

# eReliability Tracker Service: User Training and Updates

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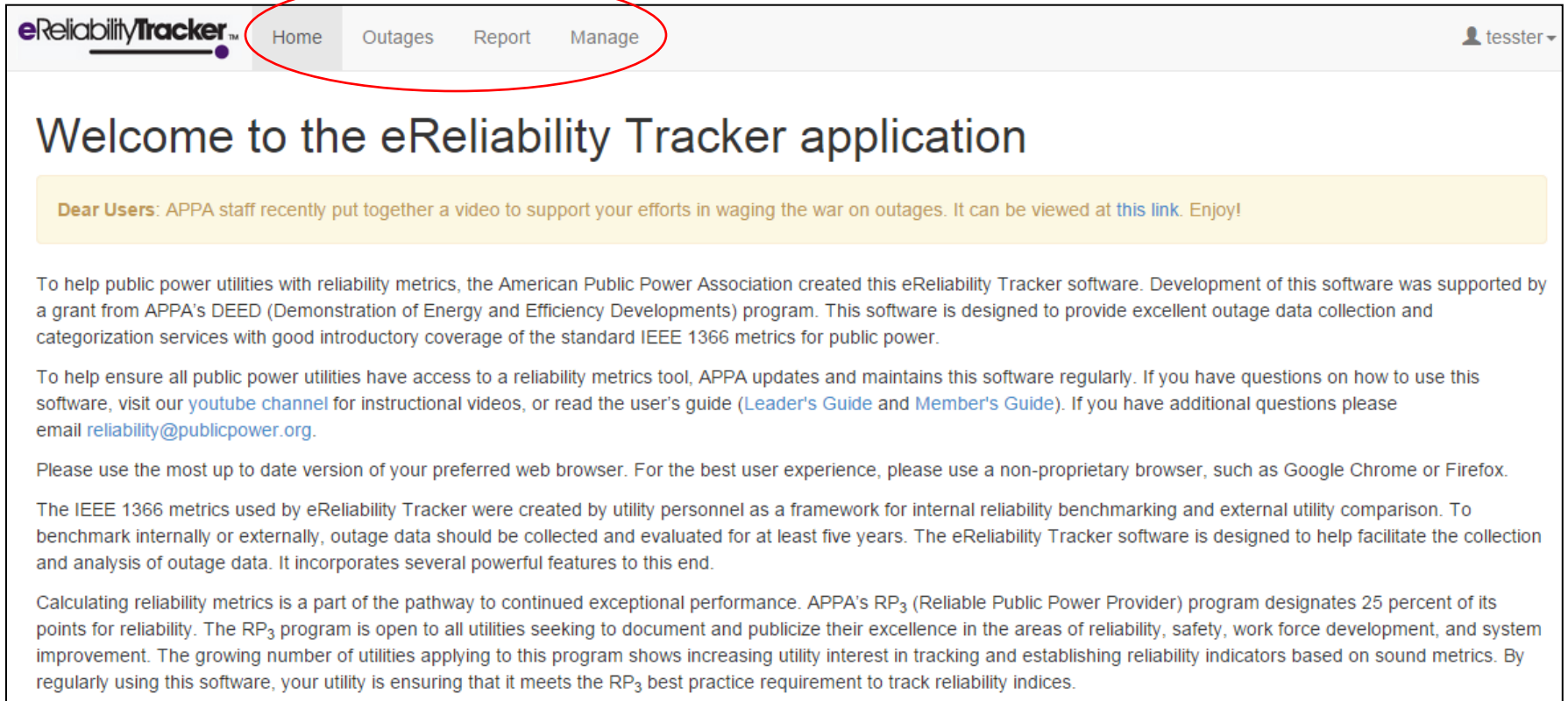


# Overview

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- Setup Utility Info
- Enter Outages
- Run Reports

# Home Page



eReliabilityTracker™ Home Outages Report Manage tesster

## Welcome to the eReliability Tracker application

**Dear Users:** APPA staff recently put together a video to support your efforts in waging the war on outages. It can be viewed at [this link](#). Enjoy!

To help public power utilities with reliability metrics, the American Public Power Association created this eReliability Tracker software. Development of this software was supported by a grant from APPA's DEED (Demonstration of Energy and Efficiency Developments) program. This software is designed to provide excellent outage data collection and categorization services with good introductory coverage of the standard IEEE 1366 metrics for public power.

To help ensure all public power utilities have access to a reliability metrics tool, APPA updates and maintains this software regularly. If you have questions on how to use this software, visit our [youtube channel](#) for instructional videos, or read the user's guide ([Leader's Guide](#) and [Member's Guide](#)). If you have additional questions please email [reliability@publicpower.org](mailto:reliability@publicpower.org).

Please use the most up to date version of your preferred web browser. For the best user experience, please use a non-proprietary browser, such as Google Chrome or Firefox.

The IEEE 1366 metrics used by eReliability Tracker were created by utility personnel as a framework for internal reliability benchmarking and external utility comparison. To benchmark internally or externally, outage data should be collected and evaluated for at least five years. The eReliability Tracker software is designed to help facilitate the collection and analysis of outage data. It incorporates several powerful features to this end.

