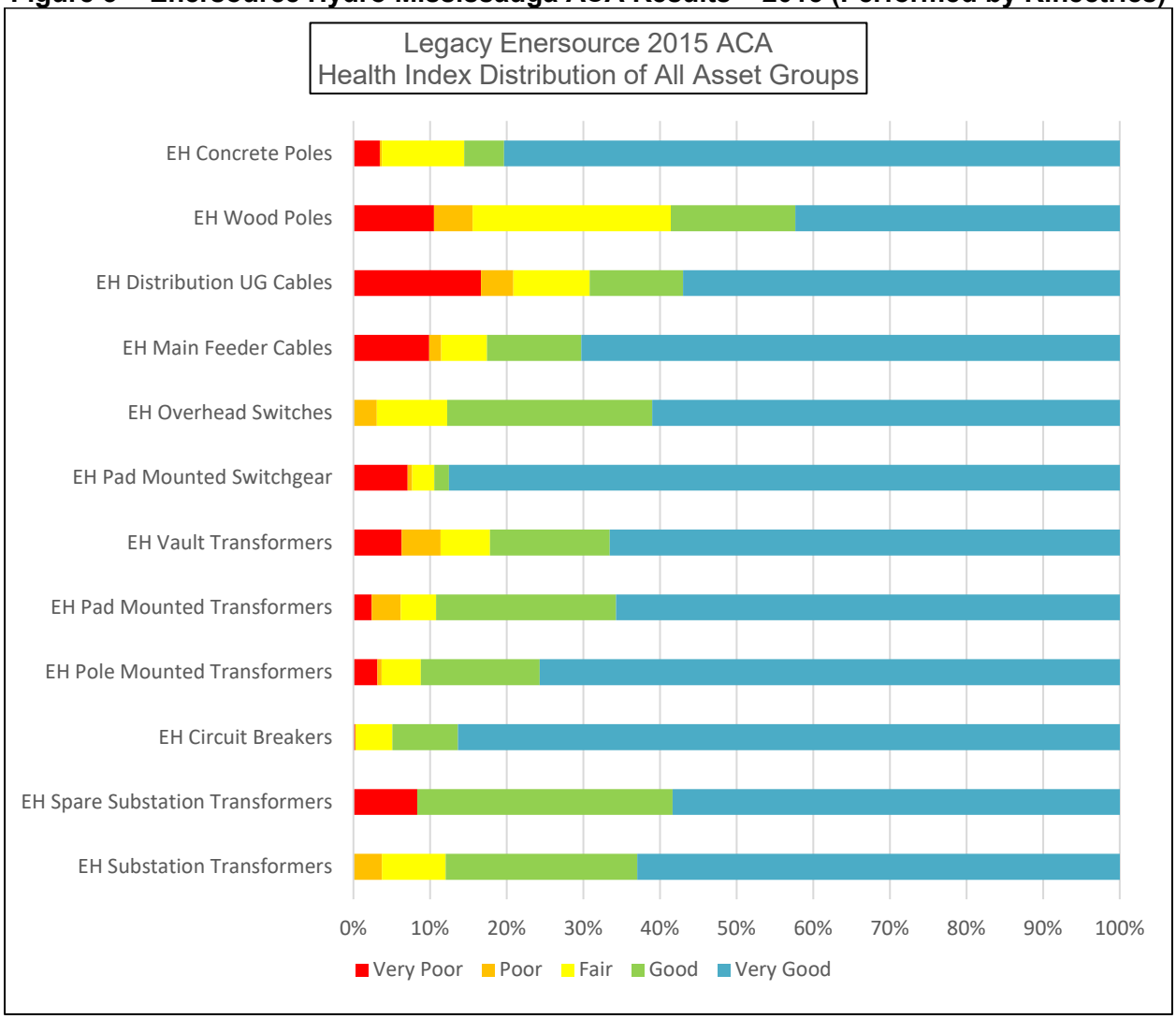


Figure 4 - Brampton Hydro ACA Results – 2013 (Performed by Kinectrics)

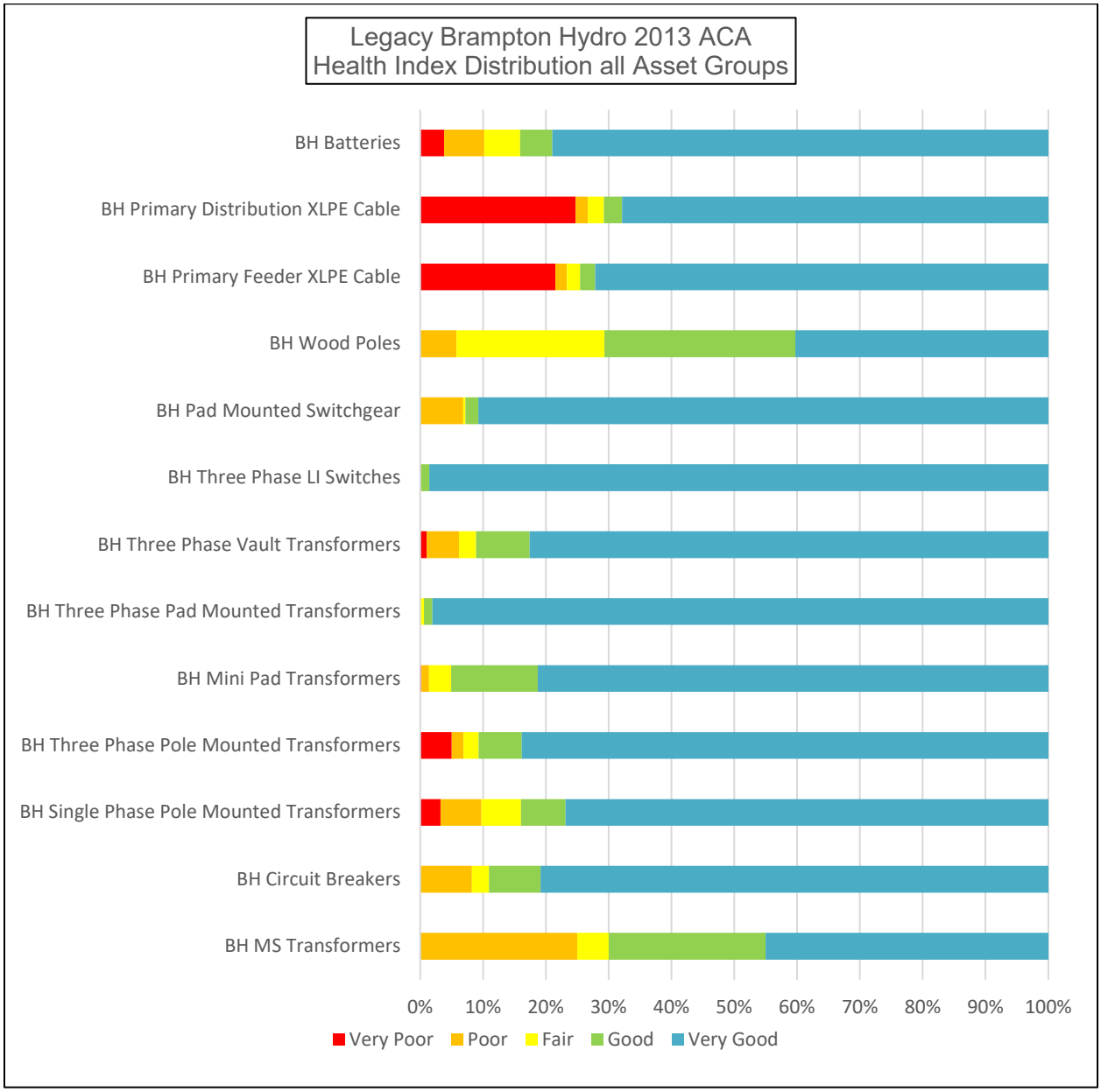
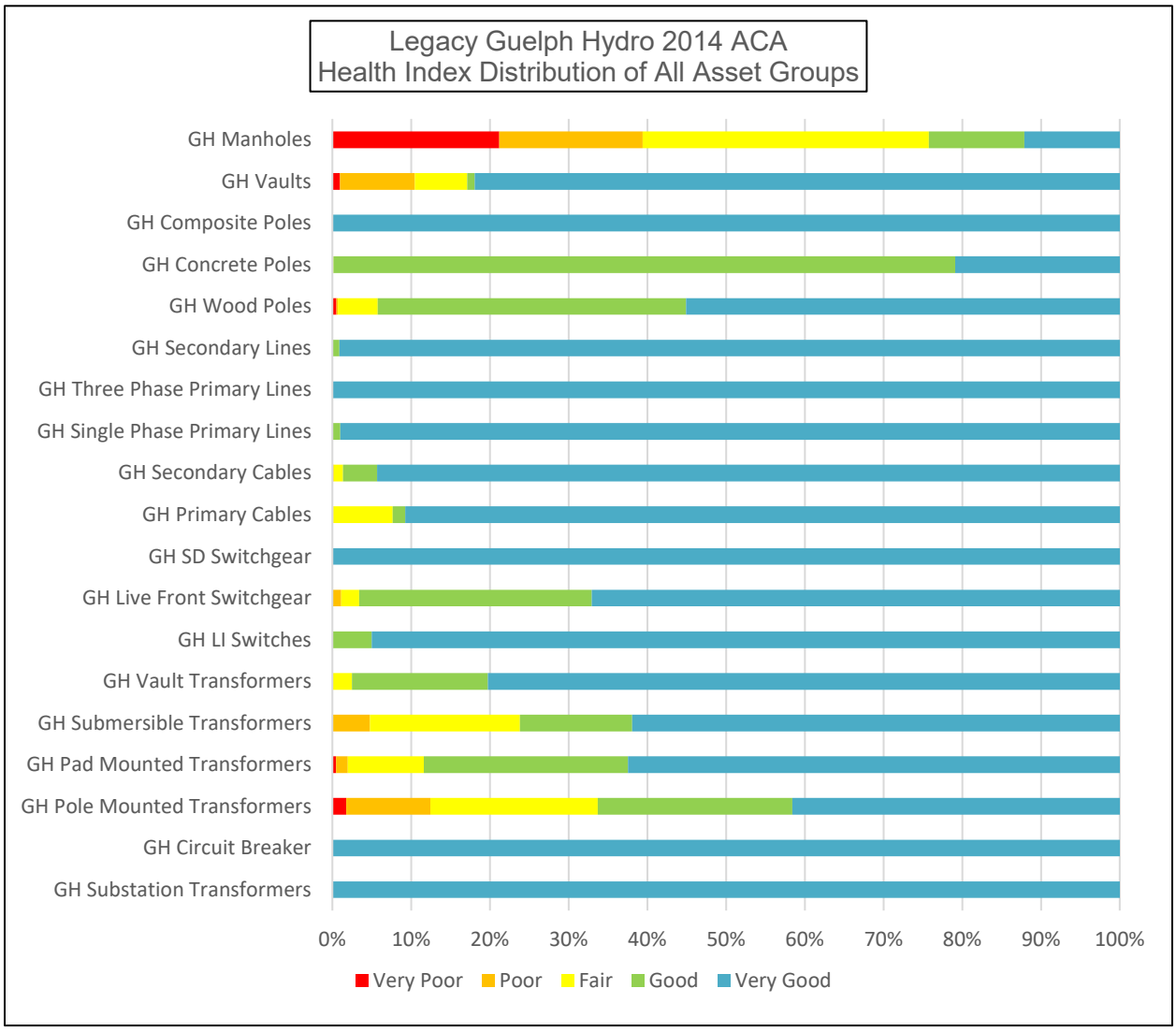


Figure 5 - Guelph Hydro ACA Results – 2014 (Performed by Kinectrics)



AMPCO-12

Reference

Exhibit 4, Tab 1, Schedule 1, p. 101

Underground Cable and cable accessory failures are the leading cause of outages, both in terms of frequency and duration. Over the last five years, Alectra Utilities has experienced an increasing year-over-year trend of underground cable failures. Alectra Utilities has determined that an increasing rate of underground cable failure over this period is an indication that the deterioration of cables is exceeding the historical renewal rate.

a) Please explain if Alectra investigates the root cause of cable failures.

b) Please provide the cable renewal rate for each of the years 2014 to 2018 and forecast 2019 to 2024 and show the calculation.

c) Please provide the cable failure rate for each of the years 2014 to 2018 and show the calculation.

d) Please identify the operational areas with the highest cable failure rates and provide the data.

Response:

a) Alectra Utilities does investigate the cause of cable failures. Alectra Utilities leverages the Outage Management System and internal Reliability Committees to track and review cable failure causes and trends. Reliability Engineers work together with field crews to understand the cause of failure and steps taken to remediate. Alectra Utilities (and its predecessors) have developed an understanding of cable failures and the impacts of deterioration on cable performance. Alectra Utilities understands and has experience with cable testing. This has provided Alectra Utilities with a better understanding of cables and cable failures.

b) Alectra Utilities has provided the cable renewal rate from 2015 to 2024 in Table 1. The calculation is also provided. However, as total cable population is not available for all operational areas each year, nor can Alectra Utilities forecast new development and

the amount of cable required for those developments, Alectra Utilities has provided the rate relative to total cable length population as of the end of 2018 years.

Table 1 - Cable Renewal Rate (2015-2024)

Metric	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cable Replacement (km)	66	72	67	77	82	93	130	140	150	162
Cable Injection (km)	113	71	69	56	134	213	270	305	345	376
Total Cable Renewal (km)	179	143	136	133	216	306	400	445	495	538
2018 Cable Population (km)	22,140	22,140	22,140	22,140	22,140	22,140	22,140	22,140	22,140	22,140
Renewal Rate (Total Cable Renewal / 2018 Cable Population)	0.81%	0.65%	0.61%	0.60%	0.98%	1.38%	1.81%	2.01%	2.24%	2.43%

c) As explained in response to part b), the cable population of operational areas is not available for each historical year. Therefore, Alectra Utilities has used the year-end 2018 cable population for all years. Additionally, Alectra Utilities has modified the assessment from all cable failures to just those related to XLPE failures, since only Alectra West (legacy Horizon Utilities) has additional failures due to PILC cable. Alectra Utilities has provided the requested data and calculation in Table 2.

Table AMPCO 2 - XLPE Cable and Accessory Failures by Operational Area (2014-2018)

Operational Area	2014	2015	2016	2017	2018	Average
East	167	182	179	165	166	172
West	41	57	52	44	57	50
Central South	153	250	251	214	238	221
Central North	36	56	36	41	62	46
Southwest	13	14	23	13	11	15
2018 Cable Population	22140	22140	22140	22140	22140	22140
Failure Rate East	0.75%	0.82%	0.81%	0.75%	0.75%	0.78%
Failure Rate West	0.19%	0.26%	0.23%	0.20%	0.26%	0.23%
Failure Rate Central South	0.69%	1.13%	1.13%	0.97%	1.07%	1.00%
Failure Rate Central North	0.16%	0.25%	0.16%	0.19%	0.28%	0.21%
Failure Rate Southwest	0.06%	0.06%	0.10%	0.06%	0.05%	0.07%

d) As provided in Table 2, the highest rates of cables failures occur in the Central-South operating zone (legacy Enersource), followed by Alectra East (legacy PowerStream), Alectra West (legacy Horizon Utilities), Alectra Central-North (legacy Brampton Hydro) and Alectra Southwest (legacy Guelph Hydro).

AMPCO-13

Reference

Exhibit 4, Tab 1, Schedule 1

a) Does Alectra track asset removals and the age the asset is removed from service? If yes, please describe the process.

b) Does Alectra track the age an asset fails? If yes, please describe the process.

Response:

a) Alectra Utilities does not currently have a formalized process designed to track asset removals and the age at which the asset is removed from service. Alectra Utilities is currently exploring methods and requirements needed to implement such a process.

b) Currently, Alectra Utilities does not have formalized process designed to track the age of failed assets removed from service. While some data related to asset failure age is being captured, it is currently stored in isolated applications and difficult to locate and extract.

AMPCO-14

Reference

Exhibit 4, Tab 1, Schedule 1, p. 102

Alectra indicates that once the cable has reached end of life, the failure rate increases and cables can no longer be repaired and the only option is to replace the cable.

Please confirm Alectra tracks and records the age of cable failures?

Response:

Alectra Utilities has completed studies where the age of the cable at failure was recorded. This provided the basis for the age criteria seen in Exhibit 4, Tab 1, Schedule 1, Appendix A10, page 14, Figure A10 – 8 which separates Area 1 from Area 2. However, currently Alectra Utilities does not have the processes in place to formally track the age of all cable failures in a structured database. Efforts are underway to understand and identfy how Alectra Utilities might implement such processes.

AMPCO-15

Reference

Exhibit 4, Tab 1, Schedule 1, p. 108, Table 5.2.3-5

a) Please explain the reasons for the increase in SAIDI in 2018.

b) Please add a row to the Table to show SAIDI results for the years 2014 to 2018 excluding MEDs and LOS and Scheduled Outages.

Response:

a) Please see Alectra Utilities' response to G-Staff-69 b), which provides a comparison of 2018 to the 5-year average, highlighting cause codes that are above and below that average.

b) Table 1 provides the SAIDI and SAIDI Excluding MEDs, LOS, Scheduled Outages ("SO") results from 2014 to 2018.

Table 1 - Alectra Utilities' SAIDI and SAIDI Excluding MEDs, LOS, SO results from 2014 to 2018

Metric (Hours)	2014	2015	2016	2017	2018
SAIDI	1.30	1.42	1.66	1.10	1.87
SAIDI - Excluding MEDs	0.88	1.05	0.96	0.87	1.14
SAIDI - Excluding LOS	1.12	1.35	1.24	1.03	1.66
SAIDI - Excluding MEDs and LOS	0.84	1.00	0.83	0.80	1.04
SAIDI - Excluding MEDs, LOS and SO	0.74	0.89	0.73	0.70	0.96

AMPCO-16

Reference

Exhibit 4, Tab 1, Schedule 1, p. 110, Table 5.2.3-7

a) Please explain the reasons for the increase in SAIFI in 2018.

b) Please add a row to the Table to show SAIFI results for the years 2014 to 2018 excluding MEDs and LOS and Scheduled Outages.

Response:

a) Please see Alectra Utilities' response to G-Staff-69 b), which provides a comparison of 2018 SAIFI to the 5-year average, highlighting cause codes that are above and below that average.

b) Table 1 provides the SAIFI and SAIFI Excluding MEDs, LOS, Scheduled Outages ("SO") results from 2014 to 2018.

Table 1 - Alectra Utilities' SAIFI and SAIFI Excluding MEDs, LOS, SO results from 2014 to 2018

Metric (Number of Outages)	2014	2015	2016	2017	2018
SAIFI	1.51	1.59	1.43	1.34	1.80
SAIFI - Excluding MEDs	1.27	1.41	1.24	1.23	1.53
SAIFI - Excluding LOS	1.40	1.38	1.24	1.22	1.57
SAIFI - Excluding MEDs and LOS	1.21	1.23	1.09	1.11	1.33
SAIFI - Excluding MEDs, LOS and SO	1.18	1.20	1.05	1.07	1.30

AMPCO-17

Reference

Exhibit 4, Tab 1, Schedule 1, p. 110, Table 5.2.3-4

a) Please provide Figure 5.2.3-4 including Scheduled Outages.

b) Please provide Figure 5.2.3-4 for each of the years 2014 to 2018 including Scheduled Outages.

Response:

a) Alectra Utilities confirms that Figure 5.2.3-4 in Exhibit 4, Tab 1, Schedule 1, Page 112 includes Schedule Outages.

b) Alectra Utilities provides Figures 1-5 as annual allocation of customer hours of interruption by cause code, including scheduled outages.

