Ontario Energy Board | Commission de l'énergie de l'Ontario

BY EMAIL AND WEB POSTING

November 21, 2022

To: All Licensed Electricity Distributors
All Participants in Consultation Process EB-2021-0307
All Other Interested Parties

The Ontario Energy Board (OEB) is making improvements to its Reporting and Record-keeping Requirements (RRR) for electricity distributors as part of its reliability and power quality review initiative (RPQR).

On November 30, 2021, the OEB issued a letter launching its review of reliability and power quality in the Ontario electricity sector. The initial phase of RPQR has focused on the enhancement and improvement of reliability data reporting by distributors. This letter provides information regarding reliability data reporting improvements arising from the first phase of the RPQR and outlines the related amendments to the RRR (RRR amendments). Most of these changes come into effect January 1, 2023 with the first reporting of the data in April 2024.

The OEB established the RPQR working group, which includes consumer groups, distributors and a transmitter to provide input on technical issues and assist OEB staff in the development and implementation of reliability benchmarking, customer-specific reliability and reliability analytics. The RRR amendments, which have been informed by discussions with the RPQR working group, focus on increasing consistency in reporting through clarifying definitions, improving data quality and minimizing any additional regulatory requirements.

Through these consultations, with an understanding of the potential impact on distributors, the only new reporting requirements to be included in the RRR amendments are the sub-cause codes for power interruptions. Sub-cause code data is an area that RPQR members, including distributors, indicated would provide greater insight into the root cause of interruptions. This insight would, in turn, assist distributors in making targeted investments.

The RRR amendments are generally supported by the RPQR working group given the benefits for planning and recognition of the importance of providing customers with clear and meaningful reliability data. This is consistent with what customers told the OEB in

surveys[1]: that greater transparency regarding reliability performance is desired. The changes are also important to building the foundation for benchmarking that will encourage improved distributor performance, cost efficiency and developing new approaches to assessing distributors' investment plans.

Amendments to RRR

The focus of these RRR amendments is on increasing clarity in existing definitions with respect to reporting on loss of supply, major events and interruption cause codes. The only new requirement is the addition of sub-cause codes for interruption reporting. A summary of amendments related to each of the topic areas is provided below. The actual amendments are set out in Appendix A of this letter.

Definitions

As a first step of the RPQR working group discussions, members suggested reviewing key definitions related to reliability data reporting. In addition to the existing definition of "Interruption" in RRR, members discussed the definitions for "sustained interruption," "momentary interruption" and "outage." The definition of an "outage" is added to clarify that an outage may or may not cause an interruption of service to customers, depending on system configuration. For further clarity and consistency in reliability reporting, the RRR amendments include new definitions for "sustained interruption," "momentary interruption" and "outage" and replace the word "outage" with "interruption" in the cause codes and other sections in the RRR.

Loss of Supply

Accurate reporting of loss of supply related interruptions is important because these interruptions are excluded from distributors' reliability performance measurements on their scorecards. In the RRR, under section 2.1.4.2.5 loss of supply is defined as "problems associated with assets owned and/or operated by another party, and/or in the bulk electricity supply system."

It became evident through discussions at the RPQR working group that distributors have differing views about what qualifies as a loss of supply event. To provide greater clarity on this issue, the OEB is revising the definition of "loss of supply" by replacing the terms "another party" and "bulk electricity supply system" with "another distributor" and "transmission system." The OEB is also adding explanatory notes to the loss of supply definition to explain which events should be reported as loss of supply and which ones should not. The new definition will ensure greater consistency in how distributors report this information. Greater consistency will support customers in understanding the

[1] Non-residential customer survey result summary and Residential and business customer survey result summary.

reliability of their distributor's systems, including improvements in reporting on distributors' scorecards.

Major Event

A major event is defined in the RRR, under section 2.1.4.2, as "an event beyond the control of the distributor and is unforeseeable, unpredictable, unpreventable or unavoidable". These events are by their nature the most extreme and impactful events that customers experience. Similar to loss of supply, major event interruptions are excluded from distributors' reliability performance measurements on their scorecards.