Calculating reliability metrics is a part of the pathway to continued exceptional performance. APPA's RP<sub>3</sub> (Reliable Public Power Provider) program designates 25 percent of its points for reliability. The RP<sub>3</sub> program is open to all utilities seeking to document and publicize their excellence in the areas of reliability, safety, work force development, and system improvement. The growing number of utilities applying to this program shows increasing utility interest in tracking and establishing reliability indicators based on sound metrics. By regularly using this software, your utility is ensuring that it meets the RP<sub>3</sub> best practice requirement to track reliability indices.

# Manage Tab

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- Users in the system
- Circuit and substation information
- Equipment and custom variable list
- Key accounts

# Manage Tab – User Overview

Utilities **Users**

Bulk Actions ▾ Search:

[+ Create New User](#)

Select	Username	Utilities	Role	Last Login
<input type="checkbox"/>	ultraReliable	TESST APPA Utility	Member	Wed, 07 May 2014 19:29
<input type="checkbox"/>	mdcotetest	TESST APPA Utility	Leader	Thu, 01 May 2014 19:02
<input type="checkbox"/>	MSuddleson	TESST APPA Utility	Leader	Wed, 09 Apr 2014 20:49
<input type="checkbox"/>	tesster	TESST APPA Utility	Leader	Wed, 19 Nov 2014 03:38
<input type="checkbox"/>	alexhof	TESST APPA Utility	Leader	Tue, 29 Jul 2014 02:58

If you are a leader, you will have access to all user accounts for your utility.

The far right column shows when the user last logged into the system.

# Manage Tab – Edit User Information

Utilities Users

Home / Users / Edit User

## Edit User

Email:

Username:

Password:

Confirm Password:

Requires Password Reset?

Role:

Utilities:

Receive email communications related to eReliability Tracker?

Is Point of Contact

Timezone Offset:

If you are a leader, toggle this button to require your user to reset their password during their next login attempt.

If you have a Joint Action Agency account, this is where you can add or take away your users' access to your utilities.

Select to receive email updates on the tracker here. You can opt-in or out anytime.

# Manage Tab - Adding Users

## Create New User

Email:

Username:

Password:

Confirm Password:

Role:

Utilities  
-----  
TESST APPA Utility

Receive email communications related to eReliability Tracker?

Is Point of Contact

Timezone Offset:

Create User

Cancel

## Registering a new User

You can create a new user by filling out the screen to the left. Alternatively you can generate a registration link that allows a user fill out the form themselves. If you would like to generate a registration link, please complete the form below:

Role:

Utilities  
-----  
TESST APPA Utility

Create Registration

There are 3 roles, or types of users, in the tracker:

- Leader
- Member
- Spectator

Each role has a different set of permissions. You can have as many users as you like in each role.

# Manage Tab – Utility Overview

The screenshot shows the eReliabilityTracker interface. At the top, the 'Manage' tab is active. Below it, the 'Utilities' tab is highlighted with a red circle. The page contains a table with the following data:

Select	Name	Total Customers
<input type="checkbox"/>	TESST APPA Utility	22000

Below the table, it says 'Showing 1 to 1 of 1 entries'. Navigation arrows for 'Previous' and 'Next' are also present.

- Select the Utilities tab to see your utilities.
- If you are a JAA, you will see multiple utilities listed.
- If you are a single utility user, this will list your utility only.

This shows the current number of total customers served entered for the utility.



# Manage Tab – Edit Utility

## Edit Utility

**Name:**

**Address:**

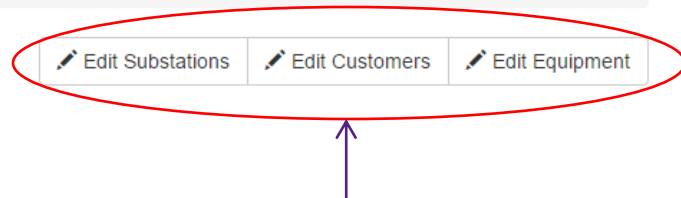
**City:**

**State:**

**Zip Code:**

**Total Customers:**

**Note on Total Customers:** The number of customers served by the utility must be entered correctly and updated as needed. This number is used for outage-related reports.



From this page, you can edit substations, customers, and the equipment list.

← Enter the total number of customers your utility serves here. This value is used in the reporting analysis so it is important to maintain!

# Manage Tab – Adding / Editing Substations

Select ▲	Substation	Circuit
<input type="checkbox"/>	North Substation	Circuit 2
<input type="checkbox"/>	North Substation	NS Circuit 1
<input type="checkbox"/>	North Substation	NS Circuit 1 Gold Hill
<input type="checkbox"/>	South Substation	Circuit 4
<input type="checkbox"/>	South Substation	Circuit 3
<input type="checkbox"/>	Central Substation	Circuit 5
<input type="checkbox"/>	East Substation	None
<input type="checkbox"/>	outage master	None

Showing 1 to 8 of 8 entries ◀ Previous Next ▶


Select the substation or circuit to edit either name.