Figure 1 - Alectra Utilities' 2014 Customer Hours of Interruption

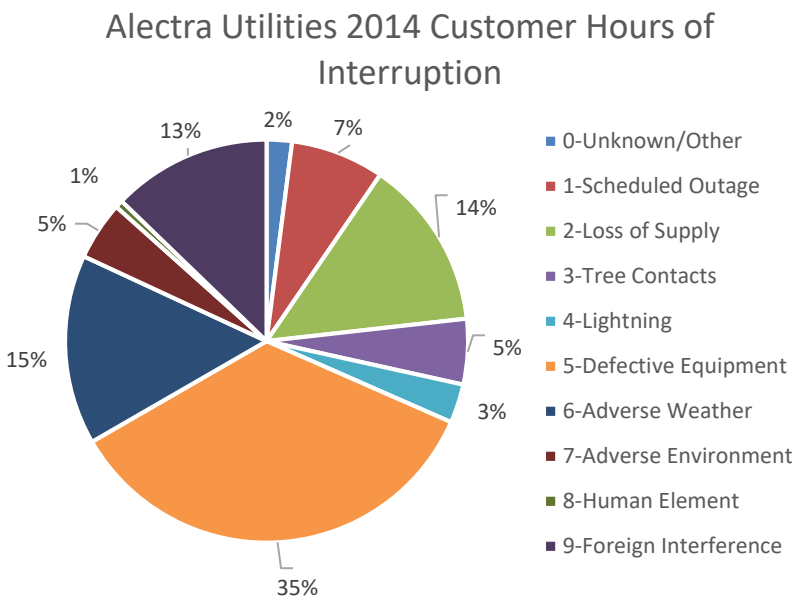


Figure 2 - Alectra Utilities' 2015 Customer Hours of Interruption

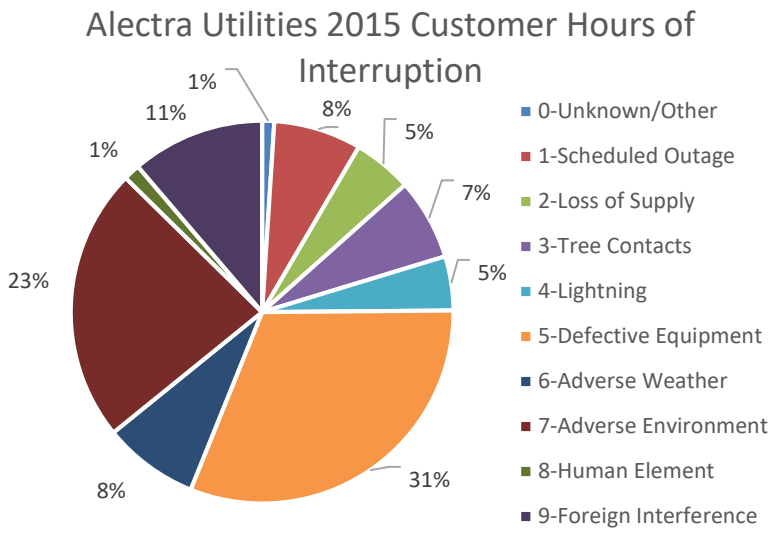


Figure 3 - Alectra Utilities' 2016 Customer Hours of Interruption

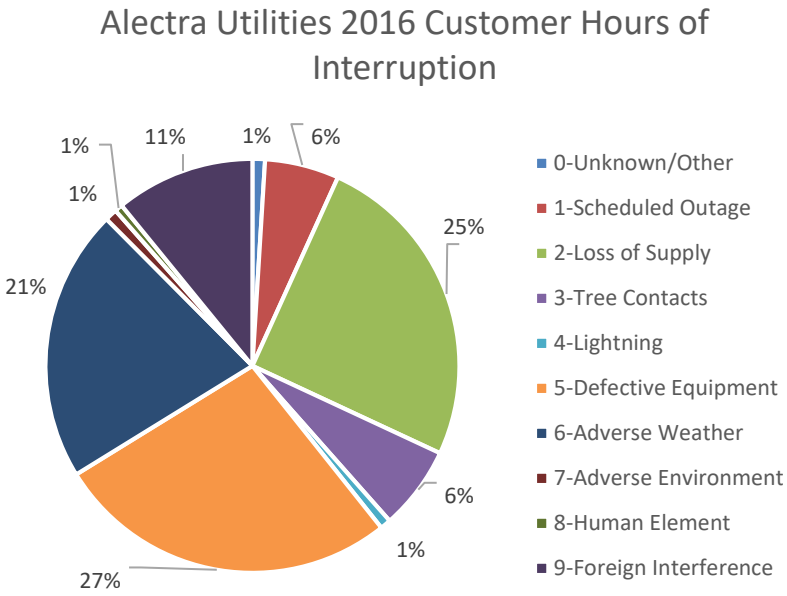


Figure 4 - Alectra Utilities' 2017 Customer Hours of Interruption

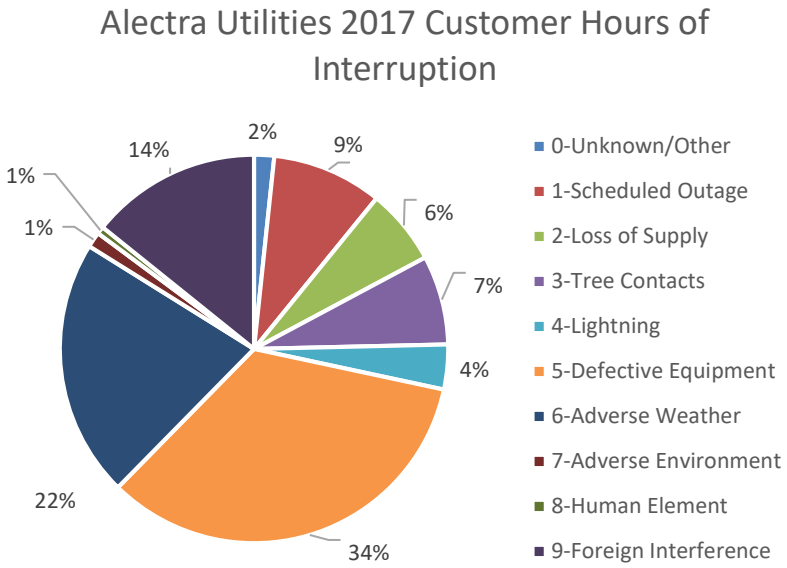
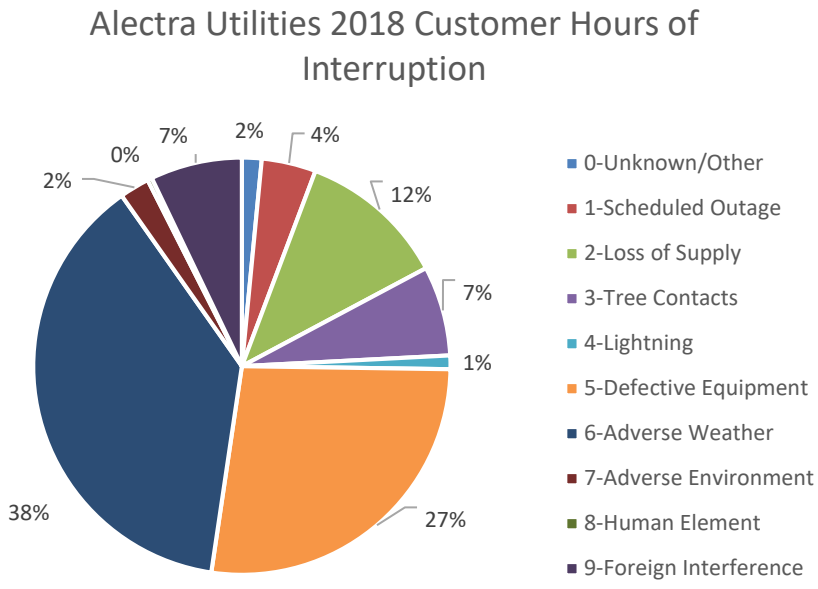


Figure 5 - Alectra Utilities 2018 Customer Hours of Interruption



AMPCO-18

Reference

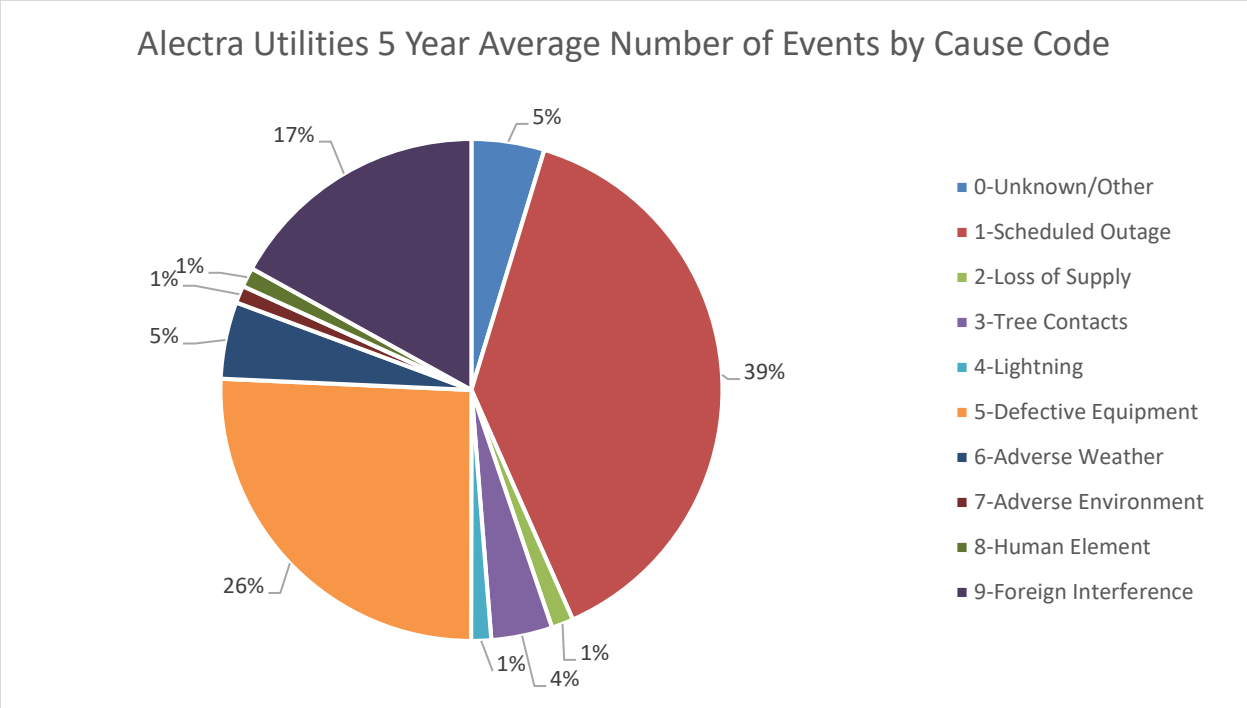
Exhibit 4, Tab 1, Schedule 1, p. 113, Table 5.2.3-5

a) Please provide Figure 5.2.3-5 including Scheduled Outages.

b) Please provide Figure 5.2.3-5 for each of the years 2014 to 2018 including Scheduled Outages.

a) Alectra Utilities has provided the 5 year (2014 – 2018) average number of events by cause code in Figure 1, including scheduled outages.

Figure 1 - Alectra Utilities' 5 Year Average Number of Events by Cause Code



b) Alectra Utilities has provided the number of events by cause code for each year (2014-2018) in Figures 2-6.

