



# 2015 Joint Action Agency and State Association Report for Sample Joint Action Agency

The eReliability Tracker Annual Reports were created by the American Public Power Association (APPA) to assist utilities in their efforts to understand and analyze their electric system. This particular report is intended for Joint Action Agency (JAA) or State Association (SA) subscribers and is customized to include statistics from the agency's member utilities. The report also includes distribution system reliability data aggregated across the country to provide a national basis for comparison.

The data used to generate this report reflect activity in the eReliability Tracker from January 1, 2015 to December 31, 2015. Note that if you currently do not have a full year of data in the system, this analysis may not properly reflect your utility's statistics since it only includes data recorded for your utility as of February 10, 2016; therefore, any changes made after that date are not represented in this report.

## I. General Overview

Reliability reflects historic and ongoing engineering investment decisions within a utility. Proper use of reliability metrics ensures that the utility is not only performing its intended function, but also is providing service in a consistent and effective manner. Even though the primary use of reliability statistics is for self-evaluation, utilities can use these statistics to compare with data from similar utilities. However, differences such as electrical network configuration, ambient environment, weather conditions, and number of customers served typically limit most utility-to-utility comparisons. Due to the diverse range of utilities that use the eReliability Tracker, this report endeavors to provide data for all of the utilities within the JAA to improve comparative analyses while reducing differences.

Since this report contains overall data for all utilities that use the eReliability Tracker, it is important to consider the effect that a particularly large or small utility can have on the rest of the data. To ease the issues associated with comparability, reliability statistics are calculated for each utility with their respective customer weight taken into account prior to being aggregated with other utilities. All utilities are equally weighted and all statistics are developed on a per customer basis.

The aggregate statistics displayed in this report are calculated from utilities that experienced more than two outages in 2015. Also, utilities that experienced no outages this year, or did not upload any data, will have None/Null values in their report for their utility-specific data and were not included in the aggregate analysis.

The aggregate statistics provided in the following sections of the report are based on outages from 175 utilities, all of which recorded more than two outages for 2015 during the time period of analysis.

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## II. IEEE Statistics

When using reliability metrics, a good place to start is with the industry standard metrics found in the IEEE 1366 guide. For each individual utility, the eReliability Tracker performs IEEE 1366 calculations for System Average Interruption Duration Index (SAIDI), System Average Interruption Frequency Index (SAIFI), Customer Average Interruption Duration Index (CAIDI), Momentary Average Interruption Frequency Index (MAIFI) and Average Service Availability Index (ASAI).

When collecting the necessary data for reliability indices, utilities often take differing approaches. Some utilities prefer to include information as detailed as circuit type or phases impacted, while others include only the bare minimum required. In all cases, the more details a utility provides, the more practical their analysis will be. The indices provided in this section can be used by a JAA/SA to better understand the performance of their members' electric systems relative to other utilities nationally and to others within their membership.

It is important to note that the time when the outage ended is not required in case the outage is ongoing; therefore, outages without end dates at the time of the report analysis are not included in the indices that measure duration, such as SAIDI and CAIDI. However, they are included in the calculations measuring interruption frequencies, such as SAIFI or MAIFI, as well as in the analysis of outage causes.

Due to the differences in how some utilities analyze major events (MEs) relative to their base statistics, it is important to note how they are calculated and used in this report. An example of a major event could be severe weather, such as a tornado or thunderstorm, which can lead to unusually long outages in comparison to your distribution system's typical outage. In the eReliability Tracker and in this report, the APPA major event threshold is used, which is a calculation based directly on outage events, rather than event days. The major event threshold allows a utility to remove outages that exceed the IEEE 2.5 beta threshold for events. The threshold takes into account the utility's past outage history up to 10 years in order to make this calculation. In the eReliability Tracker, if a utility does not have at least 36 outage events prior to the year being analyzed, no threshold is calculated; therefore, the field showing the utility's major event threshold (MET) will be blank and the SAIDI calculations excluding MEs will be the same as the calculations with MEs for that utility. More outage history will provide a better threshold for your utility.