# Manage Tab – Adding/Editing Substations

Utilities Users

Home / Utilities / TESST APPA Utility / Substations / Edit Substation

## Edit Substation

 Edit Circuits

Name:

eReliabilityTracker™ Home Outages Report Manage

Utilities Users

Home / Utilities / TESST APPA Utility / Substations / New Substation

## New Substation

Name:

# Manage Tab – Adding/Editing Circuits

Utilities Users

Home / Utilities / TESST APPA Utility / Substations / North Substation / Circuits

Bulk Actions ▾ Search: + Create New Circuit

Select ▲	Name
<input type="checkbox"/>	NS Circuit 1
<input type="checkbox"/>	Circuit 2
<input type="checkbox"/>	NS Circuit 1 Gold Hill

Showing 1 to 3 of 3 entries ◀ Previous Next ▶

eReliabilityTracker™ Home Outages Report Manage

Utilities Users

Home / Utilities / TESST APPA Utility / Substations / Central Substation / Circuits / Edit Circuit

## Edit Circuit

Name:

Total Customers Served:

# Customers per Circuit

Manage > Utilities > Utility A > Manage Customers

Bulk Actions ▼		Search:	+ Create New	
Select	Name	# Customers		
<input type="checkbox"/>	Circuit 1	5		
<input type="checkbox"/>	Circuit 2	7		

- Helps speed up the process of determining the total number of customers out when there is an outage.
- This will auto-populate the “Customers Out” field in the outage form based on the circuit selected.

### New Outage for Tesst Features Utility

Location of Outage	Details of Outage
Address: <input type="text"/>	Number of customers without power: <input type="text"/>
Substation: <input type="text"/>	Time outage began (Use military time): <input type="text"/>
Circuit: <input type="text"/>	Date outage began: <input type="text"/>
Cause of Outage	Time outage ended (Use military time): <input type="text"/>
Primary Cause: <input type="text"/>	Date outage ended: <input type="text"/>

# Customers per Circuit

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Keep in mind that...

- **If the user only selects a substation** (no circuit selected), the system will add the customers across all circuits for that substation and auto-populate the total customers field.
- **If the user only selects a circuit** (no substation selected), the system will populate the field with the number of customers on that circuit. The substation field will also be populated with the appropriate substation name.
- **If you manually enter a value into the field**, the auto-calculation aspect of this feature will be disabled.
- **If a user views or edits an existing outage** the auto-fill feature will be off (regardless of whether the user manually entered the original value or not).

# Manage Tab – Adding / Editing Customers

Utilities

Users

Home / Utilities / Edit Utility

## Edit Utility

Edit Substations

Edit Customers

Edit Equipment

Name: TESST APPA Utility

Address: 1875 Connecticut Ave, NW, Suite 1200

City: Washington

State: District Of Columbia

Zip Code: 20009

Total Customers: 22000

**Note on Total Customers:** The number of customers served by the utility must be entered correctly and updated as needed. This number is used for outage-related reports.

Update Utility

Cancel

# Manage Tab – Adding/Editing Customers

Utilities **Users**

Home / Utilities / TESST APPA Utility / Customers

Bulk Actions Search: ➕ Create New Customer

Select	Name	Address
<input type="checkbox"/>	Universal South Building	1845 Connecticut Ave, NW

Showing 1 to 1 of 1 entries

◀ Previous Next ▶

The customers entered here show up in the outage form for your utility to help keep track of outages on key accounts.

Miscellaneous Details

Key accounts without power:

How was the

eReliabilityTracker™ Home Outages Report **Manage**

Utilities **Users**

Home / Utilities / TESST APPA Utility / Customers / New Customer

### New Customer

Classification: commercial

Name: Children's Hospital

Address: 3453 Health Ln

Create Customer Cancel



# Manage Tab – Edit Equipment/Custom Variables

Utilities

Users

Home / Utilities / Edit Utility

Edit Substations

Edit Customers

Edit Equipment

## Edit Utility

Name: TESST APPA Utility

Address: 1875 Connecticut Ave, NW, Suite 1200

City: Washington

State: District Of Columbia

Zip Code: 20009

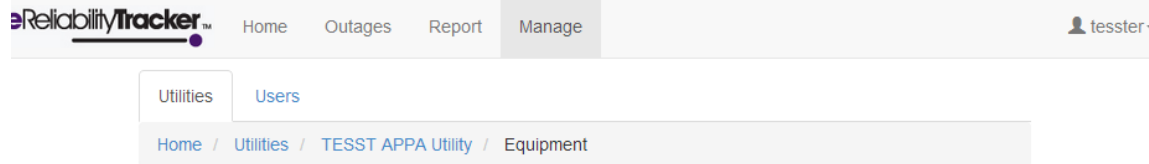
Total Customers: 22000

**Note on Total Customers:** The number of customers served by the utility must be entered correctly and updated as needed. This number is used for outage-related reports.