Figure 2 - Alectra Utilities' 2014 Number of Events by Cause Code

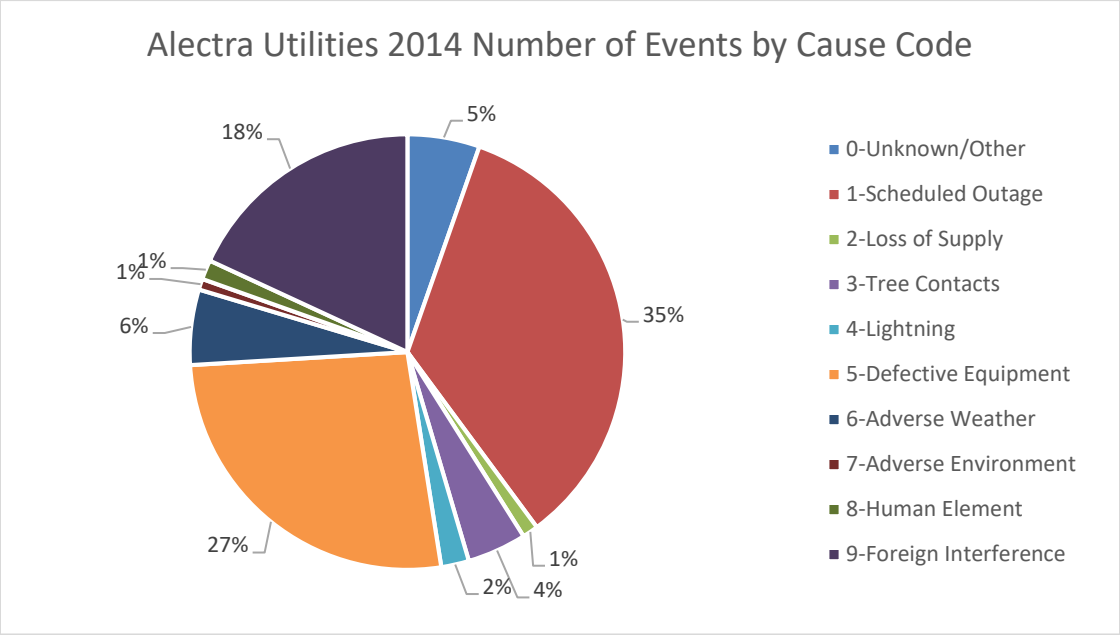


Figure 3 - Alectra Utilities' 2015 Number of Events by Cause Code

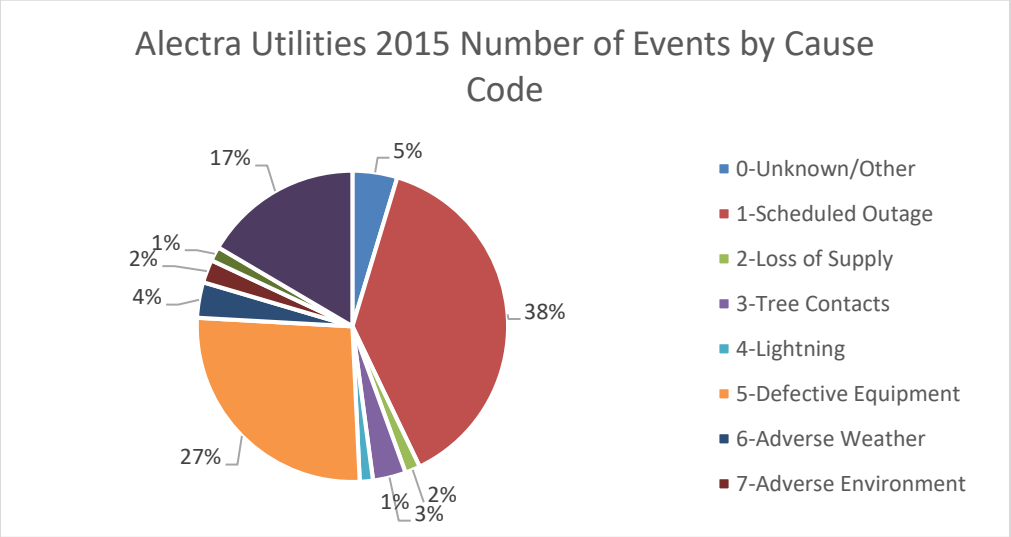


Figure 4 - Alectra Utilities' 2016 Number of Events by Cause Code

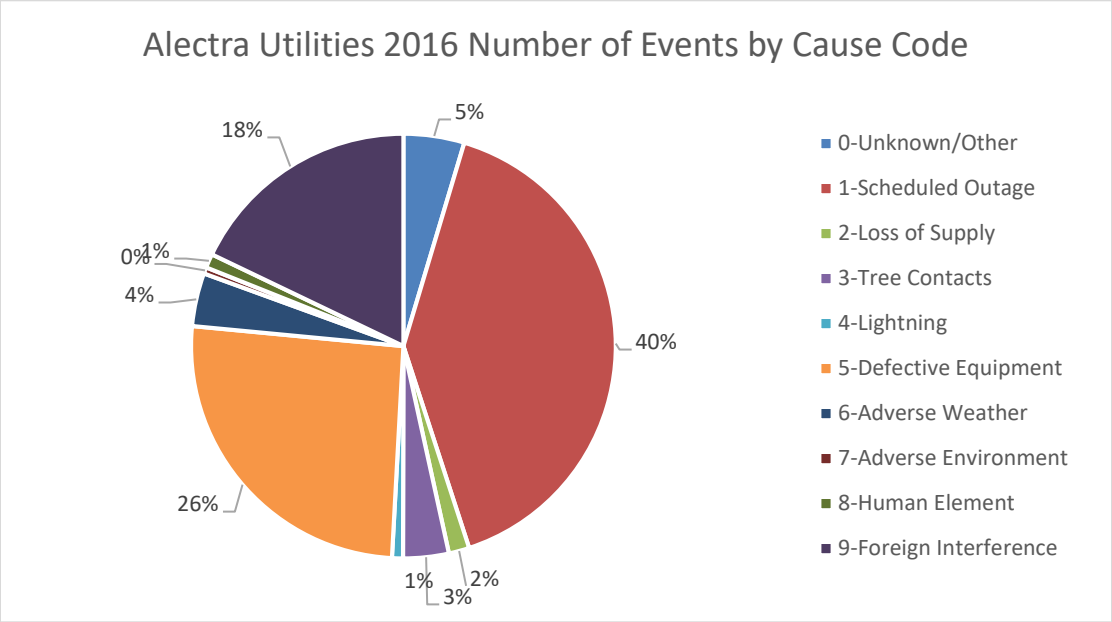


Figure 5 – Alectra Utilities' 2017 Number of Events by Cause Code

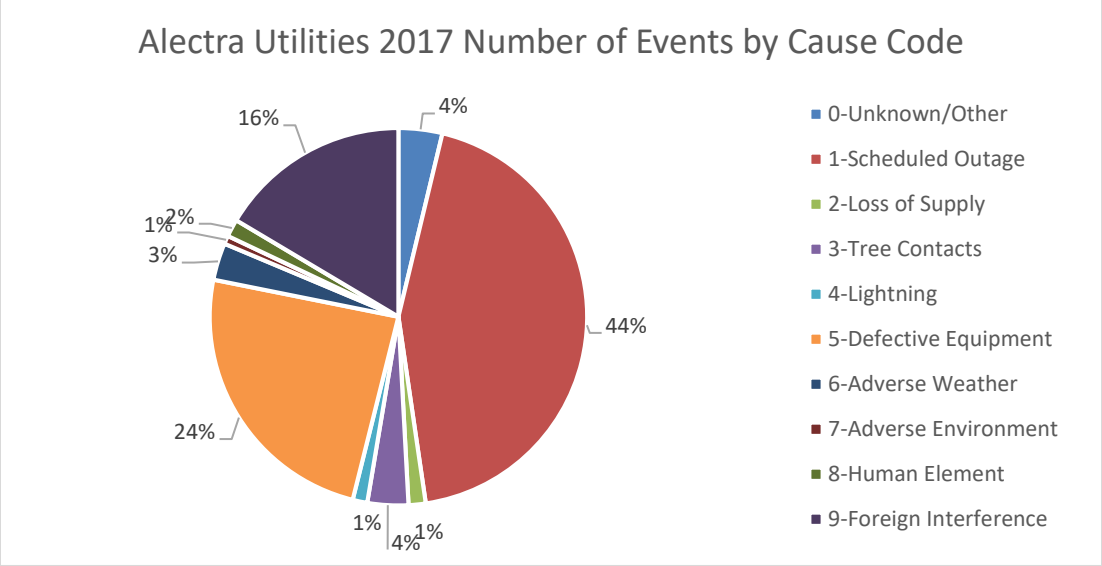
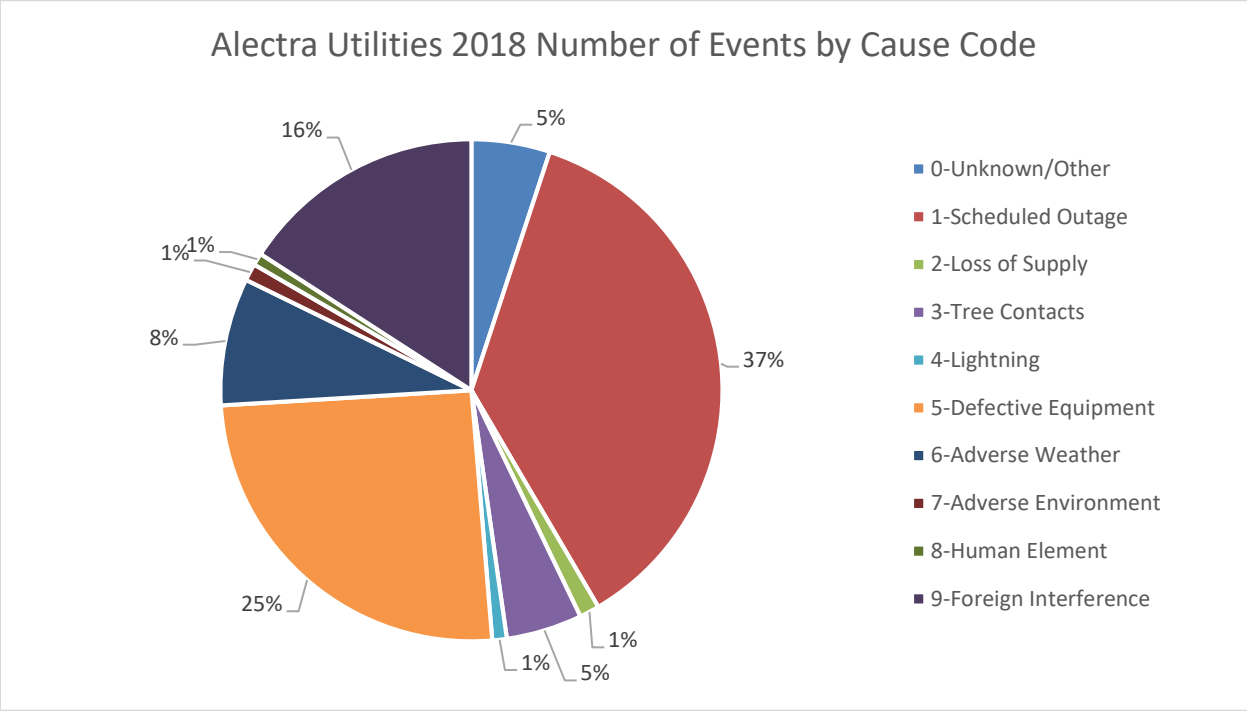


Figure 6 - Alectra Utilities 2018 Number of Events by Cause Code



AMPCO-19

Reference

Exhibit 4, Tab 1, Schedule 1, p. 113

Please discuss if Alectra has changed its methodology of how it records outage events by cause code in the last two years.

Response:

Alectra Utilities confirms that it has not changed the methodology by which it records outage events by cause code in the last two years.

AMPCO-20

Reference

Exhibit 4, Tab 1, Schedule 1, p. 114

a) Please explain how Alectra differentiates between adverse weather and tree contacts to record outage events.

b) Please provide the percentage of tree contact outages that are not weather related.

Response:

a) Alectra Utilities follows the Ontario Energy Board's Electricity Reporting & Record Keeping Requirements ("RRR") for classification of adverse weather and tree contracts. 'Tree Contacts' are classified as "*customer interruptions caused by faults resulting from tree contact with energized circuits".* 'Adverse Weather' is classified as "*Customer Interruptions resulting from rain, ice storms, snow, winds, extreme temperatures, freezing rain, frost, or other extreme weather conditions (exclusive of tree contacts and lightning).*" Please see Alectra Utilities' response to G-Staff-72 for additional information.

b) As explained in response a) above, Alectra Utilities follows the OEB's Electricity Reporting & Record Keeping Requirements ("RRR") which state that adverse weather outages are **exclusive** of tree contacts and lightning. Hence, Alectra Utilities reports all tree contacts (regardless of cause) as a tree contact and does not track if a tree contact was or was not weather related.

AMPCO-21

Reference

Exhibit 4, Tab 1, Schedule 1, p. 112

Alectra indicates that although scheduled outages are necessary for Alectra Utilities to safely and effectively maintain and renew the distribution system equipment, Alectra Utilities has incorporated practices to minimize the duration and inconvenience of customers caused by such outages.

a) Please describe the practices referred to above.

b) Does Alectra track forecast versus actual events and hours of interruption due to Scheduled Outages? If yes, please provide the data for each of the years 2014 to 2018.

Response:

a) Alectra Utilities uses several techniques to minimize the duration and inconvenience to customers caused by scheduled outages. These include: the addition of temporary switches to reduce the impact of an outage; tying an overhead transformer's cables together so a transformer can be replaced without requiring an outage; and in underground situations, preparing the new civil works in advance of the outage. Additionally, careful sequencing of the project may reduce the cutover time between the existing and new assets.

b) Alectra Utilities does not forecast scheduled outages, as the necessary information is not available for each project beforehand, line staff review each job prior to the start of construction. Based on the task and work practices, they validate where isolation is needed and if an outage is required. This is specific to the project, at the time of construction and not known beforehand.

AMPCO-22

Reference

Exhibit 4, Tab 1, Schedule 1, p. 112

Defective Equipment is the leading contributor in both duration and frequency of outages over the last five years.

a) Please provide a breakdown of Defective Equipment events by Cause for each of the years 2014 to 2018.

b) Please provide a breakdown of Defective Equipment hours of interruption by Cause for each of the years 2014 to 2018.

Response:

a) Alectra Utilities provides Table 1 listing the number of Defective Equipment events by cause for each of the years 2014-2018.

Table 1 - Alectra Utilities Defective Equipment Events by Cause (2014-2018)

Causes	2014	2015	2016	2017	2018
Cable & Accessories PILC	16	18	12	11	14
Cable & Accessories XLPE	410	559	541	477	534
Switches	101	97	58	90	90
Switchgear	66	60	53	46	60
OH Line Hardware	209	170	116	137	151
Service	69	62	75	72	76
TX	333	306	321	297	327
TX Cutout	68	79	46	49	40
UG Secondary	10	23	10	5	7
Others	93	82	91	76	60

b) Alectra Utilities provides Table 2 listing the Hours of Interruption due to Defective Equipment events by cause for each of the years 2014-2018.

Table 2 - Alectra Utilities' Defective Equipment Hours of Interruption by Cause (2014-2018)

Causes	2014	2015	2016	2017	2018
Cable & Accessories PILC	34,007	6,805	17,371	30,537	31,111
Cable & Accessories XLPE	174,043	209,621	208,444	190,354	227,553
Switches	14,487	25,881	12,609	27,516	80,240
Switchgear	40,160	34,026	41,451	31,552	58,304
OH Line Hardware	140,071	112,866	39,223	53,235	83,830
Service	1,039	799	1,644	509	497
TX	35,927	27,995	28,401	35,243	35,764
TX Cutout	3,104	10,455	1,426	1,586	1,282
UG Secondary	80	743	170	122	69
Others	12,604	18,483	105,872	16,597	12,549

AMPCO-23

Reference

Exhibit 4, Tab 1, Schedule 1, p. 118, Table 5.2.3-9

a) Please provide the number of hours by year for each of the years 2014 to 2018 due to Defective Equipment.

b) Please provide the number of outage events by year for each of the years 2014 to 2018 due to Defective Equipment.

Response:

a) Alectra Utilities has provided the Hours of Interruption by year for each of the years 2014 to 2018 due to Defective Equipment in Table 1.

Table 1 - Alectra Utilities' Hours of Interruptions by Defective Equipment (2014-2018)

Cause Code	2014	2015	2016	2017	2018
Defective Equipment	455,522	447,675	456,610	387,250	531,199

b) Alectra Utilities has provided the number of outage events each year for 2014 to 2018 due to Defective Equipment in Table 2.

Table 2 - Alectra Utilities' Number of Interruptions by Defective Equipment (2014-2018)

Cause Code	2014	2015	2016	2017	2018
Defective Equipment	1,375	1,456	1,323	1,260	1,359

AMPCO-24

Reference

Exhibit 4, Tab 1, Schedule 1, p. 121, Table 5.2.3-11

Please recast the table with the following adjustments:

a) Separate cable and accessories for PILC cable.

b) Separate cable and accessories for XLPE cable.

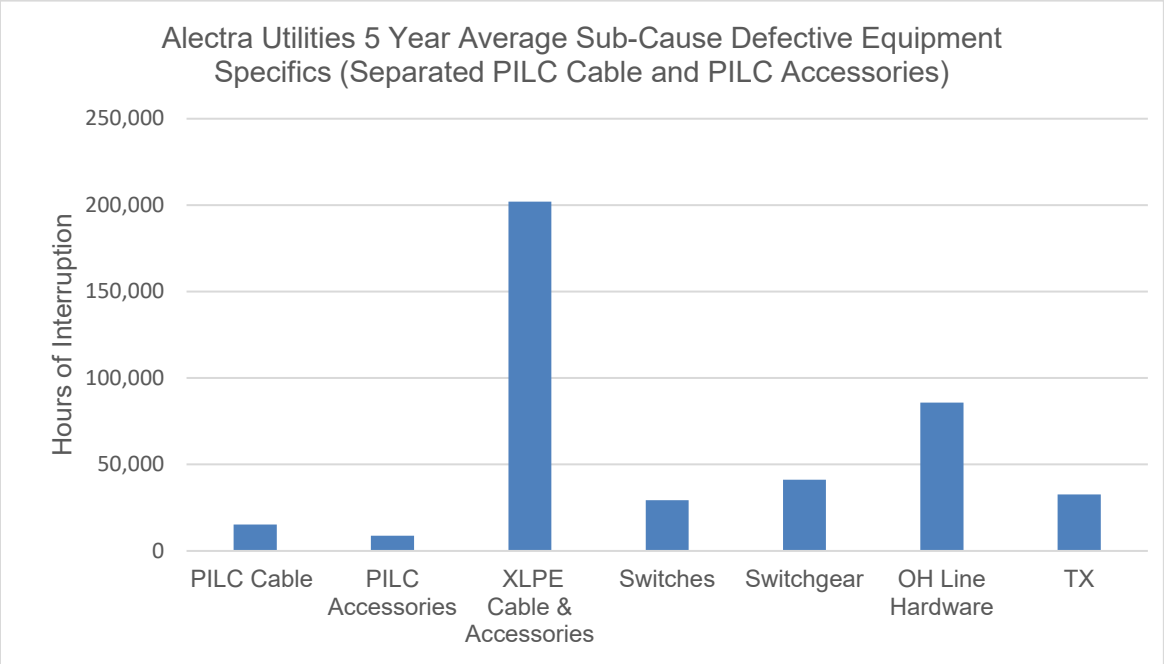
c) Please provide a breakdown of assets under Overhead Line Hardware.

d) Please explain TX.

Response:

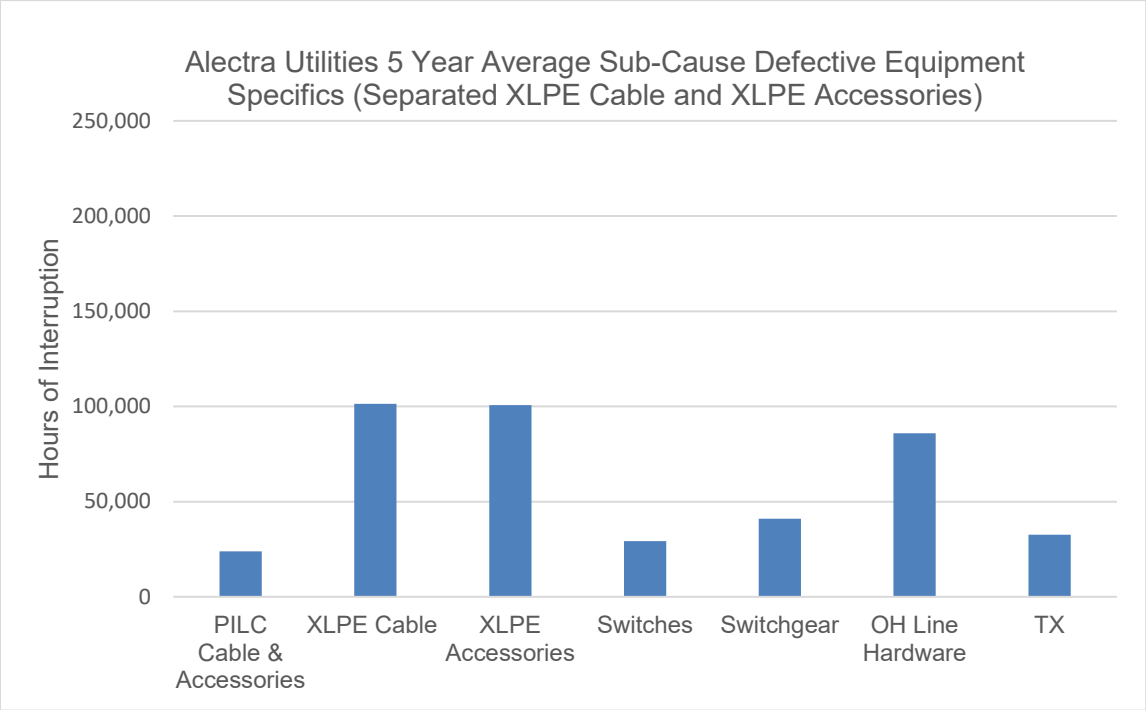
a) Alectra Utilities has separated cable and accessories for PILC cable as show in Figure 1.

Figure 1 - Alectra Utilities' 5 Year (2014-2018) Average Sub-Cause Defective Equipment Specifics by Customer Hours of Interruption Modified to A1unt for PILC cable and PILC Accessories



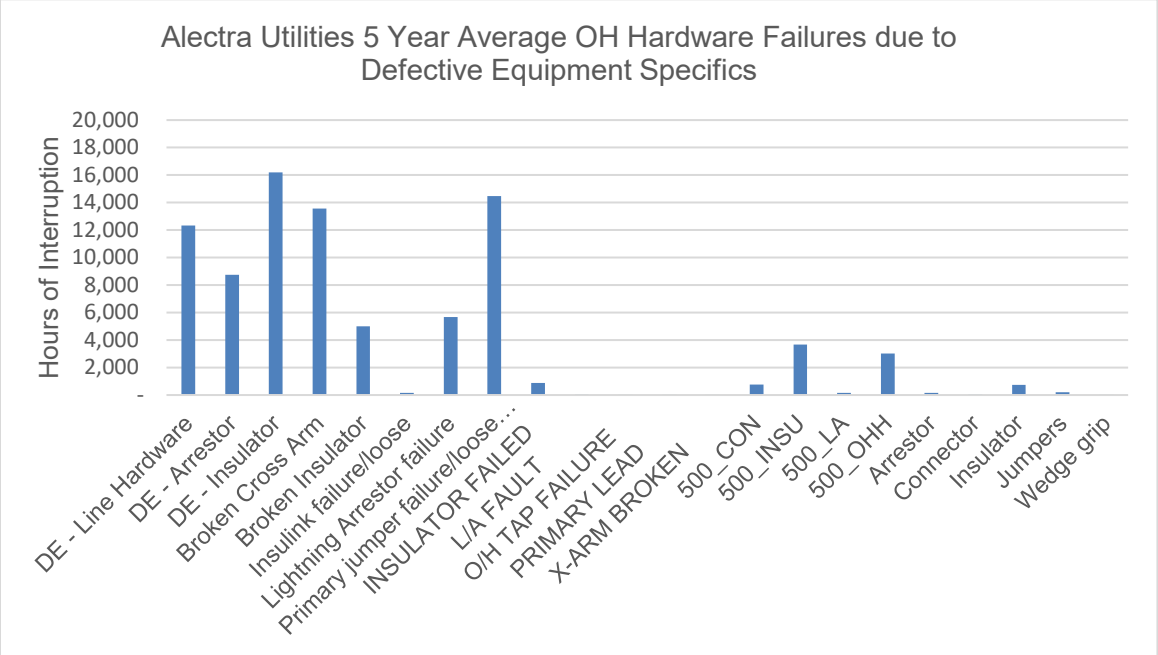
b) Alectra Utilities has separated cable and accessories for XLPE cable as show in Figure 2.

Figure 2 - Alectra Utilities' 5 Year (2014-2018) Average Sub-Cause Defective Equipment Specifics by Customer Hours of Interruption Modified to Account for XLPE cable and XLPE Accessories



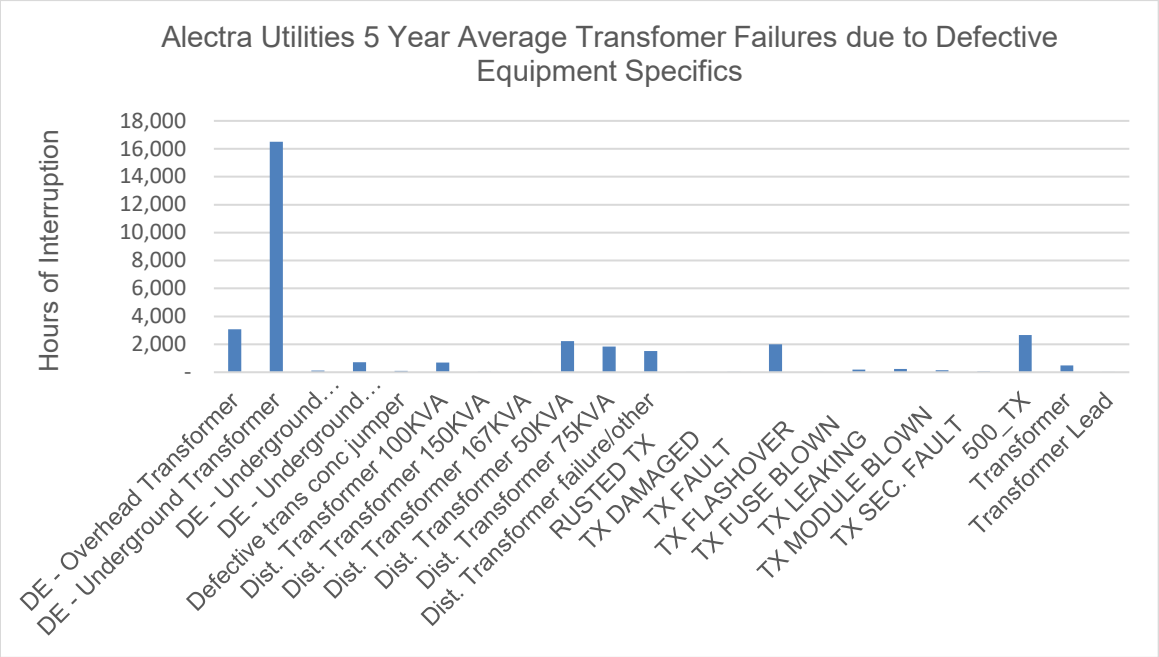
c) Please see Alectra Utilities' response to G-Staff-40 a) for a breakdown of assets under Overhead Line Hardware. The categorization that comprises the data in this group has been provided in Figure 3.

