TRANSMISSION BUSINESS PERFORMANCE

1.0 INTRODUCTION

Hydro One is focused on the strategic goals and performance targets in the area of safety, customer satisfaction, reliability, shareholder value, and productivity. This Exhibit illustrates the historical business performance of Hydro One’s Transmission Business in these areas with the exception of Productivity, which is addressed separately in Exhibit A, Tab 18, Schedule 1. Utility performance assessment also involves comparisons with other utilities which are a priority of the Board and stakeholder community. This Exhibit includes a brief discussion of the issues with benchmarking and provides a comparison to other utilities. These comparisons focus on the established Canadian Electricity Association (CEA) composite performance which is the aggregate performance of CEA participating transmission utilities. Other comparison perspectives that are evolving within the industry, on a North American scale, are also presented.

2.0 PERFORMANCE MEASUREMENT PROCESS

The first approach to establish Hydro One Transmission’s performance levels entails monitoring actual performance over time. This Exhibit provides Hydro One’s performance on its targeted areas, utilizing historical data drawn from Hydro One’s own records.

The second approach involves comparison with other transmission utilities, particularly for reliability performance. This is a much more complex undertaking that requires careful consideration of following:
• measurement definition;
• data collection processes which impact on the consistency and accuracy of the reported measures; and
• variations such as climate, operating environment and system infrastructure among transmission companies that can influence the absolute performance of their transmission systems.

A way to reduce the effect of these factors is to observe year-over-year performance using consistent and precise measurement definitions. Although transmitters each have a slightly different approach when measuring their own transmission system performance, the Canadian Electricity Association (CEA) has had success in creating reliability performance definitions with sufficient precision and consistency over the years to permit some degree of multi-jurisdictional transmission system performance comparisons. The data, however, is not audited and the comparisons are used only to help identify opportunities for business improvement. This Exhibit presents Hydro One’s transmission system performance relative to a CEA composite performance where available.

3.0 HEALTH AND SAFETY PERFORMANCE

Health and Safety is the foundation of every action, every project, every day for all staff regardless of position or level. The Company continues to develop, implement and maintain progressive programs and initiatives for accident prevention with a concentrated focus on the elimination of serious injuries and “near-misses”. The goal is to create and maintain an injury-free workplace.

Hydro One has continued with the Journey to Zero safety initiative that was started in 2009. This initiative compares our approach to health and safety management with world
class companies to identify gaps. Opportunities for improvement have been prioritized and action plans implemented. Some of the new initiatives currently being developed include but are not limited to:

- Develop a *work environment* whereby employees have more direct involvement into suggesting ways to improve safety both on the job, and in operational plans;
- Identify a framework to instill Health and Safety in the shared beliefs and actions of all employees for themselves and their co-workers. Ensure it is a way of life and a condition of employment in the Hydro One culture.; and
- Identify opportunities and recommend solutions to reduce exposure to safety risks of MVAs.

During 2013, there was a focus on the following areas:

- Journey to Zero initiatives (including a safety culture assessment by DuPont: a survey, site assessment, leadership interviews and focus groups);
- obtaining and maintaining OHSAS 18001 registration, skills and safety training;
- field coaching/mentoring, young and new worker safety; and
- a number of employee health and wellness initiatives.

The successful OHSAS 18001 registration of the Hydro One Health, Safety and Environment Management System will enhance health & safety performance through a structured approach that drives continual improvement and effective risk and hazard assessment and management.

The Hydro One executive and senior management continue to demonstrate visible leadership to reinforce our health and safety vision through site visits and face-to-face discussions with employees.
Since the Hydro One safety program encompasses the entire company, safety performance is tracked throughout the company and performance measure results are not divided between the transmission and distribution businesses. The results presented in this evidence are for all of Hydro One.

As part of its safety program, Hydro One tracks a number of measures. Historically, the focus was on the Lost Time Injury measure. Lost Time Injuries are those injuries that result in Hydro One employees having to take time off to recover before they can return to work. Recent results have been included in Figure 1 to provide continuity to past results reported in previous rate filings. The Lost Time Injury measure has now been replaced by the Medical Attentions measure as the primary measure of safety performance.