Update Utility

Cancel

# Manage Tab – Edit Equipment/Custom Variables

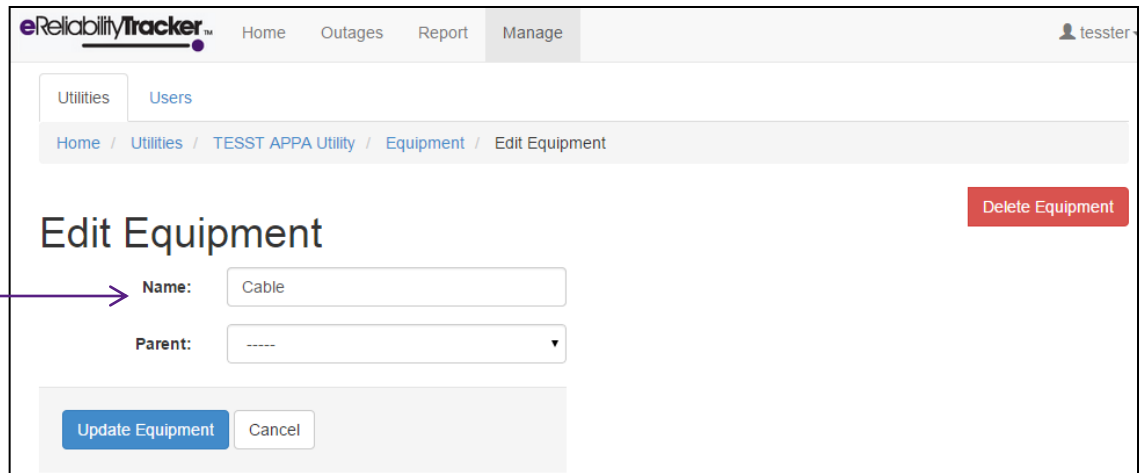


## Manage Equipment

- Cable
  - Direct Buried
  - Encased in Pipe or Conduit
- Connector
  - Connectors
  - Insulinks
  - Other Connector Equipment
  - Splices
- Control
  - Meters
  - Other Control Equipment
  - Relays
- Insulated Transition
  - Bushings
  - Insulators
  - Other Insulated Transition Equipment
  - Polymeric Terminations
  - Potheads
  - Separable Connectors
  - Stress Relief Cones
- Interrupting Device
  - Circuit Breaker

➕ Create New Equipment   ➕ Import Equipment CSV

Select an item to either edit the name, make it a child to a parent item, or delete.



# Outage Tab

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- Entering outages
- Selecting the right cause
- Grouping select outages into events
- Importing/exporting data

# Outage Tab – Creating an Outage

## New Outage for TESST APPA Utility

### Location of Outage

Address:	1310 Rhode Island Ave NW
Substation:	North Substation
Circuit:	NS Circuit 1

### Details of Outage

Number of customers without power:	228
Time outage began (Use military time):	20:20:00
Date outage began:	05/23/2015
Time outage ended (Use military time):	04:33:00
Date outage ended:	5/24/2015

### Cause of Outage

Primary Cause:	Utility Maintenance and Repairs
----------------	---------------------------------

Create Outage Cancel

### System Characteristics

Descriptive characteristics:	-----
System voltage at site:	-----
Circuit Type:	-----
Phases impacted:	-----

### Miscellaneous Details

Key accounts without power:	----- East Building North building South Building Unlabeled South Building
How was the outage reported:	-----
Total work hours to complete restoration:	0

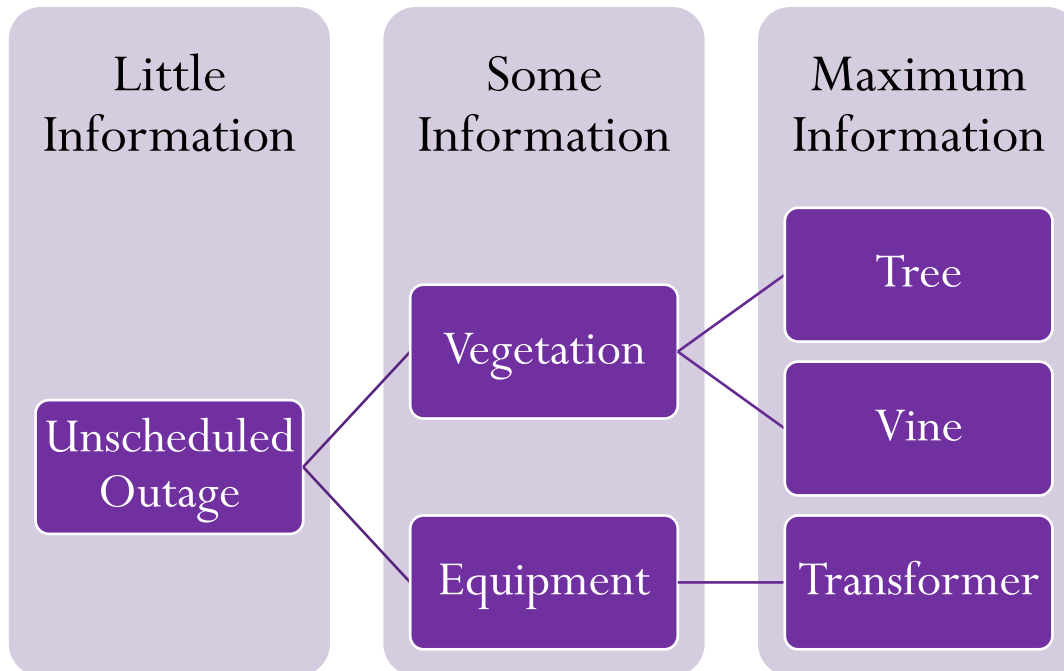
Those in RED are required fields

Basic Outage Form

# Reliability – Getting to the Right Outage Cause

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- **Always** try to select the cause that *most directly caused the outage* and will help the utility make improvements in the future.
  - For example, if a wind storm knocks a tree onto the line, ‘tree’ is the cause.
  - Select a cause that represents your level of available information.