Figure 3 - Alectra Utilities' 5 Year (2014-2018) Average of Defective Equipment - Overhead Hardware Failures Breakdown by Customer Hours of Interruption



d) The sub-category of 'TX' refers to distribution class transformers of all types (Pole, Pad and Vault). The categorization that makes this data has been provided in Figure 4.

Figure 4 - Alectra Utilities' 5 Year (2014-2018) Average of Defective Equipment - Overhead Hardware Failures Breakdown by Customer Hours of Interruption



AMPCO-25

Reference

Exhibit 4, Tab 1, Schedule 1, p. 168

a) Please provide the CPI ratio results for 2014 to 2018.

b) Please provide the SPI ratio results for 2014 to 2018.

Response:

a) and b)

As explained in Section 5.2.3.2 of the DSP (Exhibit 4, Tab 1, Schedule 1, Page 99), Alectra Utilities was formed in 2017 and has expanded significant efforts to integrate, harmonize and establish new processes, practices and systems.

Since many of the proposed performance measures developed to track the implementation of Alectra 2020-2024 DSP are new, Alectra Utilities does not have historical data for these new measures which include the Cost Performance and Schedule Performance Indices.

AMPCO-26

Reference

Exhibit 4, Tab 1, Schedule 1, p. 231, Table 5.3.3-1

a) Please add a column before HI % that shows the population of each asset class.

b) Please add the asset quantities that correspond to the HI percentages for each asset class to the table.

c) Please provide the percentage of total assets included in the ACA.

d) Please provide an excel version of the table that includes (a) and (b).

Response:

a) Alectra Utilities provides the total population of each asset class in Table 1.

Table 1 - Health Index Percentage by Asset Class

Asset Class	Unit measure	Total Population	HI %					Average Age
			VP	P	F	G	VG	
Distribution UG Primary EPR Cables	km	91	0.00	0.00	0.00	0.00	100.00	4
Distribution UG Primary PILC Cables	km	411	2.68	1.46	0.97	2.19	92.70	36
Distribution UG Primary XLPE Cables	km	21,639	11.07	3.51	4.41	6.70	74.30	21
Distribution Concrete Poles	unit	25,340	1.80	3.30	5.43	37.95	51.52	23
Distribution Wood Poles	unit	105,569	4.63	3.47	16.62	38.13	37.15	28
Distribution Overhead Conductors	km	16,400	1.36	0.96	0.48	0.40	96.81	25
Distribution Overhead Switches	unit	3,889	6.56	1.93	1.62	2.39	87.50	19
Distribution Pad-mounted Switchgears	unit	3,389	8.35	8.94	5.05	9.06	68.60	44
Distribution Vault Transformers	unit	13,345	1.35	0.77	21.63	2.78	73.47	27
Distribution Pole-mounted Transformers	unit	32,123	1.57	1.59	5.93	34.64	56.27	20
Distribution Pad-mounted Transformers	unit	79,487	2.12	0.01	13.53	18.54	65.80	17
Stations Switchgear	unit	356	0.00	10.11	22.75	53.37	13.76	21
Stations Circuit Breakers	unit	1,267	4.03	28.02	1.03	19.34	47.59	20
Stations Power Transformers	unit	295	0.00	11.53	0.68	17.97	69.83	25

b) Alectra Utilities provides asset quantities corresponding to the HI percentages for each asset class in the Table 2.

Table 2 - Health Index Quantities by Asset Class

Asset Class	Unit measure	Total Population	HI					Average Age
			VP	P	F	G	VG	
Distribution UG Primary EPR Cables	km	91	0	0	0	0	91	4
Distribution UG Primary PILC Cables	km	411	11	6	4	9	381	36
Distribution UG Primary XLPE Cables	km	21,639	2396	760	955	1450	16078	21
Distribution Concrete Poles	unit	25,340	457	835	1377	9616	13055	23
Distribution Wood Poles	unit	105,569	4883	3664	17546	40252	39224	28
Distribution Overhead Conductors	km	16,400	223	157	78	65	15877	25
Distribution Overhead Switches	unit	3,889	255	75	63	93	3403	19
Distribution Pad-mounted Switchgears	unit	3,389	283	303	171	307	2325	44
Distribution Vault Transformers	unit	13,345	180	103	2886	371	9805	27
Distribution Pole-mounted Transformers	unit	32,123	504	511	1906	11126	18076	20
Distribution Pad-mounted Transformers	unit	79,487	1689	11	10751	14734	52302	17
Stations Switchgear	unit	356	0	36	81	190	49	21
Stations Circuit Breakers	unit	1,267	51	355	13	245	603	20
Stations Power Transformers	unit	295	0	34	2	53	206	25

c) Alectra Utilities' percentage of total assets included in the ACA is 98.4%.

d) Alectra Utilities provides the excel version of the tables from a) and b) as AMPCO-26_Attach 1.

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ATTACH 1

Asset Class	Unit measure	Total Population	HI %					Average Age
			VP	P	F	G	VG	
Distribution UG Primary EPR Cables	km	91	0	0	0	0	100	4
Distribution UG Primary PILC Cables	km	411	2.68	1.46	0.97	2.19	92.70	36
Distribution UG Primary XLPE Cables	km	21,639	11.07	3.51	4.41	6.70	74.30	21
Distribution Concrete Poles	unit	25,340	1.80	3.30	5.43	37.95	51.52	23
Distribution Wood Poles	unit	105,569	4.63	3.47	16.62	38.13	37.15	28
Distribution Overhead Conductors	km	16,400	1.36	0.96	0.48	0.40	96.81	25
Distribution Overhead Switches	unit	3,889	6.56	1.93	1.62	2.39	87.50	19
Distribution Pad-mounted Switchgears	unit	3,389	8.35	8.94	5.05	9.06	68.60	44
Distribution Vault Transformers	unit	13,345	1.35	0.77	21.63	2.78	73.47	27
Distribution Pole-mounted Transformers	unit	32,123	1.57	1.59	5.93	34.64	56.27	20
Distribution Pad-mounted Transformers	unit	79,487	2.12	0.01	13.53	18.54	65.80	17
Stations Switchgear	unit	356	0.00	10.11	22.75	53.37	13.76	21
Stations Circuit Breakers	unit	1,267	4.03	28.02	1.03	19.34	47.59	20
Stations Power Transformers	unit	295	0.00	11.53	0.68	17.97	69.83	25

Asset Class	Unit measure	Total Population	HI Quantity					Average Age
			VP	P	F	G	VG	
Distribution UG Primary EPR Cables	km	91	0	0	0	0	91	4
Distribution UG Primary PILC Cables	km	411	11	6	4	9	381	36
Distribution UG Primary XLPE Cables	km	21,639	2396	760	955	1450	16078	21
Distribution Concrete Poles	unit	25,340	457	835	1377	9616	13055	23
Distribution Wood Poles	unit	105,569	4883	3664	17546	40252	39224	28
Distribution Overhead Conductors	km	16,400	223	157	78	65	15877	25
Distribution Overhead Switches	unit	3,889	255	75	63	93	3403	19
Distribution Pad-mounted Switchgears	unit	3,389	283	303	171	307	2325	44
Distribution Vault Transformers	unit	13,345	180	103	2886	371	9805	27
Distribution Pole-mounted Transformers	unit	32,123	504	511	1906	11126	18076	20
Distribution Pad-mounted Transformers	unit	79,487	1689	11	10751	14734	52302	17
Stations Switchgear	unit	356	0	36	81	190	49	21
Stations Circuit Breakers	unit	1,267	51	355	13	245	603	20
Stations Power Transformers	unit	295	0	34	2	53	206	25

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Reference

Exhibit 4, Tab 1, Schedule 1, p. 353

a) Please provide the total number of candidate projects compared to the final number of projects for 2020 to 2024.

b) Please provide the number of projects not selected for the optimized portfolio that were deferred by the CopperLeaf C55 beyond 2024.

Response:

a) At the start of the portfolio optimization process, Alectra Utilities considered 1,184 distinct capital projects and investments. Based on customer feedback and other adjustments explained in Section 5.2.1 of the DSP (Exhibit 4, Tab 1, Schedule 1, Page 40 and Page 41), Alectra Utilities removed 50 projects. An additional 39 transit projects were removed from the optimization portfolio since capital contributions eliminated the need for capital funding. This portfolio of capital projects also included 137 projects that were determined for execution in 2019, resulting in a net of 958 projects as candidates for the 2020-2024 planning period. Based on outcome of optimization, Alectra Utilities included 884 projects in the DSP planning period of 2020 to 2024.

b) The number of projects not selected for the optimized portfolio that were deferred by CopperLeaf C55 beyond 2024 was 74.

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Reference

Exhibit 4, Tab 1, Schedule 1, p. 358, Table 5.4.2-1

a) Please add Capital Contributions to the Table.

b) Please provide an excel version of the Table.

Response:

a) Alectra Utilities provides Table 1, which is Table 5.4.2-1 including Capital Contributions.

Table 1: Table 5.4.2-1 including Capital Contributions

CATEGORY	2015 Actual			2016 Actual			2017 Actual			2018 Actual			2019 Bridge		
	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Forecast	Var
	$ MM		%	$ MM		%	$ MM		%	$ MM		%	$ MM		%
System Access	97.2	114.1	17.4%	112.2	107.4	-11.0%	115.3	132.6	6.6%	125	134.3	0.2%	121.3	205.1	19.8%
System Renewal	106.3	121.8	14.6%	125.6	118.7	-5.5%	132.3	134.7	1.8%	141.9	124.6	-12.1%	141.7	132.1	-6.7%
System Service	55.8	49.3	-11.6%	46.5	44.3	-4.7%	43.2	42.9	-0.8%	35.6	22.5	-36.7%	39.9	23.5	-41.1%
General Plant	85.8	101.1	17.8%	37.9	21.1	-44.3%	28.5	16	-43.8%	28.2	25	-11.4%	29.3	26.2	-10.9%
TOTAL GROSS	**345.1**	**386.3**	**11.0%**	**322.2**	**291.5**	**-12.0%**	**319.3**	**326.2**	**-2.4%**	**330.7**	**306.4**	**-12.4%**	**332.2**	**386.9**	**-5.9%**
Contributions	(44.0)	(52.1)	11.0%	(49.8)	(51.8)	-12.0%	(55.0)	(68.2)	-2.4%	(61.0)	(70.1)	-12.4%	(56.7)	(127.7)	-5.9%
Total Net	**301.1**	**334.2**	**11.0%**	**272.4**	**239.7**	**-12.0%**	**264.3**	**258.0**	**-2.4%**	**269.7**	**236.3**	**-12.4%**	**275.5**	**259.2**	**-5.9%**

b) Alectra Utilities provides Table 1 in excel AMPCO-28_Attachment 1.

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ATTACHMENT 1

CATEGORY	2015 Actual			2016 Actual			2017 Actual			2018 Actual			2019 Bridge		
	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Forecast	Var
	$ MM		%	$ MM		%	$ MM		%	$ MM		%	$ MM		%
System Access	97.2	114.1	17.4%	112.2	107.4	-11.0%	115.3	132.6	6.6%	125	134.3	0.2%	121.3	205.1	19.8%
System Renewal	106.3	121.8	14.6%	125.6	118.7	-5.5%	132.3	134.7	1.8%	141.9	124.6	-12.1%	141.7	132.1	-6.7%
System Service	55.8	49.3	-11.6%	46.5	44.3	-4.7%	43.2	42.9	-0.8%	35.6	22.5	-36.7%	39.9	23.5	-41.1%
General Plant	85.8	101.1	17.8%	37.9	21.1	-44.3%	28.5	16	-43.8%	28.2	25	-11.4%	29.3	26.2	-10.9%
TOTAL GROSS	**345.1**	**386.3**	**11.0%**	**322.2**	**291.5**	**-12.0%**	**319.3**	**326.2**	**-2.4%**	**330.7**	**306.4**	**-12.4%**	**332.2**	**386.9**	**-5.9%**
Contributions	(44.0)	(52.1)	11.0%	(49.8)	(51.8)	-12.0%	(55.0)	(68.2)	-2.4%	(61.0)	(70.1)	-12.4%	(56.7)	(127.7)	-5.9%
Total Net	**301.1**	**334.2**	**11.0%**	**272.4**	**239.7**	**-12.0%**	**264.3**	**258.0**	**-2.4%**	**269.7**	**236.3**	**-12.4%**	**275.5**	**259.2**	**-5.9%**

AMPCO-29

Reference

Exhibit 4, Tab 1, Schedule 1, p. 370, Table 5.4.2-7 (Appendix 2-AA)

a) Please add capital contributions to Table 5.4.2-7 and provide an excel version of the table.

b) Note 1 at the bottom of the table states "As discussed in this exhibit, historical expenditures information is provided for the sole purpose to comply with the OEB Filing Requirements (i.e. Section 5.4.2 of Chapter 2 of the Filing Requirement) and should not be relied upon.

Please explain why historical expenditures information should not be relied upon.

Response:

a) Alectra Utilities has provided Table 5.4.2-7 including Capital Contributions in Table 1, below. Alectra Utilities provides Table 1 as AMPCO-29_Attachment 1.

1 **Table 1: Table 5.4.2-7 including Capital Contributions**

Project Group	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019	2020	2021	2022	2023	2024
(in $MM)										
SYSTEM ACCESS										
Network Metering	18.1	9.4	12.2	10.8	14.3	14.8	14.3	10.2	11.6	12.2
Customer Connections	73.9	72.5	69.2	59.8	80.8	77.5	82.2	84.5	84.8	87.6
Road Authority & Transit Projects	21.1	25.5	49.4	66.5	108.1	79.3	56.5	57.0	42.1	43.9
Transmitter Related Upgrades	0.0	0.0	0.0	0.0	1.9	1.9	2.2	0.0	0.0	0.0
Total SYSTEM ACCESS	**113.1**	**107.4**	**130.8**	**137.1**	**205.1**	**173.5**	**155.2**	**151.7**	**138.5**	**143.8**
SYSTEM RENEWAL										
Overhead Asset Renewal	33.2	35.1	43.0	39.5	45.4	34.3	34.7	39.4	30.9	37.6
Reactive Capital	16.7	14.6	15.6	20.5	17.2	18.8	19.2	19.6	20.0	20.4
Rear Lot Conversion	4.0	4.6	3.4	0.0	5.1	4.8	1.2	1.2	4.2	8.5
Substation Renewal	9.6	10.6	9.1	10.4	5.0	12.8	4.4	2.8	3.2	5.5
Transformer Renewal	14.7	10.9	11.5	14.0	12.3	5.5	6.3	7.0	7.4	7.8
Underground Asset Renewal	44.3	43.3	51.8	43.6	45.5	61.1	74.5	82.2	88.5	95.5
Other System Renewal	0.0	0.0	1.6	1.5	1.6	1.7	1.7	1.8	1.9	1.9
Total SYSTEM RENEWAL	**122.5**	**119.1**	**136.0**	**129.5**	**132.1**	**139.0**	**142.0**	**154.0**	**156.1**	**177.2**
SYSTEM SERVICE										
SCADA & Automation	4.9	5.3	6.0	4.5	2.8	3.4	3.6	3.7	3.8	4.7
Capacity (Lines)	21.2	18.6	23.8	13.4	8.0	21.1	24.0	23.9	26.4	14.8
Capacity (Stations)	17.0	17.6	10.3	2.4	2.7	3.0	3.0	3.1	7.5	14.3
System Control, Communications & Performance	4.7	1.7	2.9	3.1	5.9	6.6	5.8	4.7	4.1	2.8
Safety & Security	1.2	0.1	1.2	0.9	3.2	5.4	2.0	2.0	2.0	2.0
Distributed Energy Resources (DER) Integration	0.0	0.0	0.0	0.0	0.9	0.7	0.7	0.9	0.9	0.9
Total SYSTEM SERVICE	**49.0**	**43.3**	**44.2**	**24.3**	**23.5**	**40.2**	**39.1**	**38.3**	**44.7**	**39.5**

GENERAL PLANT										
Facilities Management	11.6	4.8	5.2	1.4	3.7	4.2	2.6	2.9	4.6	3.5
Information Technology	24.8	9.2	5.0	4.8	10.2	15.1	18.2	19.8	12.3	8.4
Fleet Renewal	7.5	4.3	3.2	6.7	8.5	8.9	9.5	9.9	10.3	10.2
Connection and Cost Recovery Agreements	54.8	0.4	0.0	6.8	1.0	8.7	1.6	0.0	0.5	0.0
Sub-Total Material Projects	98.7	18.7	13.4	19.7	23.4	36.9	31.9	32.6	27.7	22.1
Miscellaneous Projects (under materiality threshold)	2.6	2.1	4.7	3.3	2.8	2.5	2.5	2.5	2.5	2.6
Total GENERAL PLANT	**101.3**	**20.8**	**18.1**	**23.0**	**26.2**	**39.4**	**34.4**	**35.1**	**30.2**	**24.7**
Total Gross Capital	**385.9**	**290.6**	**329.1**	**313.9**	**386.9**	**392.1**	**370.8**	**379.1**	**369.5**	**385.2**
Contributions - System Access	**(52.1)**	**(51.8)**	**(68.2)**	**(70.1)**	**(127.7)**	**(107.0)**	**(88.3)**	**(88.5)**	**(71.4)**	**(73.6)**
Contributions - System Service	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**(2.2)**	**(2.2)**	**(2.3)**	**(2.3)**	**(2.3)**
Total Contributions	**(52.1)**	**(51.8)**	**(68.2)**	**(70.1)**	**(127.7)**	**(109.2)**	**(90.5)**	**(90.8)**	**(73.7)**	**(75.9)**
Total Net Capital	**333.8**	**238.8**	**260.9**	**243.8**	**259.2**	**282.9**	**280.2**	**288.3**	**295.8**	**309.3**

b) Please refer to the explanation regarding the use of historical figures in providing an appropriate basis for comparison by referencing the footnote on Page 19 of the DSP (Exhibit 4, Tab 1, Schedule 1, page 19).