Figure 1:
Lost Time Injury Frequency Rate

Lost Time Injuries

<table>
<thead>
<tr>
<th>Year</th>
<th>Lost Time Injuries per 200,000 hours worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>0.3</td>
</tr>
<tr>
<td>2006</td>
<td>0.2</td>
</tr>
<tr>
<td>2007</td>
<td>0.1</td>
</tr>
<tr>
<td>2008</td>
<td>0.0</td>
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<td>2009</td>
<td>0.0</td>
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<td>2010</td>
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<tr>
<td>2011</td>
<td>0.0</td>
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<tr>
<td>2012</td>
<td>0.0</td>
</tr>
<tr>
<td>2013</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Comparison to the CEA Average and Hydro One Networks.
In recent years, Hydro One has implemented the Medical Attentions measure in favour of the Lost Time Injury (LTI) metric as its primary Health and Safety performance measure. The Medical Attentions metric measures the number of injuries that require treatment by a medical practitioner (i.e. beyond first aid). The frequency of the LTI type measure occurrences is low and does not provide the best measure upon which to base Hydro One’s improvement initiatives. The Medical Attentions measure captures a broader number of occurrences than LTI and in so doing, provides more opportunities to identify potential injury situations and their avoidance as part of the objective of having an injury-free workplace. This Medical Attentions metric will measure the impact that our planned improvement initiatives will have on the prevention of injuries that are more serious than requiring basic first aid.

The Medical Attention metric is aligned with the Canadian Electricity Association (CEA) recordable rate metric and the US Occupational Safety and Health Administration (OSHA) recordable metric. Hydro One can compare its performance to other Canadian utilities using the recordable injury metric as shown in Figure 2.
Hydro One continues to build on the strength of its achievements and focus on safety through its health and safety management program and Journey to Zero initiative to achieve an injury-free workplace.

4.0 CUSTOMER SERVICE PERFORMANCE

Hydro One is in business to serve its customers and as such, customer satisfaction is a high priority for the company. To gauge satisfaction, the company surveys customers on their satisfaction with the service that they have been receiving. Surveys are administered to both major load and generator customers, and survey questions are focused on areas of importance to customers such as reliability, communications, relationships, and responsiveness. Figure 3 illustrates the overall results from surveys that have been conducted in recent years.
* Note: In 2005 there was no satisfaction survey carried out of the Generator Customers due to the Hydro One labour disruption.

As evidenced by the results in Figure 3, Hydro One’s major load customers have indicated a relatively high satisfaction during the past several years, though a gradual decline in customer satisfaction in the major load customer sector since 2007 has been noted. This segment trend has seen its first year of improvement in 2013. This segment includes industrial customers and Local Distribution Companies (LDCs). Hydro One is actively addressing these results.

Reliability and more specifically power quality has been identified as a growing concern and that it is having a significant impact on the customers costs related to lost production.
or damage to product. Initiatives regarding customer engagement for power quality improvements can be found in Exhibit A, Tab, 4, Schedule 1.

Industrial customers have requested Hydro One to help them to reduce their costs through more effective management of planned outages on the transmission system. Efforts to bundle work programs on transformers and circuits to minimize transmission related outages are incorporated in the Hydro One’s business plans going forward. See Exhibit A, Tab 16, Schedule 6 for more details on this effort.

LDCs are expressing concern over Hydro One’s aging infrastructure and related reliability and the speed at which our work programs are addressing their concerns. Transformer and breaker replacement programs top the list of immediate concerns. Transformer capacity constraints in southern and eastern portions of the province are adding to the LDC stress, and a higher level of frustration was voiced by LDCs in the south at the inability to connect renewable generation projects within their service territories. Continual measurement of customer satisfaction and follow-up actions are examples of Hydro One’s customer focus to meet and/or exceed customer expectations.