# Outage Tab – Creating an Outage

## System Characteristics

Descriptive characteristics:	Generation
System voltage at site:	12000Y/6930
Circuit Type:	Secondary Selective
Phases impacted:	2 (B)
Load Interrupted (in KVA):	0

## Miscellaneous Details

Key accounts without power:	----- East Building North building South Building Universal South Building
How was the outage reported:	Outage Management System
Total work hours to complete restoration:	0
Total Customers Served:	22000

System Characteristics and Miscellaneous Details

## Work Details & Custom Variables

Work Detail: 1	Delete
Equipment Action:	Work Detail
Equipment:	-----
Notes:	Marked as "partial restoration".

Additional Details and Custom Variables

Add New Equipment Detail

Add more variables here

Create Outage

Cancel

# Outage Tab – Work Details & Custom Variables

## Work Details & Custom Variables

**Work Detail: 1** Delete

**Equipment Action:** Restoration

**Equipment:** Fuse

**Notes:**

Restoration is for tracking equipment and information related to the protective systems that operated to prevent damage or outages along the electrical network. Select restoration to record how protective equipment operated and was treated to reenergize customers after an interruption.

**Restoration Notes:** Replaced Fuse

Did protection equipment operate properly? (Check if yes)

**Number of operations of protective equipment:** 1

**Work Detail: 2** Delete

**Equipment Action:** Work Detail

**Equipment:** -----

**Notes:** Marked as "partial restoration".

This drop-down list is pulled from your Equipment and Custom Variable List.

Customize the list to fit your utility's needs.

# Outage Tab – Creating an Event

Bulk Actions ▾ Search:  + Create New Outage

- Group Selected Outages Into Single Event**
- Select Visible Outages
- Select All Outages
  
- Delete Selected Outages

	Utility	Substation	Circuit	Customers Out	Start Date	Duration (Minutes)
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 2	228	09/05/2013	497.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 2	368	09/05/2013	497.0
<input checked="" type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 2	189	09/05/2013	497.0
<input checked="" type="checkbox"/>	TESST APPA Utility	South Substation	Circuit 3	2	09/05/2013	1185.0
<input checked="" type="checkbox"/>	TESST APPA Utility	South Substation	Circuit 3	333	09/05/2013	75.0
<input checked="" type="checkbox"/>	TESST APPA Utility	South Substation	Circuit 3	12	09/05/2013	75.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 1	416	08/27/2013	45.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 2	983	08/27/2013	45.0
<input type="checkbox"/>	TESST APPA Utility	South Substation	Circuit 4	1	08/26/2013	120.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 1	20	07/15/2013	29.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 2	30	07/13/2013	79.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 1	8	07/13/2013	90.0
<input type="checkbox"/>	TESST APPA Utility	North Substation	Circuit 1	10	07/13/2013	64.0
<input type="checkbox"/>	TESST APPA Utility	Central Substation	Circuit 5	50	07/13/2013	82.0
<input type="checkbox"/>	TESST APPA Utility	South Substation	Circuit 3	1	07/12/2013	40.0

NOTE: A single outage itself is recorded as an event in the tracker.



# Outage Tab – Creating an Event

The screenshot shows the eReliabilityTracker interface. At the top, there is a navigation bar with the logo and menu items: Home, Outages (selected), Report, and Manage. A user profile icon for 'tesster' is visible on the right. Below the navigation bar, there are tabs for 'Record Outage', 'Outages', 'Events', 'Export', and 'Import'. The 'Events' tab is currently active. Below the tabs, there is a 'Bulk Actions' dropdown menu and a search input field labeled 'Search:'. The main content area displays a table of outages with the following columns: Select, Name, Outages Involved, and Start Date. The table contains 15 rows of data, each representing an outage with a checkbox, a name, a count of outages involved, and a start date.

Select	Name	Outages Involved	Start Date
<input type="checkbox"/>	Marty Test Outages	2	01/01/2015
<input type="checkbox"/>	2451 Crystal Drive	1	08/31/2014
<input type="checkbox"/>	2032 Belmont Rd	1	05/03/2014
<input type="checkbox"/>	1875 Connecticut Ave, NW, Suite 1200	2	01/01/2014
<input type="checkbox"/>	2900 K St NORTHWEST	1	09/05/2013
<input type="checkbox"/>	1330 MASSACHUSETTS Ave NORTHWEST	1	09/05/2013
<input type="checkbox"/>	1310 RHODE ISLAND Ave NORTHWEST	1	09/05/2013
<input type="checkbox"/>	2735 OLIVE St NORTHWEST	1	09/05/2013
<input type="checkbox"/>	2735 OLIVE St NORTHWEST	1	09/05/2013
<input type="checkbox"/>	751 P St NORTHWEST	1	09/05/2013
<input type="checkbox"/>	2501 PENNSYLVANIA Ave NORTHWEST	1	08/27/2013
<input type="checkbox"/>	2500 Q St NORTHWEST	1	08/27/2013
<input type="checkbox"/>	2900 K St NORTHWEST	1	08/26/2013
<input type="checkbox"/>	1718 P St NORTHWEST	1	07/15/2013

-NOTE: A single outage itself is recorded as an event in the tracker.