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ATTACHMENT 1

Table 2AA Pasted without rounding for Word Table purposes - AFTER CABLE

Project Group	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019	2020	2021	2022	2023	2024
MIFRS										
SYSTEM ACCESS										
Network Metering	18.1	9.4	12.2	10.8	14.3	14.8	14.3	10.2	11.6	12.2
Customer Connections	73.9	72.5	69.2	59.8	80.8	77.5	82.2	84.5	84.8	87.6
Road Authority & Transit Projects	21.1	25.5	49.4	66.5	108.1	79.3	56.5	57.0	42.1	43.9
Transmitter Related Upgrades	0.0	0.0	0.0	0.0	1.9	1.9	2.2	0.0	0.0	0.0
Total SYSTEM ACCESS	**113.1**	**107.4**	**130.8**	**137.1**	**205.1**	**173.5**	**155.2**	**151.7**	**138.5**	**143.8**
SYSTEM RENEWAL										
Overhead Asset Renewal	33.2	35.1	43.0	39.5	45.4	34.3	34.7	39.4	30.9	37.6
Reactive Capital	16.7	14.6	15.6	20.5	17.2	18.8	19.2	19.6	20.0	20.4
Rear Lot Conversion	4.0	4.6	3.4	0.0	5.1	4.8	1.2	1.2	4.2	8.5
Substation Renewal	9.6	10.6	9.1	10.4	5.0	12.8	4.4	2.8	3.2	5.5
Transformer Renewal	14.7	10.9	11.5	14.0	12.3	5.5	6.3	7.0	7.4	7.8
Underground Asset Renewal	44.3	43.3	51.8	43.6	45.5	61.1	74.5	82.2	88.5	95.5
Other System Renewal	0.0	0.0	1.6	1.5	1.6	1.7	1.7	1.8	1.9	1.9
Total SYSTEM RENEWAL	**122.5**	**119.1**	**136.0**	**129.5**	**132.1**	**139.0**	**142.0**	**154.0**	**156.1**	**177.2**
SYSTEM SERVICE										
SCADA & Automation	4.9	5.3	6.0	4.5	2.8	3.4	3.6	3.7	3.8	4.7
Capacity (Lines)	21.2	18.6	23.8	13.4	8.0	21.1	24.0	23.9	26.4	14.8
Capacity (Stations)	17.0	17.6	10.3	2.4	2.7	3.0	3.0	3.1	7.5	14.3
System Control, Communications & F	4.7	1.7	2.9	3.1	5.9	6.6	5.8	4.7	4.1	2.8
Safety & Security	1.2	0.1	1.2	0.9	3.2	5.4	2.0	2.0	2.0	2.0
Distributed Energy Resources (DER)	0.0	0.0	0.0	0.0	0.9	0.7	0.7	0.9	0.9	0.9
Total SYSTEM SERVICE	**49.0**	**43.3**	**44.2**	**24.3**	**23.5**	**40.2**	**39.1**	**38.3**	**44.7**	**39.5**
GENERAL PLANT										
Facilities Management	11.6	4.8	5.2	1.4	3.7	4.2	2.6	2.9	4.6	3.5
Information Technology	24.8	9.2	5.0	4.8	10.2	15.1	18.2	19.8	12.3	8.4
Fleet Renewal	7.5	4.3	3.2	6.7	8.5	8.9	9.5	9.9	10.3	10.2
Connection and Cost Recovery Agree	54.8	0.4	0.0	6.8	1.0	8.7	1.6	0.0	0.5	0.0
Sub-Total Material Projects	98.7	18.7	13.4	19.7	23.4	36.9	31.9	32.6	27.7	22.1
Miscellaneous Projects (under materi	2.6	2.1	4.7	3.3	2.8	2.5	2.5	2.5	2.5	2.6
Total GENERAL PLANT	**101.3**	**20.8**	**18.1**	**23.0**	**26.2**	**39.4**	**34.4**	**35.1**	**30.2**	**24.7**
Total Gross Capital	**385.9**	**290.6**	**329.1**	**313.9**	**386.9**	**392.1**	**370.8**	**379.1**	**369.5**	**385.2**
Contributions - System Access	**(52.1)**	**(51.8)**	**(68.2)**	**(70.1)**	**(127.7)**	**(107.0)**	**(88.3)**	**(88.5)**	**(71.4)**	**(73.6)**
Contributions - System Service	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**(2.2)**	**(2.2)**	**(2.3)**	**(2.3)**	**(2.3)**
Total Contributions	**(52.1)**	**(51.8)**	**(68.2)**	**(70.1)**	**(127.7)**	**(109.2)**	**(90.5)**	**(90.8)**	**(73.7)**	**(75.9)**
Total Net Capital	**333.8**	**238.8**	**260.9**	**243.8**	**259.2**	**282.9**	**280.2**	**288.3**	**295.8**	**309.3**

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Reference

Exhibit 4, Tab 1, Schedule 1, Table 5.4.3-5, p. 402 & p. 175

a) Please provide a breakdown of the investments in Table 5.4.3 – 5 by operating area (P175).

b) Please provide a breakdown of the investments in Table 5.4.3 -5 by operating area for the years 2015 to 2019.

Response:

a) In Table 1 below, Alectra Utilities has provided Table 5.4.3-5 by operating area.

Table 1 - Table 5.4.3-5 by Operating Area

Table 5.4.3-5 by Operating Area	2020	2021	2022	2023	2024
Central North	**$17.4**	**$15.8**	**$19.1**	**$19.8**	**$19.1**
Overhead Asset Renewal	$6.1	$5.6	$8.1	$7.6	$5.3
Reactive Capital	$1.5	$1.6	$1.6	$1.6	$1.7
Substation Renewal	$3.7	$0.8	$0.7	$0.7	$0.9
Transformer Renewal	$0.6	$0.8	$1.0	$1.3	$1.5
Underground Asset Renewal	$5.5	$7.0	$7.7	$8.6	$9.8
Central South	**$37.6**	**$39.8**	**$42.4**	**$45.3**	**$51.8**
Overhead Asset Renewal	$5.9	$5.3	$4.9	$4.6	$7.3
Reactive Capital	$3.4	$3.5	$3.6	$3.6	$3.7
Substation Renewal	$5.1	$0.5	$0.5	$0.9	$3.0
Transformer Renewal	$1.9	$1.9	$1.9	$2.0	$2.0
Underground Asset Renewal	$21.3	$28.7	$31.5	$34.2	$35.8
Guelph	**$6.1**	**$6.3**	**$6.5**	**$6.6**	**$6.8**
Overhead Asset Renewal	$2.0	$2.1	$2.1	$2.1	$2.3
Reactive Capital	$1.0	$1.0	$1.0	$1.1	$1.1
Rear Lot Conversion	$0.1	$0.1	$0.1	$0.1	$0.1
Substation Renewal	$0.1	$0.1	$0.1	$0.1	$0.1
Transformer Renewal	$0.3	$0.3	$0.4	$0.4	$0.4
Underground Asset Renewal	$2.6	$2.6	$2.8	$2.8	$2.9
West	**$25.7**	**$27.9**	**$30.4**	**$23.4**	**$33.5**
Overhead Asset Renewal	$10.9	$12.0	$14.2	$4.5	$11.9
Reactive Capital	$3.4	$3.5	$3.6	$3.7	$3.8
Rear Lot Conversion	$0.0	$0.0	$0.0	$2.3	$4.1
Substation Renewal	$0.5	$0.5	$0.4	$0.5	$0.6
Transformer Renewal	$0.6	$0.7	$0.7	$0.7	$0.7
Underground Asset Renewal	$8.6	$9.5	$9.8	$9.8	$10.6
Other System Renewal	$1.7	$1.7	$1.8	$1.9	$1.9
East	**$52.1**	**$52.2**	**$55.6**	**$61.0**	**$65.9**
Overhead Asset Renewal	$9.4	$9.7	$10.1	$12.0	$10.8
Reactive Capital	$9.4	$9.6	$9.8	$10.0	$10.1
Rear Lot Conversion	$4.7	$1.0	$1.1	$1.8	$4.3
Substation Renewal	$3.3	$2.5	$1.1	$1.0	$1.0
Transformer Renewal	$2.2	$2.6	$3.0	$3.1	$3.3
Underground Asset Renewal	$23.0	$26.7	$30.5	$33.1	$36.5
Grand Total	**$139.0**	**$142.0**	**$154.0**	**$156.1**	**$177.2**

b) In Table 2 below, Alectra Utilities provides the breakdown of the investments in Table 5.4.3-5 by operating area for the years 2015-2019.

Table 2 - Breakdown of the Investments in Table 5.4.3-5 by Operating Area for 2015-2019

Table 5.4.3-5 by Operating Area	2015	2016	2017	2018	2019
Central North	**$9.8**	**$7.2**	**$11.9**	**$13.6**	**$15.1**
Overhead Asset Renewal	$4.4	$1.5	$3.5	$3.8	$7.2
Reactive Capital	$1.6	$1.8	$1.9	$3.2	$1.5
Substation Renewal	$0.3	$2.3	$0.8	$1.2	$1.2
Transformer Replacements	$0.4	$0.2	$0.8	$0.8	$0.4
Underground Asset Renewal	$3.1	$1.4	$4.9	$4.4	$4.9
Central South	**$44.7**	**$40.4**	**$43.9**	**$41.6**	**$37.9**
Overhead Asset Renewal	$8.1	$10.5	$9.2	$8.4	$10.0
Reactive Capital	$0.3	$0.3	$0.4	$0.2	$3.2
Substation Renewal	$7.2	$5.2	$5.7	$5.4	$1.2
Transformer Replacements	$12.2	$8.5	$8.5	$11.4	$9.3
Underground Asset Renewal	$16.9	$15.9	$20.1	$16.1	$14.1
Guelph	**$3.3**	**$6.2**	**$7.5**	**$4.8**	**$6.0**
Overhead Asset Renewal	$1.5	$2.2	$2.6	$2.8	$1.9
Reactive Capital	$0.1	$0.2	$0.2	$0.5	$1.1
Rear Lot Conversion	$0.0	$0.0	$0.0	$0.1	$0.1
Substation Renewal	$0.0	$0.0	$0.0	$0.2	$0.1
Transformer Replacements	$0.3	$0.4	$0.5	$0.5	$0.3
Underground Asset Renewal	$1.3	$3.5	$4.1	$0.8	$2.5
Other System Renewal	$0.0	$0.0	$0.0	$0.0	$0.0
West	**$17.4**	**$23.0**	**$33.3**	**$31.6**	**$35.1**
Overhead Asset Renewal	$10.8	$10.6	$18.2	$17.2	$17.6
Reactive Capital	$3.4	$3.9	$3.7	$5.4	$2.3
Rear Lot Conversion	$0.7	$1.8	$0.3	$0.0	$4.2
Substation Renewal	$0.0	$0.2	$0.4	$0.4	$0.8
Transformer Replacements	$0.2	$0.3	$0.3	$0.2	$0.4
Underground Asset Renewal	$2.2	$6.1	$8.7	$6.9	$8.1
Other System Renewal	$0.0	$0.0	$1.6	$1.5	$1.6
East	**$47.4**	**$42.2**	**$39.4**	**$38.1**	**$38.1**
Overhead Asset Renewal	$8.4	$10.2	$9.4	$7.2	$8.8
Reactive Capital	$11.2	$8.4	$9.4	$11.3	$9.1
Rear Lot Conversion	$3.3	$2.8	$3.1	$0.0	$0.8
Substation Renewal	$2.0	$2.8	$2.3	$3.2	$1.8
Transformer Replacements	$1.6	$1.5	$1.3	$1.1	$1.9
Underground Asset Renewal	$20.8	$16.4	$13.9	$15.4	$15.8
Grand Total	**$122.5**	**$119.1**	**$136.0**	**$129.5**	**$132.1**

AMPCO-31

Reference

Exhibit 4

a) Please provide Alectra's total asset population at the end of 2018.

b) Please provide the % of total assets to be replaced over the period 2020 to 2024 compared to the period 2015 to 2018.

Response:

a) At the end of 2018, Alectra Utilities' total asset population was 303,600 units. Alectra Utilities provides the count with each kilometer of linear assets (conductors and cables) equivalent to one unit.

b) Alectra Utilities interprets the question to provide asset quantities by year for asset renewal investments; therefore, it does not consider replacements due to road widening widenings, voltage conversion, rear lot conversion, or other customer requests.

Alectra Utilities cannot predict the future asset population. Therefore, it has used the 2018-year end asset count for each year from 2020 to 2024. Further, Alectra Utilities does not have the asset population quantities for all operational areas for each historic year. Therefore, it has used the 2018-year end asset count for each asset class for 2015-2019. The percentage of total assets replaced from 2015-2018 relative to their population size (at 2018-year end) is provided in Table 1 - Transformer Replacements include the multi-year project to replace transformers indicating signs of leaking oil or oil containing PCBs in the ERZ.

Table 1 - Asset Renewal Quantities and Percentage of Population Replaced (2015-2024)

Asset Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Wood poles	1.1%	1.1%	1.1%	1.1%	0.9%	0.8%	0.9%	0.9%	0.8%	0.8%
Switches	2.6%	2.9%	2.6%	2.0%	1.3%	1.1%	1.1%	1.1%	1.1%	1.1%
Switchgear	2.4%	3.0%	2.7%	1.4%	2.4%	2.4%	2.4%	2.4%	2.4%	2.4%
TX Replacement	0.7%	0.8%	0.8%	0.7%	0.8%	0.4%	0.4%	0.5%	0.5%	0.5%
Cable Renewal (Injection and Replacement)	0.8%	0.6%	0.6%	0.6%	1.0%	1.4%	1.8%	2.0%	2.2%	2.4%

AMPCO-32

Reference

Exhibit 4, Tab 1, Schedule 1, Appendix A05, p. 7

a) Please provide the number of poles reinforced for each of the years 2015 to 2018 and forecast for 2019 to 2024 and the corresponding cost per year.

b) Please provide the number of poles replaced for each of the years 2015 to 2018 and forecast for 2019 to 2024 and the corresponding cost per year.

Response:

a) The number of poles reinforced for each of the years 2015 to 2018 and forecast for 2019 to 2024 and the corresponding cost per year are shown in Table 1, below. These statistics are specific to the pole replacement investment, and not related to pole replacements as a result of other investments, such as voltage conversion or road widening.

Table AMPCO-32-1 – Pole Reinforcement from 2015 to 2024

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Pole Reinforcement Quantity	12	1	0	5	4	4	4	4	4	4
Pole Reinforcement Cost ($000)	$41.6	$3.7	0	$19.8	$14.9	$14.9	$14.9	$14.9	$14.9	$14.9

b) The number of poles replaced for each of the years 2015 to 2018 and forecast for 2019 to 2024 and the corresponding cost per year is provided in Table 2. As identified above, the 2019-2024 numbers are specific to the pole replacement investment, and not related to other pole replacements as a result of voltage conversion or road widening, for instance.

For historical values from 2015-2018, variation in the values is a result of the different historical practice at the predecessor utilities. For example, some of the replacement events may be emergency replacements; Alectra Utilities now categorizes these as reactive expenditures.

Table AMPCO 2 – Pole Replacement from 2015 to 2024

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Pole Replacement Quantity	1132	1162	1126	1125	908	864	925	903	886	864
Pole Replacement Cost($MM)	$16.2	$20.1	$17.6	$17.1	$17.2	$13.8	$15.3	$16.2	$16.6	$16.7

The sum of the above Tables 1 and Table 2 reconcile to the total of pole renewal investment on "Table A05 – 3: Pole renewal investment Summary" provided below (Reference: EB-2010-0018 Exhibit 04, Tab 01 Schedule, 01 Appendix A05 – Overhead Asset Renewal, Page 8 of 53). The numbers in Table A05 include both pole reinforcement and pole replacement.

Table A05 - 3: Pole renewal investment Summary

	Historical Spending				Bridge	Forecast Spending				
Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
CAPEX ($MM)	$16.2	$20.1	$17.6	$17.1	$17.2	$13.8	$15.3	$16.2	$16.6	$16.7
Primary Driver:	Failure Risk									
Secondary Drivers:	Reliability, Safety, Resilience to Adverse Weather									
Outcomes:	Improved Reliability, Improved Safety, Storm Resilience									

AMPCO-33

Reference

Exhibit 4, Tab 1, Schedule 1, Appendix A06, p. 4

a) Page 4: Please provide the number of deficiencies for each of the years 2014 to 2018.

b) Page 10: Please provide the volume of work for each of the years 2014 to 2019.

c) Please provide the Reactive Capital costs to date in 2019.

Response:

a) and b) Alectra Utilities does not have data in a manner that it can report to respond to these questions.

c) Reactive Capital expenditures to date as of June 30, 2019 are $11.5MM.

AMPCO-34

Reference

Exhibit 4, Tab 1, Schedule 1, Appendix A08

Please provide the total number of substation renewals for each of the years 2015 to 2018.

Response:

Alectra Utilities interprets this question as a request for the number of renewal initiatives by sub-station renewals where extensive rebuilds were completed. Major substation renewal initiatives include replacement or refurbishment of power transformers, station switchgear and/or circuit breakers. Where substation renewals may have been phased over multiple years, Alectra Utilities has reported the renewal in the year in which there was the most significant capital expenditure. The provided renewals exclude replacement or repair of minor assets, such as fences and switches.

The number of major substation renewal initiatives for each of years 2015 to 2018 is provided in Table 1, below.

Table 1 – Number of Substation Renewal Initiatives from 2015 to 2018

2015	2016	2017	2018
7	7	6	5

AMPCO-35

Reference

Exhibit 4, Tab 1, Schedule 1, Appendix A10

a) Page 12 Figure A10-5: Please provide the numerical values for each year. Please confirm what data is excluded from outage data (i.e. Major Event Days).

b) Page 12 Figure A10-6: Please provide the numerical values for each year. Please confirm what is excluded from customer interruption data (i.e. Major Event Days).

c) Please explain the increase in outages and Hours of Interruption in 2018.

Response:

a) Alectra Utilities has provided the number of XLPE and XLPE accessories failures per year (2014-2018) in Table 1. This data has no exclusions.

Table 1 - Number of XLPE and XLPE Accessories Failures per Year (2014-2018) (no exclusions)

Sub Causes	2014	2015	2016	2017	2018
Number of XLPE and XLPE Accessories Failures	410	559	541	477	534

b) Alectra Utilities has provided the customer hours of interruption due to XLPE and XLPE accessories failures per year (2014-2018) in Table 2. This data has no exclusions.

Table 2 - Customer Hours of Interruption due to XLPE and XLPE Accessories Failure per Year (2014-2018) (no exclusions)

Sub Causes	2014	2015	2016	2017	2018
Customer Hours of Interruption due to XLPE and XLPE Accessories	174,043	209,621	208,444	190,354	227,553

c) In 2018, Alectra Utilities not only experienced more cable failures than in 2017, but it also experienced double cable faults or multiple failure events. Double cable fault events occur when both the primary supply in the loop and the alternative supply in the loop both fail. Multiple failure events are situations where the cable fails and also a transformer or elbow fails. The second outage may not be discovered until restoration from the first failure is

underway, causing the multiple event. These types of outage events create additional events and result in abnormally long outage durations.

AMPCO-36

Reference

Exhibit 4, Tab 1, Schedule 1, Appendix A19

Please discuss how Alectra took into account vehicle utilization rates in right sizing the fleet and investment levels for the test period.

Response:

Based on Alectra Utilities' condition and replacement criteria as outlined in Exhibit 4, Tab 1, Schedule 1, Appendix A19, page 5, Table A19 – 4, Vehicle Renewal Assessment Criteria, it found that its required fleet capital expenditures should be $63.1MM over the Distribution System Plan "DSP" period, as outlined in Exhibit 4, Tab 1, Schedule 1, Appendix A19, page 19, Table A19 – 15, Vehicle Replacement vs. Proposed DSP Expenditures.

However, Alectra Utilities has reduced this budget by $13.2MM to $48.8MM over the DSP period, to minimize the impact to the ratepayers.

In order to achieve that reduction, Alectra Utilities will be replacing vehicles manufactured in 2010 or earlier. It also considered utilization rates. Further, it will be reviewing the recommendations to be provided by Mercury Associates in their upcoming utilization study, in order to reduce the fleet capital expenditures, as required during the DSP period. This Utilization Study, which is expected to be completed in Q4, 2019, will further inform Alectra Utilities fleet investment decisions.

AMPCO-37

Reference

Exhibit 4, Appendix D, p. 10

Alectra indicates it consolidated and harmonized the ACA for the legacy utilities.

Please summarize any significant changes to the ACA methodology compared to the ACA methodologies of the legacy utilities and the resulting impact on the results.

Response:

Please see response to Alectra Utilities' response to G-Staff-65.

AMPCO-38

Reference

Exhibit 4, Appendix D, p. 15

Alectra indicates age is represented as a percentage score based on a continuous function given by the Gompertz-Makeham Model described by a set of equations, where the constants are calculated so as to yield an age score of 80% at the Typical Useful Life (TUL) and 1% at the End of Useful Life (EUL) of an asset. Use of the Gompertz-Makeham Model is a widely accepted industry practice for assessing asset condition.

a) Please discuss if representing age as a percentage score and using the Gompertz-Makeham Model was used by any of the legacy utilities. If yes, please discuss if the same constants described above were used.

b) Are the age scores of 80% at the TUL and 1% at the EUL of an asset set by the Gompertz-Makeham Model or Alectra?