For generator customers, overall satisfaction with Hydro One is variable year over year but statistically fairly stable from the first survey conducted in 2004 through to including the latest 2013 survey results. The largest point of dissatisfaction with the generators is related to planned outages requiring them to reduce output or disconnect. Similar to the industrial customers, the generators will be included in the work bundling efforts to reduce these impacts. Hydro One staff are following up with those customers that indicated that they were either neutral or dissatisfied in order to gain specific feedback that will lead to ways of improving performance.
5.0 RELIABILITY PERFORMANCE

5.1 Transmission Reliability

Hydro One measures and actively monitors its transmission system reliability from two principle perspectives, namely: equipment performance and delivery performance. The equipment performance perspective enables Hydro One to assess the operational performance of transmission components, ensuring that the transmission equipment is functioning according to design. The delivery performance perspective establishes a measure of how reliably electricity is delivered to transmission customers such as Local Distribution Companies and large Industrial Customers. Being a customer focused organization, Hydro One considers delivery of electricity an important measure of transmission reliability and it strives to achieve a high level of performance in this area.

Transmission reliability is determined primarily using measures developed collaboratively with other transmission utilities across Canada at the Canadian Electricity Association (CEA). These measures have had success since they are well defined and understood by the participating member utilities and the definitions are of sufficient precision and consistency over years for multi-jurisdictional transmission performance comparisons.

5.2 Transmission Reliability Measures

Hydro One’s service quality includes transmission system equipment performance and delivery of electricity performance measures. Four measures are listed in Table 1. Delivery Points are generally the interfaces between Hydro One’s transmission system and its load customers. Delivery Points are either low voltage buses at Hydro One owned
step-down transformer stations\(^1\), or stations owned by transmission load customers, including Hydro One Distribution stations.

Delivery reliability is measured by frequency of delivery point interruptions, duration of delivery point interruptions and delivery point unreliability Index which is a normalized measure of unsupplied energy to customers. All interruptions caused by a forced outage are included in these measures. For transmission equipment reliability performance, transmission system forced unavailability is used.

\(^1\) There are situations where a customer owns low voltage buses but these buses are still treated as Hydro One’s transmission Delivery Points.
Table 1:

Transmission Reliability Measures

<table>
<thead>
<tr>
<th>Reliability Perspective</th>
<th>Reliability Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability of Delivery of Electricity to Customers</td>
<td>Frequency of Delivery Point Interruptions</td>
<td>average number of interruptions experienced at delivery points</td>
</tr>
<tr>
<td></td>
<td>Duration of Delivery Point Interruptions</td>
<td>average interruption durations in minutes experienced at delivery points</td>
</tr>
<tr>
<td></td>
<td>Delivery Point Unreliability Index – a measure of unsupplied energy</td>
<td>energy not supplied to customers caused by interruptions, normalized by system peak load and presented in System Minutes</td>
</tr>
<tr>
<td>Reliability of Transmission Equipment</td>
<td>Transmission Equipment Unavailability</td>
<td>extent to which transmission equipment is not available for use by market participants due to forced outages</td>
</tr>
</tbody>
</table>

Hydro One uses these measures because:

- These are commonly used transmission reliability measures in industry to address transmission service quality perspectives important to customers and stakeholders.
- The benchmarking of these measures is meaningful as data collection and reporting practices among all CEA member utilities are consistent.
- These measures have been in place for over 10 years and it makes historical data available for assessing performance trends, setting targets and benchmarking.
- The limited number of measures keeps tracking and reporting requirements at a manageable and cost-effective level while still covering a broad transmission reliability performance spectrum.
A summary of delivery point performance according to the Hydro One Customer Delivery Point Performance (CDPP) Standards is discussed in Section 5.5. The standard, as attached in Appendix A, is described in a Hydro One exhibit previously filed with the OEB: Customer Delivery Point Performance (CDPP) Standard, EB-2002-0424. Appendix B provides definitions and detailed descriptions of these reliability measures. Appendix C provides historical performance of the measures as listed in Table 1.

5.3 Comparison of Hydro One Performance to Canadian Averages

Using data collected by the CEA, Hydro One is able to compare the reliability performance of its transmission system against Canadian average performance (CEA Composite). The comparison of delivery point reliability performance discussed in this section is at the system level that reflects the system average of all delivery points. Hydro One also focuses on multi-circuit supplied delivery point performance and that can be benchmarked with comparable Canadian utilities. In its efforts to achieve high performance, Hydro One establishes multi-circuit supplied delivery point performance targets in the first quartile ranking to comparable utilities in Canada.