-Enhancements for grouping together outages into events are in-progress.

# Outage Tab – Editing an Event

Record Outage Outages **Events** Export Import

Home / Events / Edit Event

## Edit Event

Name:

Cause Type  Single-Cause Event  
 Multi-Cause Event

Update Event

Cancel

## Outages for this Event

An event with multiple outages is treated as one interruption for the purposes of reliability statistics (i.e. an event is a series of partial restorations).

Bulk Actions ▾

Search:

Select	Address	Substation	Circuit	Cause ⓘ	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	1875 Connecticut Ave, NW, Suite 1200	Central Substation	Circuit 5	Utility Human Error ✓	10	01/01/2014 08:00:00	No
<input type="checkbox"/>	1875 Connecticut Ave, NW, Suite 1200	Central Substation	Circuit 5	Lightning	5	01/01/2014 09:00:00	Yes

Showing 1 to 2 of 2 entries

Previous 1 Next

**\*NEW\***

*Customer Interruptions* based on outages marked as partial restoration

Customer Interruptions **10**  
Customer Minutes of Interruption **750.0**

# Causes Pie Chart

eReliabilityTracker™ Home Outages Report Manage tesster

IEEE 1366 Statistics SAIDI CAIDI SAIFI Outage Causes Circuit Ranking Cause Pie Chart

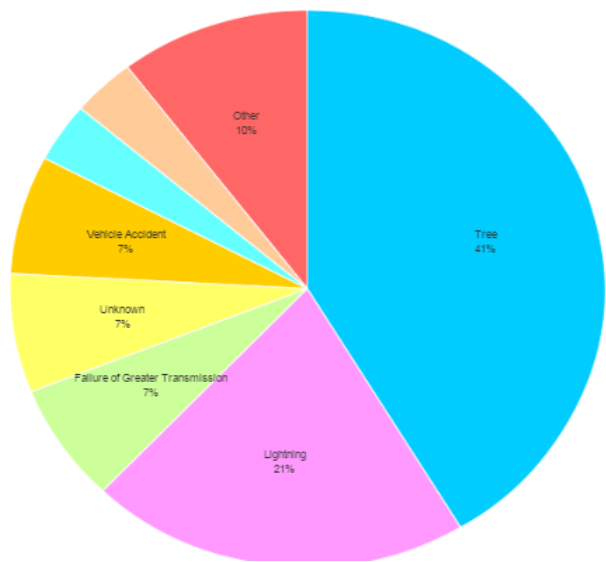
Start Date: 01/01/2013  
End Date: 12/31/2013  
Top-level Cause: ---

Substation: ---  
Circuit: ---

Report on Outage:  Count  Duration

Print Download to CSV Generate Report

This toggle button allows you to either rank the causes by count or by duration.



Outage Cause	Count	View
Tree	12	👁
Lightning	6	👁
Failure of Greater Transmission	2	👁
Unknown	2	👁
Vehicle Accident	2	👁
Equipment Damage	1	👁
Equipment Worn Out	1	👁
Overloaded	1	👁
Squirmel	1	👁
Equipment	1	👁
<b>Total</b>	<b>29</b>	

# Multiple vs Single Cause Events

Record Outage Outages Events Export Import

Home / Events / Edit Event

## Edit Event

Name:

Cause Type  Single-Cause Event  Multi-Cause Event

Update Event Cancel

## Outages for this Event

Bulk Actions ▾

Search:

Separate Selected Outages Into Unique Events

Set 'Is Part of Restoration' to 'Yes'

Set 'Is Part of Restoration' to 'No'

Delete Selected Outages

	Station	Circuit	Customers Out	Start Date	Is Part of Restoration?	
<input type="checkbox"/>	Substation	Circuit 3	100	01/01/2015	No	
<input type="checkbox"/>	Substation	Circuit 3	100	01/01/2015	Yes	
<input type="checkbox"/>	PR feature	South Substation	Circuit 3	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 4- To test PR feature	North Substation	Circuit 2	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 5- To test PR feature	North Substation	NS Circuit 1	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 6- To test PR feature	North Substation	NS Circuit 1	50	01/01/2015	Yes

Showing 1 to 6 of 6 entries

◀ Previous Next ▶

When “Single-Cause Event” is selected, the first cause is used as the cause of the event as a whole.

When “Multi-Cause Event” is selected, all causes listed in the event are counted in the analysis.



# Multiple vs Single Cause Events

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When I run the report to rank by **'count'**...


'Multi-Cause' is selected:

Both outage's causes are included in the report.

Outage Cause	Count	View
Equipment Damage	1	
Lightning	1	
<b>Total</b>	<b>2</b>	

'Single-Cause' is selected:

Only the first outage's cause (based on start time/date), is accounted for in the report analysis.

Outage Cause	Count	View
Lightning	1	
<b>Total</b>	<b>1</b>	

# Multiple vs Single Cause Events



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When I run the report to rank by **'duration'**...