Response:

a) The Gompertz-Makeham model had been used to represent age as a percentage score by all of Alectra Utilities' predecessors, with the exception of PowerStream. Legacy PowerStream incorporated an economic lifecycle representation, which is equivalent to continuous function model applied by the other four predecessor utilities.

The inputs into the model varied among the utilities, based on the requirements and asset demographics of predecessors. As examples, Alectra Utilities provides summary tables for wood poles, pad-mount transformers and underground cables in Tables 1, 2 and 3, respectively.

Alectra Utilities harmonized the parameters in the Gompertz-Makeham model for all its assets by selecting communal values for the parameters as shown in the tables, below. Alectra Utilities' harmonized Health Index models from the 2018 ACA place a higher emphasis on condition-factors and a lower emphasis on age.

Table 1 – Gompertz-Makeham Model Parameters for the Wood Pole

Utility	Age score and TUL (years)	Age score and EUL (years)	Weight in Health Index formula
Legacy Brampton Hydro	40 years at 80%	65 years at 1%	44%
Legacy Enersource	45 years at 80%	65 years at 1%	30%
Legacy Horizon Utilities	50 years at 80%	65 years at 20%	13%
Alectra Utilities	45 yeas at 80%	75 years at 1%	15%

Table 2 – Gompertz-Makeham Model Parameters for Pad-mounted Transformer

Utility	Age score and TUL (years)	Age score and EUL (years)	Weight in Health Index formula
Legacy Brampton Hydro	35 years at 80%	45 years at 5%	13%
Legacy Enersource	35 years at 80%	45 years at 1%	16%
Legacy Horizon Utilities	40 years at 80%	55 years at 1%	67%
Alectra Utilities	40 years at 80%	45 years at 1%	12%

Table AMPCO-38-3 – Gompertz-Makeham model parameters for XLPE Underground Cable

Utility	Age score and TUL (years)	Age score and EUL (years)	Weight in Health Index formula
Legacy Brampton Hydro	30 Years at 80%	35 years at 5%	100%
Legacy Enersource	20 years at 80%	40 years at 1%	100%
Legacy Horizon Utilities	30 years at 80%	40 years at 1%	100%
Alectra Utilities (Non Tree-Retardant)	30 years at 80%	40 years at 1%	100%

b) The parameters of the model are set by Alectra Utilities as shown in Tables 1-3. As discussed in Alectra Utilities' response to part a), Alectra Utilities' Health Index models have a higher emphasis on condition-parameters and lower emphasis on age.

AMPCO-39

Reference

Exhibit 4, Appendix D, p. 18

For each asset class, the average DAI is presented as part of the Health Index results section. DAI is used by SMEs when evaluating the completeness of, and confidence in the HI results (relative to the HI model inputs) and applicable sustainment strategies. As Alectra harmonizes its inspection, maintenance, testing and data collection practices, it is expected that the DAI will increase in the future.

Please provide the DAI threshold level where completeness of HI results would be a concern to SMEs.

Response:

Alectra Utilities' measure for data completeness is a DAI of 50%.

The DAI threshold level where the completeness of HI results would be of concern is dependent on the asset class under consideration. Alectra Utilities' SMEs are informed of the model used for each asset class condition assessment. This includes awareness of asset attributes, criteria, weights, DAI and condition multipliers used to determine the health index of an asset.

In addition to health index results, Alectra Utilities' SMEs use all the available information to make informed decisions.

Please see Section 5.3.3.2 of the DSP (Exhibit 4, Tab 1, Schedule 1, pages 231-235) for a summary of asset replacement strategies that Alectra Utilities employs in considering asset lifecycle optimization and system renewal needs.

AMPCO-40

Reference
Exhibit 4, Appendix D, p. 50

Alectra indicates the average DAI for wood poles is 68.7%.

a) Please explain how the average DAI for wood poles is derived and provide the calculation.

b) Please provide the data needed to be collected to take the DAI for wood poles to 100%.

Response:

a) Alectra Utilities considers the Data Availability Index ("DAI") as a measure of data completeness in asset condition assessments. DAI is formulated by a weighted summation function, as described in Exhibit 4, Appendix D, Page 18. The DAI formula multiplies the index availability of each input by its associated Health Index input weight. Next, the calculation sums all input availability components to provide a total DAI for each asset.

As an example, Alectra Utilities provides the calculation of an individual pole DAI, below.

DAI Calculation for a Wood Pole

$$DAI\ of\ a\ wood\ pole\ (\%) =$$
$$(\text{Pole Strength Weight} \times \text{Data Available}) +$$
$$(\text{Field Inspection Weight} \times \text{Data Available}) +$$
$$(\text{Age} * \text{Data Available})$$

Please refer to Table 14 in Exhibit 4, Appendix D, Page 48, for wood poles' health index parameters and weights.

Table 1 provides an example for the calculation of Average DAI for five wood poles.

Table 1 - Example of Wood Pole DAI Calculations

Asset #		Pole Strength (49%)	Field Inspection (36%)	Age (15%)	DAI
Pole#_1		Available (1)	Available (1)	Available (1)	100%
Pole#_2		Available (1)	Available (1)	Available (1)	100%
Pole#_3		Not Available (0)	Not Available (1)	Available (1)	51%
Pole#_4		Not Available (0)	Available (1)	Available (1)	51%
Pole#_5		Available (1)	Not Available (1)	Available (1)	100%
	Average DAI				80.4%

b) In order to achieve a 100% DAI, every wood pole would have to be Resistograph tested, field inspected, and have the pole age known. Due to dependency on pole strength, it may not be feasible for Alectra Utilities to achieve an average DAI of 100% for wood poles. Alectra Utilities only performs the Resistograph testing on poles older than 7 years old. As a result, a portion of the wood pole population (i.e., those younger than 10 years due to a three year inspection cycle) will not have 100% DAI. Consequently, the average DAI of Alectra Utilities' wood pole population will not be 100%.

AMPCO-41

Reference

Exhibit 4, Appendix D, p. 50

Alectra indicates the average DAI for Power Transformers is 77%.

Please provide the data needed to be collected to take the DAI for Power Transformers to 100%.

Response:

In order for Alectra Utilities to achieve 100% DAI for power transformers, every power transformer would require a fully completed condition surveys, oil analysis test results for all required factors, and known age. It is not practical, nor is it prudent, for Alectra Utilities to achieve an average DAI of 100% for power transformers since Alectra does not complete full and ongoing tests on newer transformers.

Alectra Utilities does not conduct ongoing testing on new power transformers. As a result, a portion of power transformer population (i.e., newer transformers that are not required to be routinely tested) will not have 100% DAI. Consequently, the average DAI for Alectra Utilities power transformers will not be 100%.

AMPCO-42

Reference

Exhibit 4, Appendix D, p. 78
Alectra indicates the average DAI for Circuit Breakers is 72.6%.
Please provide the data needed to be collected to take the DAI for Circuit Breakers to 100%.

Response:

For Alectra Utilities to achieve 100% DAI, Alectra Utilities would require that each and every circuit breaker would have a fully completed condition survey, including specific test results, and known age.

It would not be prudent to achieve an average DAI of 100% for circuit breakers since, in order to do so, Alectra Utilities would require to complete ongoing and full testing on new circuit breakers, which is not required. Alectra Utilities does not conduct ongoing tests on new circuit breakers. Further, certain circuit breakers with incomplete installation records and deteriorated or faded nameplates do not have age records. As a result, a portion of the circuit breaker population will not have 100% DAI. Consequently, the average DAI for Alectra Utilities circuit breakers will not be 100%.

AMPCO-43

Reference

Exhibit 4, Appendix E

Kinectrics reviewed Alectra's ACA processes and methodology.

a) Does Kinectrics consider its assessment to be an ACA gap analysis? If not, why not.

b) Please identify the leading or industry best practice standard that Kinectrics compared Alectra's ACA process and methodology to.

c) Please provide the set of criteria Kinectrics used to assess Alectra's ACA.

d) Please discuss how asset age is used in the current ACA model.

e) Please confirm Alectra's harmonized ACA follows the current Kinectrics methodology.

Response:

a) Both Alectra Utilities and Kinectrics' consider the Asset Condition Assessment ("ACA") Assurance Review to include a gap analysis.

b) Alectra Utilities has no knowledge of an industry standard for performing asset condition assessments. Kinectrics, the firm that led the development of the ACA process in North America, has performed many ACAs for utilities across North America and is recognized as an expert in Asset Condition Assessments. Kinectrics' ACA methodology is included in several Conseil Internationale Grands Reseaux Electriques ("CIGRE"), an international council on large electric systems, publications and is aligned with the requirements of the ISO-55000 Standard.

c) Kinectrics Inc. considered the following criteria is assessing Alectra's ACA:

- Input data/information
- Input weighting
- Health Index formulae
- Scoring system
- Data quality assessment
- Basis for sustainment strategy
- Results presentation

d) Alectra Utilities performs condition-based assessment on its assets using Health Indexing. Age is a component in the Health Index ("HI") calculations. Alectra Utilities' HI models have a higher proportionate emphasis on condition parameters than age. Alectra Utilities scores age as a continuous function, consistent with the Gompertz-Makeham Model. Please refer to Exhibit 4, Tab 1, Schedule 1, Appendix D, page 15, for discussion on age scoring. The age score of each asset is adjusted by a weighting prescribed by the Health Index formula. Weighting factors are asset class specific. Where age is the only information available, Alectra Utilities used supplementary information (where feasible) to perform condition-based assessments. For example, Alectra Utilities added granularity in the underground cable model based on cable type, construction (in-duct, direct buried) and injection information (if injection was performed).

e) Alectra Utilities' harmonized ACA does not follow Kinectrics' methodology. Alectra Utilities' ACA exhibits some similarities to the Kinectrics methodology. Similarities include, but are not limited to, Health Indexing, which is computed as composite score of different weighted inputs added together to reflect condition (i.e. additive model). Alectra Utilities does not compute or use effective age in its ACA which follows best industry practice identified by Vanry & Associates in the Alectra Utilities ERZ DSP Assurance Review.

AMPCO-44

Reference

Exhibit 4, Appendix E, p. 4

The data sources for the 'inputs' to the HI calculation include service record information, GIS data, maintenance and visual inspection records, test results, and subject matter expert (SME) input. These are a common source of asset condition information in electric utilities.

Please discuss any data quality limitations observed by Kinectrics related to the data sources identified.

Response:

Please see Alectra Utilities' response to G-Staff-65 c).

AMPCO-45

Reference

Exhibit 4, Appendix E, p. 5

Kinectrics indicates Alectra does not currently have asset degradation curves.

a) Please explain why Alectra does not have asset degradation curves.

b) Please describe industry best practice with respect to the desire to have utility specific asset degradation curves.

c) Would Kinectrics describe Alectra as a utility with limited failure statistics?

Response:

a) In order to generate Alectra Utilities-specific asset degradation curves, failure statistics need to be collected in a uniform and consistent manner over time. Data collection and classification practices are critical factors, in order to produce asset degradation curves. Alectra Utilities formed 2017, only 2.5 years ago. The work to undertake the ACA started almost immediately following consolidation. Consequently, Alectra Utilities has not yet had the benefit of time in order to collect data in a consistent manner over time, as required for the creation of utility-specific degradation curves.

However, Alectra Utilities has commenced to implement harmonized practices to collect and classify the required data, over time. Until then, Alectra Utilities leverages knowledge in Kinectrics' *Asset Depreciation Study for the Ontario Energy Board* (the "Depreciation Study") (please refer to Exhibit 4, Tab 1, Schedule 1, Appendix J). The Depreciation Study was derived based on both industry research and a survey of Ontario utilities. Some of Alectra Utilities legacy utilities were participants in the survey.

b) Having utility-specific asset degradation curves can inform the ACA with emerging trends and patterns. For example, if wood poles of a certain species suffer from faster degradation compared to the general population, an asset specific model can inform the ACA underlying need that need to be identified. The added granularity, once available, will inform future plans. Alectra Utilities 2018 ACA has been categorized by Kinectrics as good utility practice and the use of continuous function degradation curves based on OEB TUL and Max UL

values. “provides a good representation of service life.” (Exhibit 4, Tab 1, Schedule 1, Appendix E, Page 5).

c) As identified above, Alectra Utilities was formed in 2017. As a result, it does not yet possess Alectra Utilities-specific failure statistics. As provided in the Kinectrics’ ACA Assurance Review, Kinectrics acknowledges that Alectra Utilities does not have utility-specific degradation curves. However, it was Kinectrics opinion that “*In the absence of Alectra-specific statistics, use of OEB TUL and Max UL values is reasonable*.” (Exhibit 4, Tab 1, Schedule 1, Appendix E, Page 5).

AMPCO-46

Reference

Exhibit 4, Appendix E, p. 5

Alectra applied a Condition Multiplier.

a) Did any of the legacy utilities apply a Condition Multiplier?

b) Please explain the origin of the Condition Multiplier?

Response:

a) Yes, all of Alectra Utilities' predecessors leveraged condition multipliers in assessing the asset condition. Alectra Utilities provides Table 1 below to summarize the application of condition multipliers at the predecessor utilities.

Table 1 - Condition Multipliers in Legacy Utilities

Asset Class	Legacy Enersource	Legacy Horizon	Legacy HOBI	Legacy Powerstream	Legacy Guelph Hydro
Wood Pole	Yes	No	No	No	Yes
Concrete Pole	No	No	No	No	Yes
Pad-mounted Transformer	Yes	No	Yes	Yes	Yes
Pad-mounted Switchgear	Yes	No	No	Yes	No
Station Power Transformer	Yes	Yes	Yes	Yes	Yes

b) As electrical utilities started to conduct condition-based assessments, in order to transition from age-based replacements schedules, the use of condition modeling through Heath Indexing was adopted. Since Health Index ("HI") is a composite score of multiple inputs, a low dominant condition score may be masked by other inputs with high scores. Condition multipliers are implemented so that once the HI is informed of a critical condition factor, it overrules all other condition parameters. During Kinectrics' review of Alectra Utilities' 2018 ACA (Exhibit 4, Tab 1, Schedule 1, Appendix E, page 5), Kinectrics identified that the use of condition multipliers is a good practice.

AMPCO-47

Reference

Exhibit 4, Appendix E, p. 6

a) With respect to HI Categorization, please provide Kinectrics' recommended timeline for action against each category.

b) Please discuss if timelines for action have changed in the new Aca compared to the ACA's of the legacy utilities.

Response:

a) Alectra Utilities engaged Kinectrics to complete an Assurance Review of Alectra Utilities' 2018 Asset Condition Assessment ("ACA"), as per the scope in in Section 2 of the report, provided in Appendix E. Kinectrics was not asked, nor did it provide a recommended timeline for action against each category. Sub-Section A of Section 5.3.3.2 of the DSP (Exhibit 4, Tab 1, Schedule 1, Page 235 to Page 250) provides a detailed explanation of Alectra Utilities' Planned Asset Replacement strategies for each major asset group. Alectra Utilities engaged Vanry & Associates ("Vanry") to complete an assurance review of the DSP. The Vanry Report is included as Appendix G of the DSP (Exhibit 4, Tab 1, Schedule 1, Appendix G).

b) In the assurance review, Alectra Utilities asked Vanry to examine, amongst all other processes and practices in developing the DSP, Alectra Utilities' application of ACA outputs (i.e. Health Index results) to identify system renewal needs and develop proportionate, timely and effective solutions to address those needs. It is Vanry's observations that *"The process Alectra Utilities used in the development of the DSP is sound."* (Exhibit 4, Tab 1, Schedule 1, Appendix G, Page 16.)

Alectra Utilities wishes to clarify that the ACA process applied in the development of the 2020-2024 DSP was solely used to provide a Health Index for every asset in each major asset category assessed. The Health Index informed Alectra Utilities of the investment needs and timing. Please see Sub-Section A of Section 5.3.3.2 of the DSP (Exhibit 4, Tab 1, Schedule 1, Page 235 to Page 250) for a detailed explanation of Alectra Utilities' Planned Asset Replacement strategies for each major asset group. Since Alectra Utilities' ACA was not developed to produce timelines for action, it is not possible to compare against previous timelines of action results from legacy ACAs.

AMPCO-48

Reference

Exhibit 4, Appendix E, p. 8

a) Please explain why Kinectrics did not validate the inputs.

b) Please provide the list of supporting information reviewed by Kinectrics.

c) Please provide Kinectrics' opinion of the maturity level of Alectra's ACA.

Response:

a) Kinectrics was not required to validate the inputs as that was not part of the engagement scope with Alectra Utilities. As explained in Alectra Utilities' response to G-Staff-65, since the 2018 ACA results did not drive any significant change in the system renewal investments relative to historical condition assessments, Alectra Utilities requested that Kinectrics focus on the harmonized methodology; assumptions; Health Index models; and sustainment selection methodology. Kinectrics was also asked to provide a comparison of Alectra Utilities' in-house ACA to industry Asset Management practices, which Alectra Utilities did improve in with good utility practices.

b) Please refer to Exhibit 4, Tab 1, Schedule 1, Appendix E, Page 1, Section 2.0 - Scope for a list of supporting information that was reviewed by Kinectrics. Supporting information includes: the data harmonization methodology; Health Index Models; sustainment selection methodology; and proposed paced sustainment strategy. These methodologies and practices have been provided in Sections 5.3.1 – Asset Management Overview and 5.3.3 – Asset Lifecycle Optimization of the DSP (Exhibit 4, Tab 1, Schedule 1).

c) Kinectrics indicated that Alectra Utilities' ACA process is at the high end of maturity as compared to other Kinectrics ACA clients.

AMPCO-49

Reference

Exhibit 4, Appendix E, p. 9

Kinectrics provides four recommendations.

a) What additional information would Alectra need to develop Alectra-specific degradation curves based on failure statistics.

b) Please provide Kinectric's assessment of the maturity level of Alectra's ACA if the four recommendations were implemented.

c) Did Kinectrics compare Alectra's ACA to other Ontario utilities? If not, why not? If yes, please provide the findings.

Response:

a) Please see Alectra Utilities' response to G-Staff-89.

b) Kinectrics' opinion is that with the implementation of the four recommendations, Alectra Utilities is near the top of the Asset Condition Assessment ("ACA") maturity level and is almost at "state of the art" level.

c) In order to advance Alectra Utilities to the "state of the art" level, Alectra Utilities would need to implement an Asset Management platform/tool that: enables near real-time updating of ACA results; integrates continuous inputs (i.e., ongoing loading or oil monitoring data); and considers artificial intelligence as well as machine learning. Please see Alectra Utilities' response to AMPCO-48 c).

In reviewing Alectra Utilities' 2018 ACA, Kinectrics was required to review Alectra Utilities' in-house ACA in comparison with good utility Asset Management practices, not other Ontario utilities. A review against good utility practice is more helpful to Alectra Utilities than comparing against other Ontario utilities. In Kinectrics' opinion, Alectra Utilities "*ACA methodology utilized in the report is in line with good utility practices. It provides the required input regarding condition based assets needs. ACA results are used in conjunction with other considerations to develop investment portfolios that address Alectra's sustainment needs*." (Exhibit 4, Tab 1, Schedule 1, Appendix E).

AMPCO-50

Reference

Exhibit 4, Appendix E, p. 9

With respect to model improvements, Kinectrics indicates the sustainment pacing for distribution assets focuses on addressing poor and very poor units. A future improvement to the pacing strategy would be to consider all HI bands while taking into account the probabilistic nature of failures.

Please explain further what is meant by "consider all HI bands while taking into account the probabilistic nature of failures" and how this would inform and impact the pacing strategy.

Response:

Alectra Utilities' harmonized Asset Condition Assessment ("ACA") is condition-based and assesses asset health with respect to the five HI bands. Sustainment pacing currently targets the lower Health Index categories (i.e., bands) of Very Poor and Poor.