Hydro One’s comparative reliability performance at the system level is illustrated in the following Figures 4, 5, 6 and 7 for frequency of momentary interruptions, frequency of sustained interruptions, duration of sustained interruptions and delivery point unreliability index respectively. The CEA composite data is only available up to 2012. Hydro One 2013 data is provided in graphs where available.

Special notes for July 8th, 2013 Greater Toronto Area (GTA) Flooding Event:

Following the new CEA reporting criteria, the July 8th GTA rain flooding event is classified as a “Degree 4 Severity” event due to the significant customer impact. The
criteria dictates that a local disturbance event will be treated separately when the total unsupplied energy caused by the event is more than 1 million MW-minutes. There was 1,406,218 MW-minutes unsupplied energy for July 8th event. The CEA generates two sets of numbers, with and without the event for load interruption related reliability measures. Such separation makes the performance comparison more meaningful among member utilities. The only two other events in the same category in the CEA transmission reliability reporting history were 1998 Eastern Ice Storm and 2003 Blackout. In order to have a meaningful comparison, all interruptions due to the July 8th event are excluded in this report.

Figure 4:
Comparison of Hydro One Frequency of Momentary Interruptions to CEA Composite

![Graph showing frequency of momentary delivery point interruptions from 2004 to 2013. The graph compares Hydro One and CEA Composite data. The x-axis represents years from 2004 to 2013, while the y-axis represents the average number of interruptions per delivery point. The graph highlights that results exclude the impact of the 2013 GTA Flooding.](image-url)
Figure 5:
Comparison of Hydro One Frequency of Sustained Interruptions to CEA Composite

Frequency of Sustained Delivery Point Interruptions

* Results exclude the impact of the 2013 GTA Flooding
Figure 6:
Comparison of Hydro One Duration of Sustained Interruptions to CEA Composite

Duration of Sustained Delivery Point Interruptions

* Results exclude the impact of the 2013 GTA Flooding

Figure 7:
Comparison of Hydro One Delivery Point Unreliability Index to CEA Composite

Delivery Point Unreliability Index

* Results exclude the impact of the 2013 GTA Flooding
Delivery point interruption duration is the most critical index of measuring delivery reliability. A list of major events that significantly contributed to this measure are provided:

- In July 2013, an intense summer storm with high winds, lightning and torrential downpours in southern central Ontario contributed 7.9 minutes of 2013 duration of delivery point interruption measure.
- In December 2013, just before Christmas, an icy winter weather condition in most of southern Ontario contributed 5.0 minutes to 2013 duration of delivery point interruption measure.
- In November 2013, Armitage Transmission Station had a switch failure that contacted two 230 kV circuits. As a result, 7 delivery points normally supplied by these two circuits were interrupted. The event contributed 3.5 minutes to 2013 duration of delivery point interruption measure.
- In 2012, a forest fire in Dymond area, Northern Ontario significantly impacted the performance of the Hydro One grid. The event contributed 40.4 minutes to 2012 duration of delivery point interruption measure.
- In 2011, a forest fire in Northwestern Ontario damaged several wood pole structures and significantly impacted the performance of the Hydro One grid. The duration of delivery point interruptions was increased from 58.5 to 127.9 minutes per delivery point.
- In 2006, the Caledonia Event contributed 8.5 minutes to the Duration of Delivery Point Interruption measure as shown.
- In 2006, ice storms and electric storms significantly impacted the performance of the Hydro One grid. The frequency of sustained delivery point interruptions was increased from 0.78 to 0.91 interruptions per delivery point (Figure 5) and the duration of delivery point interruptions was increased from 54.6 to 62.0 minutes per delivery point.
Transmission system forced unavailability is split into Unavailability of Transmission Lines and Unavailability of Transmission Station Equipment. Station equipment includes power transformers, circuit breakers and capacitor banks. The Unavailability measure represents the extent to which the major transmission equipment is not available for use within the system. The detailed description of this measure is provided in Appendix B for both categories. Figures 8 and 9 illustrate historical performance of Hydro One lines and station equipment as compared to the CEA Composite which is a 5-year moving average performance of all the CEA member utilities. Figure 8 shows an increase in Transmission Line Unavailability from 2009 to 2011. The Hydro One measure indicates significant improvement in 2012 and 2013. The CEA All Canada numbers show a decrease in performance in 2012. Figure 9 shows similar trend for major Station Equipment and relatively better performance in 2013.