Through a review of major events reported by distributors in the past, OEB staff has identified that distributors have had different views on what should be reported under the major event category. Following discussions on this issue at the RPQR working group, the OEB is making changes to the definition of a major event. The revised definition provides greater clarity on what should be reported as a major event by clearly excluding events that are within a distributor's control. The new definition is expected to lead to greater consistency in reporting by distributors given the impact that major events have on distributors' reliability reporting and scorecards. For example, if a tree branch comes into contact with energized circuits under normal weather conditions and causes a major interruption, the distributor should not report this event under the major event category because the event could have been mitigated through the distributor's vegetation program. The RPQR working group was supportive of the changes to this definition.

Interruption Cause Codes

Currently, distributors are required, under section 2.1.4.2.5 of the RRR, to report the number of customer interruptions and number of customer-hours of interruptions by primary cause codes, of which 10 have been defined. During the RPQR working group meetings, distributors identified that there has been inconsistent understanding of what fits under specific cause codes. To improve consistency in reporting, the OEB is amending all of the primary cause codes for greater clarity. For example, the definition for cause code 3 (Tree Contacts) has been revised to exclude interruptions caused by tree contacts under adverse weather condition, to differentiate the ones reported under cause code 6 (Adverse Weather).

Sub-Cause Codes

Through the RPQR working group discussions, it became evident that some distributors record interruptions using sub-cause codes developed by Electricity Canada for the purpose of its national utility benchmarking programs, in addition to the primary cause codes. Those distributors explained that they use sub-cause codes to better understand

the root cause of interruptions and, where appropriate, take steps to address the root cause. Members of the RPQR working group supported the inclusion of sub-cause code reporting in the RRRs.

The OEB agrees that a further breakdown of the primary cause codes into sub-cause codes will provide greater insight into the distributors' reliability performance and will assist distributors in making informed investment decisions based on the root causes of interruptions. For example, an interruption caused by a tree contacting power lines during normal weather conditions versus during adverse weather conditions would likely lead to different distributor actions and investment decisions. The OEB is therefore adding sub-cause codes to reliability reporting requirements. Many of the of the sub-cause codes being adopted are consistent with the ones used by Electricity Canada , which will permit distributors to rely on their current practices and to link the two sets of data for analysis. Consistent with the recommendation of the RPQR working group, the sub-cause codes requirement will come into force on January 1, 2024.

RPQR working group members have also discussed the potential impact of DERs on the reliability of the electricity system. While some members noted that DERs could enhance system reliability, some also raised concerns about the risks of increased penetration of DERs on system reliability. All members supported being more transparent about the impact of DERs on reliability. As supported by a number of members of the RPQR working group, the OEB is adding DERs to the definition of cause code 5 (Equipment Failure), 8 (Human Element) and 9 (Foreign Interference).

The RRR amendments to the Definitions, Loss of Supply, Major Events and Interruption Cause Codes come into force on January 1, 2023, with the first annual reporting due April 2024. RRR amendments to record sub-cause codes for interruptions will come into force on January 1, 2024, with reporting starting April 2025. A revised version of the RRR, reflecting the RRR amendments, will be issued in the near future.

If you have any questions regarding this letter, please contact Industry Relations at IndustryRelations@oeb.ca

Sincerely,

Brian Hewson

Digitally signed by Brian Hewson

Brian Hewson
Vice President, Consumer Protection and Industry Performance

Attachments: Appendix A — Amendments to the Electricity Reporting and Record-keeping Requirements

APPENDIX A

Amendments to Section 2.1.4.2 of the

Electricity Reporting and Record-keeping Requirements

November 21, 2022

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Note: Black underlined text indicates additions to the RRR and strikethrough text indicates deletions from the RRR.

Section 2.1.4.2 will be revised as follows:

2.1.4.2 Reporting on System Reliability Indicators

A distributor is required to monitor the reliability index information monthly and report for each month of the year. The following definitions apply for the purposes of monitoring and reporting on each of the system reliability indicators set out below:

Definitions:

2) An “Interruption” means the loss of electrical power, being a complete loss of voltage ~~of a duration of one minute or more,~~ to one or more customers, including planned interruptions scheduled by the distributor but excluding: part power situations, outages scheduled by a customer, interruptions by order of emergency services, disconnections for non-payment or power quality issues such as sags, swells, impulses or harmonics.