Assets in other HI bands (i.e. Fair, Good and Very Good) can also fail and Kinectrics recommended that Alectra Utilities include a subset of assets from other bands in the sustainment pacing.

Alectra Utilities has a substantial amount of assets in the Very Poor and Poor category, including probabilistic estimates of failing assets categorized in Fair, Good and Very Good bands that would increase the system renewal needs. Without Alectra Utilities-specific degradation curves, this approach would not be a prudent inclusion into the DSP. Applying Kinectrics' recommendation would increase the required sustainment pacing, since a portion of assets from other bands would be included in the pacing. The resulting impact would be a higher system renewal investment requirement which Alectra Utilities does not consider to be prudent and in the best interest of customers.

AMPCO-51

Reference

Distribution System Plan, Appendix G, p. 3

Vanry & Associates Inc. provides an opinion of the alignment of Alectra's Assessment Management processes and ACA methodology to established industry best practices.

Please identify the industry standards used.

Response:

The standard of industry best-practice used by Vanry & Associates ("Vanry") for its review of Alectra Utilities' asset management processes, including the ACA, is based on the experience of Vanry's experts in providing asset management services and assessment throughout North America, EU, ANZ, and South Africa that spans nearly two decades. Vanry is able to draw comparisons between Alectra Utilities and other high performing asset management organizations across North America and globally. A summary of Vanry's experience is included in Appendix B of the Vanry Report as Appendix G in the DSP (Exhibit 4, Tab 1, Schedule 1, Appendix G).

Vanry is familiar with published standards, such as ISO 55000, and the principles contained in them are considered in the review, along with other practices that are not included in the published standards. For example, ISO 55000 does not include detailed direction for formulating asset health indices (i.e., ACA). Industry best-practice in this area, particularly in Canada, is an evolved, informal standard based on continual improvement and response to regulatory comments. Furthermore, Alectra Utilities has not formally adopted ISO 55000 as its standard (nor does Vanry recommend that it do so), so a rigorous assessment relative to that standard is not appropriate.

A detailed evaluation of Alectra Utilities' ACA methodology was performed by Kinetrics Inc. However, Vanry did undertake a high-level review of the methodology, particularly with respect to how the ACA was integrated into the overall asset management and budgeting processes. A major criterion in our evaluation was whether Alectra Utilities' process constitutes a coherent, logically consistent approach to identifying, evaluating, and prioritizing work, and whether the

process conforms to the foundational requirements of asset management: customer focused, data driven, transparent and repeatable, and amenable to continuous improvement.

AMPCO-52

Reference

Distribution System Plan, Appendix G, p. 5

Vanry indicates it is concerned that Alectra may not have allocated sufficient funding required to keep up with the cable failure rates.

Did Vanry undertake a review and analysis of Alectra's cable failure data? If yes, please explain.

Response:

Yes, Vanry & Associates ("Vanry") reviewed the cable failure data as provided in the DSP. Vanry completed a review of the DSP and all the appendices, including all processes and methodology documentation in addition to interviews with Alectra Utilities' subject matter experts. As provided in the DSP, reliability of cable (i.e., cable failure data) and cable condition was extensively explained with detail in Appendix A10 of the DSP (Exhibit 4, Tab 1, Schedule 1, Appendix A10, Pages 11 to 16). Based on this review and analysis, Vanry's opinion was that:

> *"Alectra like many utilities in North America, is battling a chronic failure of Underground Residential Distribution ("URD") cable, referred to by Alectra in its DSP documentation as XLPE. Alectra, appropriately, is allocating a large percentage of its system investment to the proactive replacement and refurbishment of the failure-prone URD cable and associated assets. The analysis in the DSP, and our experience with other utilities suggests that at the proposed level of investment, which is significant, may not enable Alectra to stay ahead of the deterioration rates in its URD fleet. It is well understood across the North American distribution sector that reactive replacement work is more costly than proactive replacement work by anywhere from 2 to 6 times. Capital investments in proactive work can reduce the costs of reactive work (both Capital and OMA), often to a better cost impact to customers. This often requires capital investment up front, with the payback to the customer being seen over time.*
>
> *Conversely, utilities that reduce proactive replacement as a means of reducing investment or rates, most often find themselves being pulled into a vicious cycle of having more of their planned replacement funding being consumed with*

responding to reactive replacements. This reduces the amount of planned replacements that can be undertaken, which in turn leads to more reactive spending. Once started, the vicious cycle is extremely difficult to exit and can turn into a so called "death spiral" where all of the planned spending is consumed in a fully reactive mode and reliability deteriorates to universally unacceptable levels. We are concerned that Alectra may not have allocated sufficient funding required to keep up with the cable failure rates. This leaves Alectra and its customers exposed to risk of entering a vicious cycle, if any of the following should occur:

- *Alectra is not able to secure the investment levels that it seeks for URD and associated equipment replacements;*
- *Alectra is not able to execute the work that it has in the plan for URD replacements due to resource limitations (availability of personnel, or as a result of other emergent work such as road widening or storm response) to its current estimated levels; or*
- *The failure rates for the URD cable increase above the current projections."*

Vanry raised two concerns with Alectra Utilities DSP. One concern related to deferral of the Neighborhood DER pilot project and long term implications of higher costs and risk for customers associated with not proceeding with the project. The other concern stemmed from Alectra Utilities proposed investment level in underground asset renewal and that the level set is too close to the risk threshold, such that Alectra Utilities would not be able to manage the emerging number of cables through a reactive response.

AMPCO-53

Reference

Distribution System Plan, Appendix G, p. 15

Historically Alectra used an external consultant to carry out its ACA. Alectra has now moved its ACA in-house.

Please provide Vanry's opinion on the advantages and disadvantages of bringing the ACA in-house versus continuing to use an external consultant.

Response:

Alectra Utilities wishes to clarify that it did not use external consultants to carry out its ACA. The 2018 ACA is Alectra Utilities first consolidated ACA and was completed in-house. Alectra Utilities' predecessor, PowerStream, completed asset condition assessments using in-house resources. However, the other predecessors, Enersource, Brampton Hydro, Guelph Hydro and Horizon Utilities used external consultants to develop previous versions of Asset Condition Assessments ("ACA").

As explained in Section 5.2.1.10 of the Distribution System Plan ("DSP") (Exhibit 4, Tab 1, Schedule 1, Page 52), Alectra Utilities engaged Kinectrics Inc. to undertake and complete an independent, third-party review of Alectra Utilities' 2018 ACA to consider the reasonableness of the ACA, as it is the basis for identifying the company's system sustainment needs.

In the 2017 Assurance Review of the Alectra Utilities' DSP for ERZ (EB-2017-0024, Exhibit 1, Tab 1, Schedule 1, Page 5), Vanry stated that,

> "*the existing routine of using a third-party consultant for the development of the ACA has served its usefulness. Alectra-Mississauga is now far more capable in understanding and executing the ACA on its own using the in-house expertise (supplemented by external experts if needed) and SMEs. We believe that undertaking the ACA in-house would streamline the process of translating ACA results into potential investment plans thus producing greater efficiencies."*

In completing the Assurance Review of Alectra Utilities' 2020-2024 DSP, Vanry provided the following opinion on the practice of completing the ACA in-house versus continuing to use an external consultant. At page 32 of the Vanry Report (Appendix G) Vanry stated:

> *"As recommended, Alectra has brought ACA processes in-house. Not only have they taken over the ACA process, they have substantially improved it and have built a new SQL-based tool to support it. The complexity of integrating data from multiple utilities, with users at multiple locations, made this a difficult and complex task. We commend Alectra for accomplishing it and delivering a high-quality consolidated ACA for use in the current DSP."*

In summary, the advantages of an Alectra Utilities in-house ACA relative to use of external contractors include:

- Streamlining the process to translate ACA results into potential investments;
- Developing internal expertise and competencies necessary to develop systems, processes and practices necessary to provide empirical data to develop Alectra Utilities-specific degradation curves; and
- Producing greater efficiencies and opportunities to develop systems with internal data analytics capabilities and repository of asset information for ongoing operational use.

The disadvantage of an Alectra Utilities in-house ACA relative to use of external contractors is the overall complexity of integrating data from multiple utilities with subject matter experts located at multiple locations.

AMPCO-54

Reference

Distribution System Plan, Appendix G, p. 17

Alectra has removed failure projections from its ACA, which Vanry regards as an improvement.

Please explain how this is seen as an improvement over what was done historically.

Response:

The Asset Condition Assessment ("ACA") method completed by Kinectrics Inc. at four of the predecessor utilities, i.e., Enersource, Horizon Utilities, Brampton Hydro, Guelph Hydro, applied an approach to estimate failure probability as a function of asset health assessment. In the assurance review of the 2018-2022 Alectra Utilities' DSP for ERZ (EB-2017-0024, Exhibit 1, Tab 1, Schedule 1, Page 5), Vanry & Associates ("Vanry") suggested that Alectra Utilities separate failure probability calculations from the ACA process. In Alectra Utilities' harmonized 2018 ACA, the company implemented Vanry's recommendation to separate failure projections from the ACA.

Using the Health Indexing and failure projections separately enables Alectra Utilities to: develop specific asset renewal strategies for each major distribution asset class; and improves the granularity of information used during the system needs identification process. For example, Alectra Utilities considered the condition of station assets independently from failure projections to develop the renewal strategy for station assets. The result of that strategy enabled Alectra Utilities to mitigate the need for station assets renewal through monitoring, which allows Alectra Utilities to focus its investment on deteriorating underground assets.

AMPCO-55

Reference

Distribution System Plan, Appendix G, p. 21

Vanry indicates Alectra has a strong business case using C55. Their only concern is the way projects are identified for inclusion in the business case process.

What specifically are Vanry's concerns regarding the way projects are identified.

Response:

In their review of the Alectra Utilities 2020-2024 DSP (Appendix G of the DSP), Vanry & Associates ("Vanry") acknowledged the strength of C55 in optimizing portfolios of selected projects from among the library of good projects identified by the Asset Management team. Vanry's concern relates to the way projects are identified for inclusion in the library relate to placement of risk assessment in the sequence steps in the Asset Management process.

Both Vanry and Kinectrics identified that completing a risk assessment of the asset failure before identification of investment needs would provide Alectra Utilities with additional information on investments needs. Alectra Utilities' Asset Management process is to focus on Poor and Very Poor condition assets in order to identify investment needs from which a business case is developed. Should Alectra Utilities complete a risk assessment of the assets before identification of risks, the backlog of deteriorated assets in poor and very poor condition, as well as the risk assessed of assets in fair and good condition, would increase the renewal investment need. The result would be an increase the amount of system renewal investment.

Alectra Utilities acknowledges that once a sufficient amount of asset failure data is collected and analyzed, utility-specific degradation curves would provide additional information and consideration for assets in the fair and good condition, which is likely to increase the system renewal investment needs. Instead, Alectra Utilities identifies assets in the poor and very poor condition (where there is a sufficient backlog) amongst other investment need consideration (e.g., reliability, environment, safety etc.)

Alectra Utilities has recognized the benefit of additional risk information, and is in process of developing and implementing an asset risk assessment approach as suggested by Vanry and Kinectrics.

Vanry recognized that this not a deficiency in the near to mid-term as currently Alectra Utilities has identified more cost-effective work than it can execute. In the 2020-2024 DSP Assurance Review as provided in Appendix G of the DSP, Vanry Stated on Page 25 of the report:

> *"We recognize and applaud Alectra's demonstrated commitment to continuous improvement. As we highlight in Appendix A, Alectra has taken recommendations in previous DSP reviews to heart and acted upon them with speed and diligence. In keeping with Alectra's commitment to continuous improvement we offer the following recommendations for Alectra's consideration as it seeks to further develop and enhance its asset management capabilities. These recommendations should not be seen as a deficiency in any way, rather they are a set of logical next steps to support Alectra's growth in capability."*

AMPCO-56

Reference

Distribution System Plan, Appendix G

Please list all of Vanry's engagements with Alectra and the legacy utilities in the past 10 years.

Response:

Alectra Utilities provides Table 1 below which lists all of Vanry & Associates' engagements with Alectra Utilities, as well as its engagements with predecessor utilities over the past ten years.

Table 1 - Alectra Utilities and Legacy Utilities' Engagements with Vanry & Associates

Year	Engagement
2019	Alectra Utilities, DSP Assurance Review
2017	Alectra Utilities, ERZ DSP Assurance Review
2017	Guelph Hydro, DSP Due-diligence Review
2017	Alectra Utilities Depreciation Analysis Support
2015	Pre-Alectra Utilities Merger, Due-diligence DSP Review

AMPCO-57

Reference

Distribution System Plan, Appendix P

Please provide an excel version of Tables P01-1, P01-2, PO1-3 and PO1-4 combined as one table.

Response:

Alectra Utilities has provided an excel version of Tables P01-1, P01-2, PO1-3 and PO1-4 combined as one table in AMPCO-57_Attach 1. A small discrepancy in Appendix P was noted and has been corrected in the accompanying excel version.

AMPCO-57

ATTACH 1

AMPCO-57_Attach 1

Appendix P: By Rate Zone for Historical Expenditures

						Planned Expenditures ($MM)				
System Access	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Central North										
Network Metering	6.9	1.8								
Customer Connections	6.6	- 0.3								
Road Authority & Transit Projects	1.5	3.9								
Transmitter Related Upgrades	-	-								
Central South										
Network Metering	4.2	3.3								
Customer Connections	8.1	8.1								
Road Authority & Transit Projects	0.0	0.5								
Transmitter Related Upgrades	-	-								
East										
Network Metering	3.4	1.8								
Customer Connections	14.8	13.7								
Road Authority & Transit Projects	7.4	7.3								
Transmitter Related Upgrades	-	-								
West										
Network Metering	2.3	2.1								
Customer Connections	3.6	9.7								
Road Authority & Transit Projects	1.3	2.6								
Transmitter Related Upgrades	-	-								
Alectra										
Network Metering	16.9	9.0	11.7	10.3						
Customer Connections	33.0	31.2	26.5	24.8						
Road Authority & Transit Projects	10.2	14.3	23.2	30.8						
Transmitter Related Upgrades	-	-	-	-						
Guelph										
Network Metering	1.2	0.4	0.5	0.5						
Customer Connections	0.3	0.6	0.5	0.4						
Road Authority & Transit Projects	- 0.7	0.1	0.2	0.2						
Transmitter Related Upgrades	-	-	-	-						
Total Alectra										
Network Metering	18.1	9.4	12.2	10.8	14.3	14.8	14.3	10.2	11.6	12.2
Customer Connections	33.3	31.8	26.9	25.2	34.7	31.4	33.1	34.8	36.3	37.7
Road Authority & Transit Projects	9.6	14.4	23.5	31.0	27.9	19.7	17.3	18.2	19.2	20.3
Transmitter Related Upgrades	-	-	-	-	0.5	0.6	2.2	-	-	-
Total	**61.0**	**55.6**	**62.6**	**67.0**	**77.4**	**66.5**	**66.9**	**63.2**	**67.1**	**70.2**

						Planned Expenditures ($MM)				
System Renewal	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Central North										
Overhead Asset Renewal	4.4	1.5								
Reactive Capital	1.6	1.8								
Rear-lot Conversion	-	-								
Substation Renewal	0.3	2.3								
Transformer Renewal	0.4	0.2								
Underground Asset Renewal	3.1	1.4								
Other System Renewal										
Central South										
Overhead Asset Renewal	8.1	10.5								
Reactive Capital	0.3	0.3								
Rear-lot Conversion	-	-								
Substation Renewal	7.2	5.2								
Transformer Renewal	12.2	8.5								
Underground Asset Renewal	16.9	15.9								
Other System Renewal										
East										

Overhead Asset Renewal	8.4	10.2								
Reactive Capital	11.2	8.4								
Rear-lot Conversion	3.3	2.8								
Substation Renewal	2.0	2.8								
Transformer Renewal	1.6	1.5								
Underground Asset Renewal	20.8	16.4								
Other System Renewal										
West										
Overhead Asset Renewal	10.8	10.6								
Reactive Capital	3.4	3.9								
Rear-lot Conversion	0.7	1.8								
Substation Renewal	0.0	0.2								
Transformer Renewal	0.2	0.3								
Underground Asset Renewal	2.2	6.1								
Other System Renewal										
Alectra										
Overhead Asset Renewal	31.7	32.9	40.3	36.7						
Reactive Capital	16.5	14.4	15.3	20.1						
Rear-lot Conversion	4.0	4.6	3.4	- 0.0						
Substation Renewal	9.6	10.6	9.1	10.2						
Transformer Renewal	14.4	10.5	11.0	13.5						
Underground Asset Renewal	43.0	39.7	47.6	42.8						
Other System Renewal	-	-	1.6	1.5						
Guelph										
Overhead Asset Renewal	1.5	2.2	2.6	2.8						
Reactive Capital	0.1	0.2	0.2	0.5						
Rear-lot Conversion	-	-	-	0.1						
Substation Renewal	-	-	-	0.2						
Transformer Renewal	0.3	0.4	0.5	0.5						
Underground Asset Renewal	1.3	3.5	4.1	0.8						
Other System Renewal										
Total Alectra										
Overhead Asset Renewal	33.2	35.1	43.0	39.5	45.4	34.3	34.7	39.4	30.9	37.6
Reactive Capital	16.7	14.6	15.6	20.5	17.2	18.8	19.2	19.6	20.0	20.4
Rear-lot Conversion	4.0	4.6	3.4	0.0	5.1	4.8	1.2	1.2	4.2	8.5
Substation Renewal	9.6	10.6	9.1	10.4	5.0	12.8	4.4	2.8	3.2	5.5
Transformer Renewal	14.7	10.9	11.5	14.0	12.3	5.5	6.3	7.0	7.4	7.8
Underground Asset Renewal	44.3	43.3	51.8	43.6	45.5	61.1	74.5	82.2	88.5	95.5
Other System Renewal	-	-	1.6	1.5	1.6	1.7	1.7	1.8	1.9	1.9
Total	**122.5**	**119.1**	**136.0**	**129.5**	**132.1**	**139.0**	**142.0**	**154.0**	**156.1**	**177.3**

						Planned Expenditures ($MM)				
System Service	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Central North										
SCADA & Automation	0.3	0.4								
Capacity (Lines)	5.8	3.9								
Capacity (Stations)	0.1	0.0								
System Control, Communications & I	-	-								
Safety & Security	0.0	-								
Distributed Energy Resources (DER)	-	-								
Central South										
SCADA & Automation	3.1	2.9								
Capacity (Lines)	3.9	1.9								
Capacity (Stations)	2.0	2.6								
System Control, Communications & I	-	-								
Safety & Security	-	-								
Distributed Energy Resources (DER)	-	-								
East										
SCADA & Automation	1.2	1.6								