## IEEE Statistics

Utility	ME Threshold	SAIDI	SAIDI (no MEs)	SAIFI	CAIDI	MAIFI	ASAI
Carrolton Public Utilities	35.046	34.327	34.327	0.296	115.947	0.000	99.994
Johnston City Electric Department		75.984	75.984	4.212	55.541	0.000	99.985
Murphy Public Utilities	5.658	2.456	2.456	1.082	35.285	0.000	99.998
Town of Landover	9.353	108.766	18.047	1.021	189.460	0.000	99.960
Utilities Board of Ruthersburg	29.131	20.467	20.467	2.457	45.625	0.000	99.984
<b>Average for JAA/SA Member Utilities:</b>	<b>N/A</b>	<b>48.4</b>	<b>30.256</b>	<b>1.814</b>	<b>88.372</b>	<b>0</b>	<b>99.984</b>
<b>National Averages (all users of the eReliability Tracker):</b>	<b>N/A</b>	<b>97.015</b>	<b>42.321</b>	<b>0.736</b>	<b>113.665</b>	<b>0.181</b>	<b>99.982</b>

## II. Outage Causes

Equipment failure, extreme weather events, wildlife and vegetation are some of the most common causes of electric system outages. However, certain factors, such as regional weather and animal/vegetation patterns, can make a different set of causes more prevalent to a specific group of utilities. The following sections of this report include graphs depicting common causes of outages for each of your member utilities and all utilities using the eReliability Tracker.

The charts containing aggregate information are customer-weighted to account for differences in utility size for a better analytical comparison. For example, a particularly large utility will have a large number of outages compared to a small utility; in order to not have the collective information be more representative of the large utility, the number of occurrences is divided by customer size to account for the differences. In the figures below, the data represent the number of occurrences for each group of 1000 customers. For instance, a customer-weighted occurrence rate of "1" means 1 outage of that outage cause per 1000 customers on average in 2015.

Note that the sustained outage cause analysis is more comprehensive than the momentary outage cause analysis due to a bigger and more robust sample size for sustained outages. Regardless, tracking both sustained and momentary outages helps utilities understand and reduce outages. To successfully use the outage information tracked by your utility, it is imperative to classify and record outages in detail. The more information provided per outage, the more conclusive and practical your analyses will be.

### Sustained Outage Causes

In general, sustained outages are the most commonly tracked outage type. In many analyses of sustained outages, utilities tend to exclude scheduled outages, partial power, customer-related problems, and qualifying major events from their reliability indices calculations. While this is a valid method for reporting, these outages should be included for internal review to make utility-level decisions. In this section, we evaluate common causes of sustained outages for each of your members and for all utilities that use the eReliability Tracker. It is important to note that in this report, sustained outages are classified as outages that last longer than five minutes, as defined by IEEE 1366.

## Sustained Outages Cause Analysis

Utility	Cause 1		Cause 2		Cause 3	
Carrolton Public Utilities	Squirrel	16.901	Unknown/Other	5.070	Tree	4.789
Johnston City Electric Department	Tree	10.390	Squirrel	5.844	Equipment Worn Out	1.948
Murphy Public Utilities	Unknown	0.606	Tree	0.454	Squirrel	0.454
Town of Landover	Tree	5.516	Electrical Failure	2.691	Unknown	1.480
Utilities Board of Ruthersburg	Equipment	3.527	Tree	2.367	Electrical Failure	1.600
<b>National Top Causes (All Users of the eReliability Tracker):</b>	<b>Tree</b>	<b>1.351</b>	<b>Equipment</b>	<b>0.981</b>	<b>Squirrel</b>	<b>0.962</b>

## **Momentary Outage Causes**

The ability to track momentary outages can be difficult or unavailable on some systems, but due to the hazard they pose for electronic equipment, it is important to track and analyze their causes. In this section, we evaluate common causes of momentary outages for each of your members as well as for all utilities that use the eReliability Tracker. Utilities with less than eight momentary outages recorded in the eReliability Tracker as of February 10, 2016 are not included in the following analysis of momentary outage causes. Please note that only outages lasting less than five minutes are classified as momentary, as defined by IEEE 1366.

## Momentary Outages Cause Analysis

Utility	Cause 1		Cause 2		Cause 3	
Carrolton Public Utilities	None	0.000	None	0.000	None	0.000
Johnston City Electric Department	None	0.000	None	0.000	None	0.000
Murphy Public Utilities	Contact with Foreign Object	0.221	Ice	1.569	Squirrel	0.915
Town of Landover	None	0.000	None	0.000	None	0.000
Utilities Board of Ruthersburg	Squirrel	0.088	Failure of Greater Transmission	0.671	Storm	0.014
<b>National Top Causes (All Users of the eReliability Tracker):</b>	<b>Unknown</b>	<b>0.162</b>	<b>Utility Maintenance and Repairs</b>	<b>0.045</b>	<b>Customer Service</b>	<b>0.044</b>

Thank you for using the eReliability Tracker. We hope this report is useful in doing a system reliability benchmarking analysis for your membership. If you have any questions regarding the material provided in this report, please contact:

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The eReliability Tracker was funded by a grant from the Demonstration of Energy & Efficiency Developments (DEED) Program.



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**SAMPLE REPORT DATA**