**Figure 8:**
Unavailability of Transmission Lines

![Unavailability of Transmission Lines](image-url)
Performance of equipment is a leading indicator of system performance. Sustainment investments are made to preserve performance of critical asset groups by investing at the individual asset level and thereby preserving overall system performance.

Transmission system performance is one factor considered in the Hydro One Investment Plan Development (Exhibit A, Tab 16, Schedule 3) and in the Investment Prioritization Process (Exhibit A, Tab 16, Schedule 4).
5.4 Performance Relative to Utilities in the USA

In order to provide additional reliability comparisons, Hydro One also participates in a transmission line reliability benchmarking study in the U.S., administered by SGS, a utility consultancy. Hydro One’s delivery performance associated with transmission line outages are illustrated in Figures 10 and 11 below. The graphs show Hydro One’s relative quartile performance compared to other transmission companies in the SGS study. Although there are some inconsistencies in both definitions and reporting practices within the study utilities, the results are considered accurate enough for broad, system performance comparisons. The measures are system averages for frequency and duration of forced interruptions to transmission delivery points. Results are normalized by line length to facilitate the measurement comparison. The results indicate that for 230kV and above systems, Hydro One is generally performing in the second quartile within this study group.
Figure 10:
Delivery Point Outages per 100 miles for Delivery Points Served by ≥ 230kV

Notes:
(1) The quartile values are reported as part of the study results.
(2) Measures are system averages for frequency and include non-planned interruptions to transmission delivery points due to transmission line outages only.
Figure 11:
Delivery Point Outage Duration per 100 miles for Delivery Points Served by ≥ 230kV

Notes:
(1) The quartile values are reported as part of the study results.
(2) Measures are system averages for duration and include non-planned interruptions to transmission delivery points due to transmission outages only.
5.5 Delivery Point Performance Outliers

Delivery point performance is evaluated in accordance with the standard that Hydro One developed and filed with the OEB. The performance standard is used as a trigger by Hydro One to initiate assessment and follow up with affected customers in order to:

- Determine the root cause of unreliability;
- Perform technical and financial evaluations; and
- Decide on remedial action to improve reliability.

Figure 12 provides a summary of the transmission load delivery point performance outliers for the Group and Individual Customer Delivery Point Performance (CDPP) Standard criteria. Outliers due to Group and Individual CDPP Standard criteria are not mutually exclusive. This means that a delivery point can be both a group outlier and an individual outlier in same year.

2 Customer Delivery Point Performance (CDPP) Standard, EB-2002-0424
The delivery points found to continually be outliers according to the standard are incorporated into future investment programs. Hydro One endeavours to keep the number of outliers at 10% or less of the total population of delivery points. This will not always be the case as some delivery points are flagged as individual outliers even though they would normally experience better reliability performance than standard. One or two interruptions caused by isolated events may drive a specific delivery point as an individual outlier in a particular year. These delivery points would typically become a non-outlier in the following year with no incremental investment. Hydro One takes this into consideration in its assessments.
6.0 SHAREHOLDER PERFORMANCE

Delivering shareholder value is a key objective of any business and as such, Hydro One monitors related measures. A key measure in this area is the company’s credit rating. Currently the company has a credit rating in the “A” category, which is in line with other large transmission companies in Canada. The goal is to maintain this credit rating in order to ensure ready access to long-term financing at reasonable rates, as Hydro One does not have access to equity markets and must use debt to fund capital requirements and investments. Table 1 of Exhibit B1, Tab 2, Schedule 1 provides credit ratings of Hydro One Inc.

Maintaining a good credit rating allows Hydro One to borrow at attractive interest rates, which benefits customers by minimizing the cost of capital.