Capacity (Lines)	6.8	10.6								
Capacity (Stations)	12.0	13.5								
System Control, Communications & I	2.9	1.4								
Safety & Security	0.2	0.3								
Distributed Energy Resources (DER)	-	-								
West										
SCADA & Automation	-	-								
Capacity (Lines)	3.1	1.3								
Capacity (Stations)	-	-								
System Control, Communications & I	1.5	0.1								
Safety & Security	1.0	- 0.2								
Distributed Energy Resources (DER)	-	-								
Alectra										
SCADA & Automation	4.7	4.9	5.6	4.1						
Capacity (Lines)	19.7	17.7	22.7	12.9						
Capacity (Stations)	14.1	16.1	10.3	2.4						
System Control, Communications & I	4.4	1.5	2.7	2.8						
Safety & Security	1.2	0.1	1.2	0.9						
Distributed Energy Resources (DER)	-	-	-	-						
	-	-	-	-						
Guelph										
SCADA & Automation	0.2	0.4	0.4	0.4						
Capacity (Lines)	1.5	0.9	1.1	0.5						
Capacity (Stations)	2.9	1.5	0.0	-						
System Control, Communications & I	0.3	0.3	0.2	0.3						
Safety & Security	-	-	-	-						
Distributed Energy Resources (DER)	-	-	-	-						
Total Alectra										
SCADA & Automation	4.9	5.3	6.0	4.5	2.8	3.4	3.6	3.7	3.8	4.7
Capacity (Lines)	21.2	18.6	23.8	13.4	8.0	21.1	24.0	23.9	26.4	14.8
Capacity (Stations)	17.0	17.6	10.3	2.4	2.7	0.8	0.8	0.8	5.2	12.0
System Control, Communications & I	4.7	1.7	2.9	3.1	5.9	6.6	5.8	4.7	4.1	2.8
Safety & Security	1.2	0.1	1.2	0.9	3.2	5.4	2.0	2.0	2.0	2.0
Distributed Energy Resources (DER)	-	-	-	-	0.9	0.7	0.7	0.9	0.9	0.9
	-	-	-	-	-	-	-	-	-	-
Total	**49.0**	**43.3**	**44.2**	**24.3**	**23.5**	**38.0**	**36.9**	**36.0**	**42.4**	**37.2**

						Planned Expenditures ($MM)				
General Plant	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Central North										
Facilities Management	0.3	0.2								
Information Technology	1.1	0.5								
Tools, Shop and Garage Equipment	0.1	0.1								
Fleet Renewal	2.1	- 0.3								
Connection and Cost Recovery Agre	7.7	-								
Other General Plant	0.4	- 0.0								
Central South										
Facilities Management	1.9	1.0								
Information Technology	4.9	1.5								
Tools, Shop and Garage Equipment	0.3	0.2								
Fleet Renewal	2.5	1.6								
Connection and Cost Recovery Agre	40.5	-								
Other General Plant	-	-								
East										
Facilities Management	4.2	0.5								
Information Technology	14.9	5.5								

Tools, Shop and Garage Equipment	0.3	0.4								
Fleet Renewal	1.7	1.8								
Connection and Cost Recovery Agre	-	0.9								
Other General Plant	0.9	0.7								
West										
Facilities Management	5.0	3.0								
Information Technology	3.3	1.1								
Tools, Shop and Garage Equipment	0.4	0.3								
Fleet Renewal	0.7	0.6								
Connection and Cost Recovery Agre	6.6	- 0.5								
Other General Plant	0.1	0.4								
Alectra										
Facilities Management	11.4	4.7	4.5	1.4						
Information Technology	24.2	8.7	4.4	4.7						
Tools, Shop and Garage Equipment	1.1	1.0	0.8	0.7						
Fleet Renewal	6.9	3.7	3.1	6.2						
Connection and Cost Recovery Agre	54.8	0.4	-	6.8						
Other General Plant	1.4	1.1	3.8	2.6						
	-	-	-	-						
Guelph										
Facilities Management	0.2	0.1	0.7	0.0						
Information Technology	0.6	0.5	0.6	0.1						
Tools, Shop and Garage Equipment	0.1	0.1	0.1	0.1						
Fleet Renewal	0.6	0.6	0.1	0.5						
Connection and Cost Recovery Agre	-	-	-	-						
Other General Plant	-	-	-	-						
Total Alectra										
Facilities Management	11.6	4.8	5.2	1.4	3.7	4.2	2.6	2.9	4.6	3.5
Information Technology	24.8	9.2	5.0	4.8	10.2	15.1	18.2	19.8	12.3	8.4
Tools, Shop and Garage Equipment	1.2	1.1	0.9	0.7	1.7	1.3	1.3	1.3	1.3	1.3
Fleet Renewal	7.5	4.3	3.2	6.7	8.5	8.9	9.5	9.9	10.3	10.2
Connection and Cost Recovery Agre	54.8	0.4	-	6.8	1.0	8.7	1.6	-	0.5	-
Other General Plant	1.4	1.1	3.8	2.6	1.1	1.1	1.2	1.2	1.2	1.3
	-	-	-	-	-	-	-	-	-	-
Total	**101.3**	**20.8**	**18.1**	**23.0**	**26.2**	**39.4**	**34.4**	**35.1**	**30.2**	**24.7**
	333.8	238.8	260.9	243.9	259.2	282.9	280.2	288.3	295.9	309.4

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Reference

EB-2016-0025 LDC Co_Business Plan, Appendix 9-B, p. 4 (Filed as Appendix A)

As part of the Merger, Vanry + Associates, Inc. (VAI) was engaged to undertake an independent, third-party review in support of the due diligence process related to the potential merger of four Local Distribution Companies (LDCs). The scope of the review was to evaluate the respective Asset Condition Assessment (ACA) methodologies and resulting capital investment planning processes, as well as to assess the overall asset health and subsequent 20-year investment for each of the four LDCs.

A finding from Vanry's review is provided below:

> In our review, we did not identify any aspects of an individual LDC's approach, or anything in the potential combination of LDC's that we would expect to result in dramatic changes in overall spending levels in a combined LDC. We do believe that certain approaches among the LDCs are sufficiently different that combining the four could lead to the potential for reductions in overall spending. We also see a distinct possibility that a merged LDC, adopting a common set of leading practices, could lead to the overall capital investment program being redistributed among the respective systems in proportions that are different than the current allocations. This is due in part from different assessments of criticality and in part in recognition of the current variations in system performance and failure rates among the four LDCs. In short a merged entity would expect to see funding flowing to the areas of greatest value, or greatest risk potential. We observed from the reports that the range of need among the systems varies sufficiently that spending might flow to the portions of the combined system with the greatest need.

a) Please summarize how the needs of the systems of the legacy utilities varies.

b) Please explain how Alectra has directed 2020 to 2024 funding to the areas of greatest value, greatest risk potential or greatest need.

Response:

a) The following is a summary of the significant differences investment needs by operating zones:

- Overhead Asset Renewal is higher in the west operational zone related to the need for voltage conversion (see Exhibit 4, Tab 1, Schedule 1, Appendix A05 for more information).
- Underground Asset Renewal is most pronounced in the central south and east operational zones due to the higher underground system renewal needs(see Exhibit 4, Tab 1, Schedule 1, Appendix A10 for more information)
- Customer Connections are higher in the East operational zone due to the growth in that area (see Exhibit 4, Tab 1, Schedule 1, Appendix A02 for more information)

- Lines Capacity investments are primarily driven by the pockets of greenfield expansion in the East operational zone (see Exhibit 4, Tab 1, Schedule 1, Appendix A12 for more information).
- There is a greater need for rear lot conversions in the east operational zone (see Exhibit 4, Tab 1, Schedule 1, Appendix A07 for more information).

b) Alectra Utilities has allocated capital investment based on identified needs and areas of greatest value, greatest risk mitigating potential or greatest need through the Asset Management process, discussed in Exhibit 4, Tab 1, Schedule 1 Section 5.3.1.3. Through this comprehensive process, the needs across all operational areas are identified and developed into business cases. They are then evaluated in a uniform manner, using a common value framework by identifying the Value Measures specific to each distinct investment. Alectra Utilities' Value Framework considers both the benefits and risk that will be mitigated. Through the Copperleaf C55 optimization tool, these value measures are calculated into a present value for each investment need and compared against all other investments to produce the optimal capital investment portfolio.

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Reference

EB-2016-0025 LDC Co_Business Plan, Appendix 9-B, p. 15

With respect to Condition Assessment for the former Powerstream, the following assessment by Vanry was compared against the Criterion Definition of Condition Assessment (first column).

Condition Assessment Asset conditions are assessed relative to end-of-life failure criteria (i.e. Health Index). Health Index includes relevant parameters for predicting failure based on known degradation processes, and excludes other factors such as those related to criticality or obsolescence. Age is not included as a condition criterion.	Health Indices are based on major degradation processes and end of life criteria. The formulations are generally within the range of best practice, although recent improvements in the industry (e.g. multiplicative formulation) have not been applied. PowerStream has a strong testing and inspection program with good data availability. The multiplicative approach to health indexing is in contrast to the additive approach used by all four utilities in this review. It is a recent industry innovation wherein condition parameters are multiplied together rather than added. It avoids some of the common problems: "masking," where a bad test result is hidden amid several good ones, and validity, where there are not enough data available to calculate a valid health index. Age is excluded from most formulations. Factors related to obsolescence or consequences (e.g. oil circuit breakers, PCB transformers) are excluded from the formulations.

a) Please confirm the source of the recent industry improvements.

b) Please discuss if the recent improvements in the industry not applied have now been applied in Alectra's harmonized ACA. i.e. does Alectra's current HI model follows a multiplicative approach or an additive approach? If not, why not.

c) If now a multiplicative approach, please discuss the key changes in the model and the impact on the results.

d) Please discuss what is meant by "Age is excluded from most formulations" and whether that is a best practice.

e) Please confirm criticality and obsolescence are excluded from the formulations in the Alectra harmonized ACA.

Response:

a) As discussed in Alectra Utilities' response to AMPCO-51, neither Alectra Utilities, nor the consultants - Vanry & Associates ("Vanry") and Kinectrics, are aware of industry standards for completion of electrical distributions asset condition assessments ("ACA"). Similarly, recent industry improvements are a part of the industry's continuous improvement in assessing

condition of assets. Vanry is relying on its work with entities in the industry and observations made during engagements.

b) Alectra Utilities' models follow an additive approach and not a multiplicative one. Legacy utilities that formed Alectra Utilities used additive models. Part of maintaining consistency between legacy practices and the harmonized practice is adopting similar types of models (i.e., additive). Alectra Utilities does utilize a condition multiplier in its models to overcome the masking issue of additive models. The use of condition multipliers is good utility practice as discussed in Alectra Utilities' response to G-Staff-79.

c) In order to use multiplicative models, Alectra Utilities would require new types of inputs to be collected and new models to be developed. Alectra Utilities cannot comment or speculate on the impact of models that are not in use.

d) Vanry is referring to the Health Index formulation and the inclusion of age in the formula. As discussed in Alectra Utilities' response to AMPCO-51, there is no standard for conducting ACAs. Good utility practices is not a function of the inclusion or exclusion of age, but rather the treatment of age and how it informs and reflects the asset's health. Alectra Utilities' models have a heavy emphasis on condition-parameters and less on age. Kinectrics Inc. reviewed Alectra Utilities' ACA practices and made the following conclusion in Appendix E (Exhibit 4, Tab 1, Schedule 1, Appendix E):

> *"Kinectrics concluded that Alectra's ACA is aligned with good utility practices. The processes, methodologies, and results are appropriate in serving as the basis for identifying system sustainment needs"*

Alectra Utilities uses age as a proxy to unobserved conditions. Vanry provided the following opinion on Alectra Utilities' treatment of age (Exhibit 4, Tab 1, Schedule 1, Appendix G, page 29):

> "*Given that Alectra's fundamental goal in calculating asset health is to make an estimate of failure probability, we believe that their argument for including age is reasonable."*

e) Alectra Utilities' ACA excludes criticality from the formulations of Health Indices. Obsolescence is included as a condition multiplier for station circuit breakers. For a further discussion on the obsolescence condition multiplier, please see Alectra Utilities' response to G-Staff-87.

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Reference

Exhibit 4, Tab 1, Schedule 1

Please complete the attached spreadsheet (Attachment #1).

AMPCO-60 Attachment #1													
Asset Renewal Rate													
						Sustainment Strategy							
Asset Class	Population in ACA	# in very poor & poor condition in ACA	# at or Beyond End of Useful Life (EUL)	# in very poor & poor condition & at of Beyond End of Useful Life (EUL)	Data Availability Index % in ACA	Baseline Pace Quantity Per Year	Moderate Pace Quantity Per Year	Slow Pace Quantity Per Year	Historical Asset Quantity Replaced 2014 to 2018	Forecast Asset Quantity Per Year 2020 to 2024	Forecast Quantity Per Year 2020 to 2024 in very poor & poor condition	Forecast Quantity Per Year 2020 to 2024 beyond EUL	Forecast Quantity Per Year 2020 to 2024 in very poor & poor condition & beyond EUL
Padmount Transformer													
Polemount Transformer													
Vault Transformer													
Padmounted Switchgears													
Overhead Switches													
Overhead Conductors													
Wood Poles													
Concrete Poles													
Primary XLPE Cables													
Primary PILC Cables													
Primary EPR Cables													
Station Assets													
Power Transformers													
Circuit Breakers													
Station Switchgear													

Response:

Alectra Utilities provides the completed spreadsheet as AMPCO-60-Attach 1. Alectra Utilities wishes to clarify the information that is presented in the attachment with the following statements:

- pacing quantities found in “Columns G, H, and I” are sourced from the 2018 Asset Condition Assessment (Exhibit 4, Tab 1, Schedule 1, Appendix D);
- historical quantities found in “Column J” are provided for the period 2015-2018, consistent with the requirements of the DSP; and the quantity of cable replacements includes cable injections.
- Forecast quantities found in “Columns K, L, M, N” are provided based on the investment narratives’ quantities.

- Information regarding capital expenditures for 2015 and 2016 Historical Years is based on the capital plans of Alectra Utilities' individual predecessor utilities, which approached capital spending in a manner specific to their individual needs. The 2015 and 2016 historical expenditure information has been prepared for purposes of meeting the Filling Requirements by mapping these historical expenditures for the individual predecessor companies to current activities where possible. As the 2015 and 2016 capital expenditure decisions were not made by Alectra Utilities, but rather, by separate corporate entities, that historical expenditure information does not provide an appropriate basis for comparison or from which reasonable conclusions can be drawn.

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ATTACH 1

AMPCO-60 Attach 1
Asset Renewal Rate

						Sustainment Strategy								
Asset Class	**Population in ACA**	**# in very poor & poor condition in ACA**	**# at or Beyond End of Useful Life (EUL)**	**# in very poor & poor condition & at of Beyond End of Useful Life (EUL)**	**Data Availability Index % in ACA**	**Baseline Pace Quantity Per Year**	**Moderate Pace Quantity Per Year**	**Slow Pace Quantity Per Year**	**Historical Asset Quantity Replaced 2014 to 2018**	**Forecast Asset Quantity Per Year 2020 to 2024**	**Forecast Quantity Per Year 2020 to 2024 in very poor & poor condition**	**Forecast Quantity Per Year 2020 to 2024 beyond EUL**	**Forecast Quantity Per Year 2020 to 2024 in very poor & poor condition & beyond EUL**
Padmount Transformer	79487	1700	797	85	95.0%								
Polemount Transformer	32123	1015	409	173	92.0%	600	400	300	3669	550	550	317	317
Vault Transformer	13345	283	752	43	80.5%								
Padmounted Switchgears	3389	586	65	60	94.7%	117	78	59	324	83	83	16	16
Overhead Switches	3889	330	147	147	100.0%	66	44	33	394	44	44	28	28
Overhead Conductors	16400	380	102	102	100.0%	76	51	38	2.1	0	0	0	0
Wood Poles	105569	8547	702	511	68.7%	1709	1140	855	4545	892	892	4	4
Concrete Poles	25340	1292	644	644	88.0%	258	172	129					
Primary XLPE Cables	21638	3156	1710	1647	100.0%	631	421	316		437	135	135	135
Primary PILC Cables	410	17	2	2	100.0%	3	2	2	591	0	0	0	0
Primary EPR Cables	91	0	0	0	100.0%	0	0	0		0	0	0	0
Station Assets													
Power Transformers	295	34	2	0	77.0%	N/A	N/A	N/A	9	0.4	0	0	0
Circuit Breakers	1271	406	30	24	72.6%	N/A	N/A	N/A	169	7.6	5.8	0	0
Station Switchgear	356	36	13	1	85.2%	N/A	N/A	N/A	38	1.8	0.6	0	0

AMPCO-61

Reference

Exhibit 4, Tab 1, Schedule 1

Please complete the attached spreadsheet (Attachment #1).

AMPCO-61 Attachment #1															
Historical Asset Failures															
	# Failures 2014	# Failures 2015	# Failures 2016	# Failures 2017	# Failures 2018	# Customer Interruptions 2014	# Customer Interruptions 2015	# Customer Interruptions 2016	# Customer Interruptions 2017	# Customer Interruptions 2018	# Customer Interruption Minutes 2014	# Customer Interruption Minutes 2015	# Customer Interruption Minutes 2016	# Customer Interruption Minutes 2017	# Customer Interruption Minutes 2018
Asset Class															
Padmount Transformer															
Polemount Transformer															
Vault Transformer															
Padmounted Switchgears															
Overhead Switches															
Overhead Conductors															
Wood Poles															
Concrete Poles															
U/G Primary XLPE Cables															
U/G Primary PILC Cables															
U/G Primary EPR Cables															
Station Assets															
Power Transformers															
Circuit Breakers															
Station Switchgear															

Response:

Alectra Utilities provides AMPCO-61_Attach 1 populated with the requested data to the best of Alectra Utilities' ability to do so, based on current classification categories.

AMPCO-61

ATTACH 1

AMPCO-61_Attach1

Historical Asset Failures

	# Failures 2014	# Failures 2015	# Failures 2016	# Failures 2017	# Failures 2018	# Customer Interruptions 2014	# Customer Interruptions 2015	# Customer Interruptions 2016	# Customer Interruptions 2017	# Customer Interruptions 2018	# Customer Interruption Minutes 2014	# Customer Interruption Minutes 2015	# Customer Interruption Minutes 2016	# Customer Interruption Minutes 2017	# Customer Interruption Minutes 2018	Note
Asset Class																
Padmount Transformer																
Polemount Transformer	333	306	321	297	327	21,214	11,054	11,620	42,371	15,565	2,155,621	1,679,719	1,704,058	2,114,599	2,145,860	The data can not be split due to the different way of recording for each zones. For example, Legacy Enersource only record transformer as one category, Legacy Horizon split the category by transformer rating.
Vault Transformer																
Padmounted Switchgears	46	40	33	26	40	29,438	17,595	30,723	31,982	56,126	1,544,373	1,176,316	1,621,802	1,027,876	2,633,029	
Overhead Switches	121	117	78	110	110	54,653	36,085	36,494	50,125	106,878	1,734,429	2,418,067	756,551	2,516,170	5,679,625	
Overhead Conductors	12	14	13	10	14	1,415	7,064	6,248	2,014	4,301	125,637	6,234,802	239,397	59,284	432,545	Legacy Enersource does not split O/H conductor form O/H harware, Legacy Powerstream does not have O/H conductor category
Wood Poles	3	3	4	5	1	4,595	1,360	6,885	6,914	3,274	39,093	293,764	508,169	319,868	103,803	Only Legacy Hydro One Brampton, Legacy Guelph Hydro and Legacy Powerstream recorded pole failures in their outage cause code however, there is no distinction between wood and concrete poles.
Concrete Poles																
U/G Primary XLPE Cables	410	559	541	477	534	138,717	183,888	177,149	163,118	182,122	10,442,567	12,577,276	12,506,658	11,421,229	13,653,178	
U/G Primary PILC Cables	16	18	12	11	14	19,124	13,010	12,660	9,031	19,340	2,040,423	408,305	1,042,275	1,832,218	1,866,660	
U/G Primary EPR Cables	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Alectra Utilities does not have U/G primary EPR cables fault recors for any legacy
Station Assets																
Power Transformers	1	0	0	0	2	1,750	0	0	0	2,326	117,388	0	0	0	31,980	Only Legacy Powerstream has record on Power Transformers
Circuit Breakers	4	0	2	0	0	2,767	0	29,466	0	0	107,220	0	929,609	0	0	Only Legacy Powerstream has record on Circuit Breakers
Station Switchgear	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Alectra Utilities does not (nor do legacy utilities) record and track station switchgear faults.