   Sustained interruption: means an interruption with a duration of one minute or more. Note: This excludes interruptions to a section of the feeder when the distributor is required to isolate the feeder section as a result of an order by emergency services.

   Momentary interruption: means an interruption with a duration of less than one minute. Note: These interruptions are generally restored by automatic reclosure facilities and are of a very short duration (on the order of a few seconds). If the reclosure operates multiple times within five minutes, and remain closed after that, it would be considered one momentary interruption. If the recloser operates multiple times and remains open after the operations, it would be considered a sustained interruption.

4) “Major Event” is defined as an event that is beyond the control of the distributor and is:
   a) unforeseeable;

b) unpredictable;
c) unpreventable; or
d) unavoidable.

Such events disrupt normal business operations and occur so infrequently that it would be uneconomical to take them into account when designing and operating the distribution system. ~~Such events~~ Distributors should only report events that cause exceptional and/or extensive damage to assets, ~~they~~ take significantly longer than usual to repair and ~~they~~ affect a substantial number of customers.

“Beyond the control of the distributor” means events that include, but are not limited to, force majeure events and Loss of Supply events.

When assessing whether a substantial number of customers were affected and whether it took significantly longer to restore service than normal, distributors shall follow the Canadian Electricity Association’s Major Event Determination Reference Guide. As set out in the Guide, distributors shall use one of the following approaches:

a) The IEEE Standard 1366 approach (preferred method);
b) The IEEE Standard 1366 approach, using a two-day rolling average; or
c) The fixed percentage approach (i.e., 10% of customers affected).

Distributors shall include all ~~outages~~ interruptions that ~~occurred during the Major Event, including those that may be unrelated to the event itself, but occurred at the same time.~~ were caused or impacted by the Major Event but exclude those that are unrelated to the event itself. For example, if a storm only impacted a portion of the distributor’s service area and resulted in a Major Event, interruptions in other portions of the distributor’s service areas should not be recorded under the same Major Event, unless the restoration time of these interruptions were impacted by the storm.

The distributor should include a scheduled interruption that started before the start time of the Major Event, or if it was directly related to the Major Event (such as the interruption was scheduled in order to repair/restore the interruptions caused by the Major Event). Distributors should not include a scheduled interruption that started after the start time of a Major Event.

Note: Generally, distributors should not report a Major Event if the root cause of the event is: unknown, a fallen tree or tree branch during normal weather or environment conditions, animal contact, a scheduled interruption, equipment failure or human element.

If the distributor is of the opinion that an event, caused by any of the root causes listed above, should be considered a Major Event due to special circumstances, it should seek the OEB’s guidance before reporting the interruptions under the

Major Event category.

5) "Outage" is defined as the loss of ability of a component to deliver power. An outage may or may not cause an interruption of service to customers, depending on system configuration.

6) "Loss of Supply" is defined as customer interruptions due to problems associated with the distribution system owned and/or operated by another distributor, and/or in the transmission system.

- Problems "in the Transmission system" include interruptions caused by assets owned and/or operated by transmitter and generation facilities that are connected to the transmission system.
- If the event was caused by problems associated with the distribution system owned and/or operated by the distributor, this distributor shall not report this event under loss of supply. Instead, the distributor must report the interruption based on the root cause (e.g., tree contact or equipment failure).
- If the root cause of the event cannot be determined, the interruption shall be reported under cause code "0 Unknown."
- If the root cause of the event was the failure of non-distributor owned electrical equipment, the distributor shall report this event under cause code "9 Foreign Interference."
- If the event was caused by Distributed Energy Resources (DERs), the interruptions will be reported under cause code "5 Equipment Failure," "8 Human Element" or "9 Foreign Interference" depending on the root cause and ownership of the DER(s).
- For the purpose of reliability reporting, DERs include embedded generation facilities and storage facilities.