'Multi-Cause' is selected:

Outage 1: 100 CI \* 10 mins = 1,000 customer minutes of duration


Outage 2: 50 CI \* 10 mins = 500 customer minutes of duration

Outage Cause	Customer Minutes of Duration	View
Lightning	1,000	
Equipment Damage	500	
<b>Total</b>	<b>1500</b>	

'Single-Cause' is selected:

Outage 1: 100 CI \* 10 mins = 1,000 customer minutes of duration

Outage 2: 50 CI \* 10 mins = 500 customer minutes of duration

Outage Cause	Customer Minutes of Duration	View
Lightning	1,500	
<b>Total</b>	<b>1500</b>	

# Part of Restoration

Record Outage Outages **Events** Export Import

Home / Events / Edit Event

## Edit Event

Name:

Cause Type  Single-Cause Event  
 Multi-Cause Event

## Outages for this Event

Bulk Actions ▾

Search:

Separate Selected Outages Into Unique Events

Set 'Is Part of Restoration' to 'Yes'

Set 'Is Part of Restoration' to 'No'

Delete Selected Outages

	Station	Circuit	Customers Out	Start Date	Is Part of Restoration?	
<input type="checkbox"/>	Substation	Circuit 3	100	01/01/2015	No	
<input type="checkbox"/>	Substation	Circuit 3	100	01/01/2015	Yes	
<input type="checkbox"/>	PR feature	South Substation	Circuit 3	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 4- To test PR feature	North Substation	Circuit 2	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 5- To test PR feature	North Substation	NS Circuit 1	50	01/01/2015	No
<input type="checkbox"/>	2451 Crystal Drive 6- To test PR feature	North Substation	NS Circuit 1	50	01/01/2015	Yes

Showing 1 to 6 of 6 entries

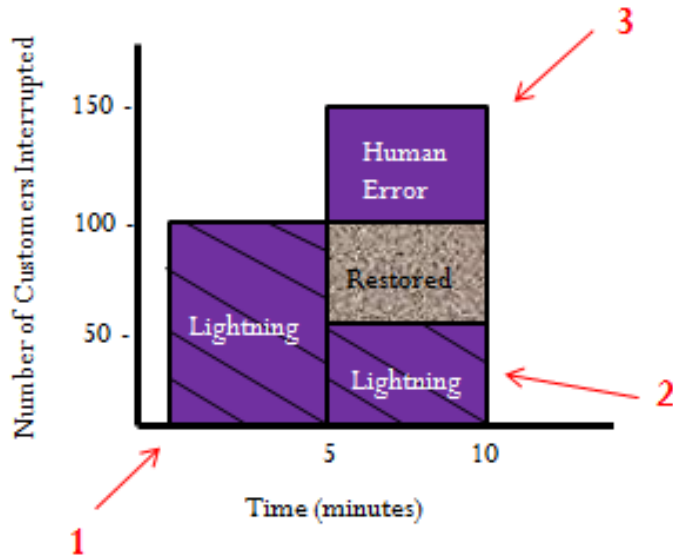
◀ Previous Next ▶

Set “Is Part of Restoration?” to ‘Yes’ if the customers interrupted in that outage are still the same customers as before.

Set the value to ‘No’ if the customers interrupted are new customers out.

# Part of Restoration

Let's try an example scenario...



Below is how we would enter this in the tracker. For our example, we are creating 3 separate outages and grouping them into one outage event.

Note the use of the column “Is Part of Restoration?”

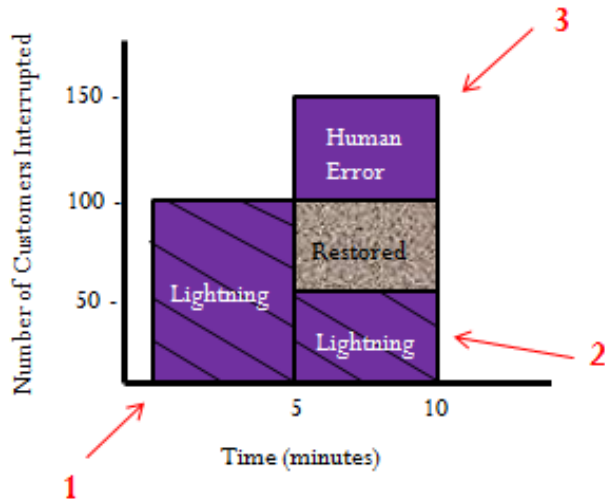
Bulk Actions ▾ Search:

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	1 2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2 2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	No
<input type="checkbox"/>	3 2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No



# Part of Restoration

If we keep all of the Part of Restoration values set to 'No'...



SAIFI = Total number of customer interruptions /  
Number of customers served

$$= [100+50+50] / \text{total \# of customers served}$$

Note that the number of customers interrupted is 200 because it is including the customers out from each outage entry.

