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September 9, 2009

Ontario Energy Board
P. O. Box 2319
2300 Yonge Street, Suite 2700
Toronto, Ontario M4P 1E4

Attention: Ms. Kirsten Walli
Board Secretary

**RE: Initiative to Develop Electricity Distribution System Reliability Standards**
**Board File No.: EB-2010-0249**

Dear Ms. Walli:

Essex Powerlines Corporation (Essex) submits the following written responses and information requested from the Board's August 23, 2010 request for consultation. Essex's submission may assist in facilitating discussion at the stakeholder conference.

The responses are structured in the format of Attachment A "Questions to Discuss" from the Board's August 23, 2010 correspondence.

## Current Practices

- **In addition to SAIDI, SAIFI and CAIDI, what, if any, other system reliability measures do you use?**

Essex uses a form of Reliability Centred Maintenance (RCM) as another system reliability measure. Essex has an RCM database that divides the statistical data into asset specific indices and category specific failures. For example the asset specific indices divide each electrical distribution component into categories of large enough size to make the statistics meaningful. For example an overhead transformers failure rate can be divided into different categories including the transformer itself, transformer arrestor, transformer switch, transformer fuse, primary transformer connection, and secondary transformer connection.

The frequency and timing of distribution system equipment maintenance is an important factor in this balance. Predictive maintenance or sometimes called value based maintenance relies on organized statistical data in order to identify distribution system components that are more likely to have an in service failure. Analysis of the databases characterizes the number and severity of service interruptions.

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Analyzing this data shows a distinction in terms of outage duration and customer minutes off. RCM preserves system function, failure probabilities, and methods of reducing failure, economic or other measures. This translates into statistical data by distribution system components (i.e. underground secondary services). A number of methods can be used for facilitating planning.

Essex's form of RCM provides the follow benefits to planning:

- Prevents failures whose consequences are most serious
- Schedule Maintenance to avoid unnecessary maintenance
- Produces severity and importance for each component that has the most detrimental effect to reliability
- Answers the question "What is the consequence of a single event on the Distribution System?"

**The cost associated with each failure is used to predict future costs using failure trends**. RCM focuses on preventing failures whose consequences are most serious while Predictive Maintenance uses diagnostic methods to schedule maintenance in a timely manner. Integrating two streams of information along with Risk and Value produces an optimal strategy for spending.

The database collecting equipment failures and outages contains the codes recommended to be used by the OEB in the DRH.

- **Provide a detailed description of your methodology utilized to record SAIDI and SAIFI. Please include information such as:**
    - **The degree of use of automated event tracking from SCADA systems, as well as reliance on manual observations.**
    - **Whether planned outages are tracked separately.**
    - **The level of detail captured throughout a stepped restoration process to record the total customer duration impact.**

Essex has created an "Outage Management" system to report and track the information required for SAIDI and SAIFI. The system has some automation and some manual observations. All outages are tracked including planned outages and part power.

Essex does not have a SCADA system and is supplied from Hydro One Networks Inc. (HONI) as an embedded distributor. Essex has installed technology that can identify the location of faults and voltages that have gone to zero along all of the feeders from each transformer station. This assists Essex Operations Staff in dispatching crews in the correct location as all feeders are shared with HONI (some feeders are 20km long going from Essex territory to HONI territory back to Essex territory and then back into HONI territory) and also locating the faults quicker. HONI provides access to the breaker operations and times/duration through an online password protected system that assists Essex in getting feeder or station outage data accurate.

The system has the following capability in relation to an outage event:

1. outages occurs

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2. customer calls in – every customer that calls is recorded and the database time stamps the time of the call
3. this data once input notifies the operations department and they dispatch the closest worker(s) depending on the nature of the outage
4. once the problem is known the Operation Department creates a specific outage and links all the calls associated with this specific outage to it.
5. as power is restored the field workers record the **stepped restoration** including times(if applicable) by system nomenclature (i.e. switch, fuse). The field workers notify the Operations Office Staff with restoration times to update a prerecorded outage message, in case customers call again, and send an outage notification at intervals to Essex staff. All this information is recorded on a paper "Outage Form".
6. the completed paper outage form flows to an outage database administrator for input into the outage database system. The administrator determines the exact number of customers from Essex GIS (Geographical Information System) at each step in the restoration, enters the start time (usually based on first call) of outage and restoration times (worker observation is used to record this) from the form. There are checks in the system to make sure the customer call times are "inside" the outage timeframe. Other information is entered for OEB reporting categories, for the RCM, for the statistical data part of the system to analyze and promote assets that require replacement. See **Appendix 1** for an excerpt from the Outage Management system.

**Do you use system reliability performance results in planning, investment and maintenance expenditures, as well as establishing operation and maintenance procedures? Please explain.**

Essex uses all these results to carry out the items the Board has identified and more. This process is best described in Essex's **Asset Investment Strategy** which in included in Essex's **2010 OEB EDR Application** (Exhibit 2 Tab 4 Schedule 1 and Exhibit 4 Tab 1 Schedule 1 dated September 25, 2009) as it is very comprehensive in nature. A summary from Essex's **Asset Investment Strategy** is below. All these items use some form of the reliability performance results.

The Framework for Asset Management

- Risk Reduction
- Risk Assessments
- Optimize Spend based on Strategic Objectives
    - Public/Employee Safety
    - Environmental
    - Regulatory
    - Financial
    - Socia-Political Image
    - Legal
    - Service Quality
- Manage Asset Investment Plan as a Live Model (modifications to)
- Keep Reliability Centred Maintenance Statistics within Acceptable
- Severity/Importance Indices
- Meet Customer/Developer Requests
- Carry out Cyclical Planned Inspections/Preventative Maintenance & correct findings

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- Global Information System with asset information
- Statistical Data, analysis, and Forecasting Tools
- Allowable Capital funding
- Resource Planning – ensuring resources are available to implement the plan
- Load Flow model and Loading database

- **Do you identify and track the impacts of extraordinary events?**

Essex only tracks the cost impact of extraordinary events such as a tornado (in the Municipality of Leamington that touched down in the early morning hours on June 6, 2010) or ice storm (2001). These extraordinary events can be seen in the reliability indicators but do not always substantially affect the **annual** SAIDI, SAIFI, and CAIDI.

- **What other actions do you take to manage system reliability performance?**

When failure rates rise in one particular area of Essex's distribution territory, Risk Assessments are completed to determine if accelerated replacements or maintenance fit into the Asset Investment mix in the same year they are found. These assessments allow Essex to input these revisions into the Asset Investment Plan and rerun the Risk Reduction/ Optimize Spend based on Strategic Objectives. This re-evaluates the current Asset Investment Plan as a live model. This process is best described in Essex's **Asset Investment Strategy** which in included in Essex's **2010 OEB EDR Application** (Exhibit 2 Tab 4 Schedule 1 and Exhibit 4 Tab 1 Schedule 1 dated September 25, 2009).

If you have any questions, please feel free to contact me.

Yours truly,

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Appendix 1