2.1.4.2.5 Reporting Cause Codes

The changes to the primary cause codes come into force January 1, 2023..
For each Primary Cause of Interruption as set out below, a distributor shall, for each month, report the following data:

a) Name of the Cause of Interruption;
b) Number of interruptions that occurred as result of the Cause of Interruption;
c) Number of customer interruptions that occurred as a result of the Cause of Interruption; and
d) Number of customer-hours of interruptions that occurred as a result of the Cause of Interruption.

Reporting by sub-cause code comes into force January 1, 2024 . For each Sub-cause of interruption as set out below, a distributor shall, for each month, report the following data:

a) Name of the Cause of Interruption;
b) Number of interruptions that occurred as result of the Cause of Interruption;
c) Number of customer interruptions that occurred as a result of the Cause of Interruption; and
d) Number of customer-hours of interruptions that occurred as a result of the cause of interruption.

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
0		**Unknown~~/Other~~**	~~Customer interruptions~~ Interruption with no apparent cause ~~that contributed to the outage~~. If the interruption was caused by equipment failure and the distributor cannot determine the root cause of the failure, the interruption should be reported under code 5 (code 5.1).
1		**Scheduled ~~Outage~~**	~~Customer interruptions~~ Interruption due to ~~the~~ disconnection at a selected time for the purpose of construction or ~~preventive~~ maintenance. Scheduled interruption initiated by transmitter or host distributor should be reported under code 2. Secondary interruption that must be initiated in order to repair and/or restore a previous interruption or interruption initiated to allow for staged restorations should be reported under the root cause of the previous interruption. For example, if the distributor needs to interrupt load to switch a section of overhead line back into service following a car accident, this interruption should be attributed to code 9 (or code 9.2).
	1.1	Non-distributor activities	Interruption required to safely perform activity that is unrelated to the distributor's distribution system (i.e., road/bridge/building

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
			construction and movement of very large items, like buildings and bridge trusses, etc.).
	1.2	Distributor activities	Interruption required to allow the distributor to safely perform construction or maintenance activity. This includes a scheduled interruption for new builds or upgrade activities (for example, replacing a pole-mounted transformer, removing equipment), maintaining the distributor's distribution system and trimming trees.
2		**Loss of Supply**	~~Customer interruptions~~ Interruption due to problems associated with ~~assets owned and/or operated by another party~~ the distribution system owned and/or operated by another distributor, and/or in the ~~bulk electricity supply system. For this purpose, the bulk electricity supply system is distinguished from the distributor's system based on ownership demarcation.~~ transmission system. This cause code includes interruptions caused by transmitter or host distributor scheduled interruption.
	2.1	Loss of Supply Transmission	Problems in the transmission system or assets owned and maintained by the transmitter.
	2.2	Loss of Supply Distribution	Problems associated with the distribution system owned and/or operated by another distributor.
3		**Tree Contacts**	~~Customer interruptions~~ Interruption caused by faults resulting from tree contact with energized circuits under normal environment and weather conditions.
	3.1	Fallen tree on right-of-way	Entire or major portion of, or major trunk of a tree, where the base of the tree situated on

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
			distribution right-of-way or public right-of-way, that falls on an energized line or other distribution system equipment.
	3.2	Broken branch/tree growth/untrimmed tree	Branch breaks from tree and strikes lines or equipment, or tree growth causes damage to lines or equipment.
	3.3	Fallen tree off right-of-way	Entire or major portion of, or major trunk of a tree, where the base of the tree situated off distribution right-of-way or public right-of-way, that falls on an energized line or other distribution system equipment.
4		**Lightning**	~~Customer interruptions due to lightning striking the distribution system, resulting in an insulation breakdown and/or flash-overs.~~ The lightning category includes all interruptions caused by lightning. This may be by a direct strike contacting the wires or another piece of equipment, or by a lightning-induced flashover of the wires or to another piece of equipment.
5		**~~Defective~~ Equipment Failure**	~~Customer interruptions~~ Interruption resulting from ~~distributor equipment failures~~ the failure of distributor-owned equipment due to deterioration ~~from age~~, ~~incorrect~~ insufficient maintenance or ~~imminent failures detected by maintenance~~ defective equipment/material. Customer interruptions caused by DER equipment failure shall be reported under code 5 (code 5.2) if the DER is owned by the distributor. Scheduled interruption to repair/replace deteriorated equipment should be reported under code 1 (code 1.2). If the deteriorated equipment did not fail, however its condition required immediate interruption to repair/replace, the interruption

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
			should be reported under code 5 (code 5.1).
	5.1	Equipment failure	Any failure of distribution equipment resulting from deterioration or improper maintenance of the distribution equipment.
	5.2	Distributed Energy Resource (DER)* Failure	Any failure of a distributor-owned DER facility. Any failure of a customer-owned DER facility should be reported under code 9 (code 9.5)
	5.3	Defective equipment/material	Equipment/material was flawed in some way at the time of installation, which resulted in its failure substantially before expected end-of-life (for example, a manufacturer assembly defect or poor design of the equipment/material).
6		**Adverse Weather**	~~Customer interruptions~~ Interruption resulting from severe rain, ice storms, heavy snow, severe windstorm (90 kilometres an hour), extreme temperatures, freezing rain, frost, hail or other extreme weather conditions (exclusive of ~~Code 3 and~~ Code 4 ~~events~~). Adverse weather includes but is not limited to the following conditions: • Severe windstorm greater than 90 kilometres an hour. • Rain at zero degrees Celsius, resulting in freezing rain accumulating on conductors. • Ice or snow buildup on distribution equipment/lines.
	6.1	Tree contact weather	Fallen tree or tree branches due to adverse weather conditions. This cause code includes interruptions caused by equipment breakage as a result of fallen tree/tree branches.
	6.2	Equipment breakage	Equipment breakage or temporary malfunction due to adverse weather

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
			conditions.
	6.3	Other Adverse Weather	Interruption caused by adverse weather but did not involve tree contact or equipment breakage.
7		**Adverse Environment**	~~Customer interruptions~~ Interruption due to distributor equipment being subject to abnormal environments, such as salt spray, industrial contamination, humidity, corrosion, vibration, fire or flooding.
8		**Human Element**	~~Customer interruptions~~ Interruption due to the interface of distributor staff with the distribution system. Only interruptions caused by distributor staff should be reported under this cause code, including improper protection settings, improper system operation and improper construction & installation.
	8.1	Distributed Energy Resource (DER)	Interruption caused by improper connection and/or improper operation of DERs by the distributor. If the DER is not owned by the distributor, and the DER has been operated improperly by the customer or a third party, it should be reported under code 9 (code 9.5).
	8.2	Other Human Element	Any other human element.
9		**Foreign Interference**	~~Customer interruptions~~ Interruption ~~beyond the control of the distributor~~ caused by external factors, such as those caused by customer equipment, DERs not owned by distributors, animals, vehicles, dig-ins, vandalism, sabotage, ~~and~~ foreign objects and cybersecurity events.
	9.1	Wildlife	Interruption caused by contact with any form of wildlife.

Primary Cause Code	Sub-Cause Code	Cause Code Name	Description
	9.2	Vehicle	Motor vehicle accidents, which impacted distributor infrastructure.
	9.3	Dig-in	Interruption caused by contact with underground infrastructure (e.g., conductor in conduit, transformers in underground vaults) due to non-distributor excavation, whether a locate was provided or not.
	9.4	Customer equipment	Failure or improper operation of electrical equipment not owned by distributors (excluding DER equipment) that caused interruption to one or more customers. Fallen tree or tree branches on customer-owned line or equipment shall be reported under this cause.
	9.5	Distributed Energy Resource (DER)	Failure or improper operation of DER facilities not owned/operated by distributors.
	9.6	Human (non-distributor staff)	Interruption caused by the act of a person other than distributor staff. Including interruptions caused by agricultural or construction equipment, trespassing by non-distributor staff (e.g., when theft of copper occurs at a station), sabotage, terrorism, cybersecurity event, balloons, kites, sneakers, foreign object, etc.

* For the purpose of reliability reporting, DERs include embedded generation facilities and storage facilities.