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Showing 1 to 3 of 3 entries

Previous 1 Next

Customer Interruptions

200

Customer Minutes of Interruption

1000.0

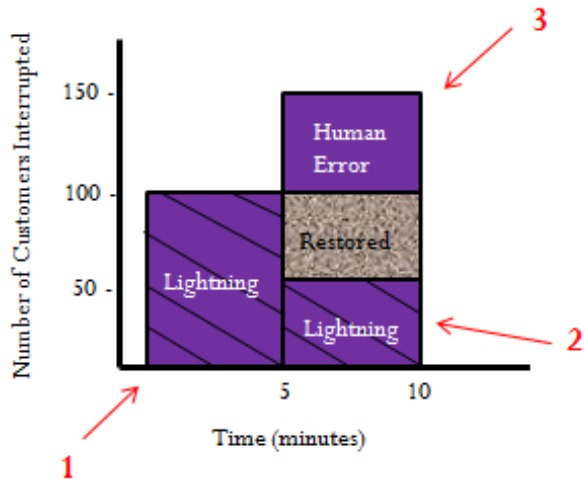
# Part of Restoration

Let's try an example scenario...

$$\text{SAIFI} = \frac{\text{Total number of customer interruptions}}{\text{Number of customers served}}$$

$$= \frac{[100+50]}{\text{total \# of customers served}}$$

Note that the number of customers interrupted does not include the second outage's customers because they are marked as 'Is Part of Restoration', indicating that they are the **same customers out**.



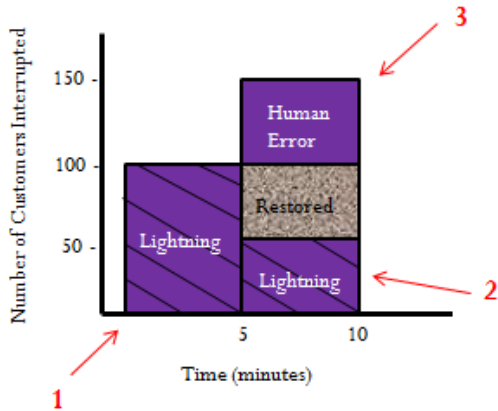
Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	Yes
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Showing 1 to 3 of 3 entries

Previous 1 Next

Customer Interruptions	150
Customer Minutes of Interruption	1000.0

# Part of Restoration



$$SAIDI = \frac{\text{Total customer minutes of interruption}}{\text{Number of customers served}}$$

$$= \frac{[(100)(5) + (50)(5) + (50)(5)]}{\text{total \# of customers served}}$$

Note that customer minutes of duration is the sum of the customer minutes of duration for all three outages in the event (or the area of all the purple boxes), regardless of the 'Part of Restoration' feature.

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	Yes
Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Customer Interruptions	150
Customer Minutes of Interruption	1000.0

# Part of Restoration and Multi/Single Event

## Edit Event

Name:

Cause Type  Single-Cause Event  
 Multi-Cause Event

Update Event

Cancel

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Showing 1 to 3 of 3 entries

Previous 1 Next

Customer Interruptions	200
Customer Minutes of Interruption	1000.0

Outage Cause	Count	View
Lightning	2	
Utility Human Error	1	
<b>Total</b>	<b>3</b>	

When the Causes Pie Chart report is run by 'Count' and the outages are all set to 'No' for 'Is Part of Restoration?', these are our results:

# Part of Restoration and Multi/Single Event

## Edit Event

Name:

Cause Type  Single-Cause Event  
 Multi-Cause Event

Update Event

Cancel

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning	50	01/01/2016 01:05:00	Yes
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Showing 1 to 3 of 3 entries

Previous 1 Next

Outage Cause Count View

Utility Human Error 1

Lightning 1

Total 2

Customer Interruptions 150

Customer Minutes of Interruption 1000.0

When the Causes Pie Chart report is run by 'Count' and the outages are all set to 'No' for 'Is Part of Restoration?', these are our results:

# Part of Restoration and Multi/Single Event

## Edit Event

Name:

Cause Type  Single-Cause Event  
 Multi-Cause Event

Update Event

Cancel

Select	Address	Substation	Circuit	Cause	Customers Out	Start Time	Is Part of Restoration?
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	100	01/01/2016 01:00:00	No
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 1	Lightning ✓	50	01/01/2016 01:05:00	Yes
<input type="checkbox"/>	2451 Restoration Avenue	North Substation	North Circuit 2	Utility Human Error ✓	50	01/01/2016 01:05:00	No

Showing 1 to 3 of 3 entries

Previous 1 Next

Customer Interruptions	150
Customer Minutes of Interruption	1000.0

Outage Cause	Count	View
Lightning	1	
<b>Total</b>	<b>1</b>	

Outage Cause	of Duration	View
Lightning	1,000	
<b>Total</b>	<b>1000</b>	

If 'Single-Cause' is selected, the system will completely ignore the 'Is Part of Restoration' feature and work as previously discussed.

# Reports Tab

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- IEEE Statistics Report
- SAIDI/SAIFI/CAIDI Reports
- Outage Causes Report
- Causes Pie Chart Report
- Circuit Ranking Report

# Reports Tab – IEEE 1366 Report

IEEE 1366 Statistics SAIDI CAIDI SAIFI Circuit Ranking Cause Pie Chart

### IEEE Statistics Report

Start Date

End Date

Remove Major Events?

Top-level Cause

Minimum event duration (in minutes)

Maximum event duration (in minutes)

Substation

Circuit

Exclude Loss of Supply

Failure of Greater Transmission  
Loss of Generating Unit

Generate Report Download to CSV Print

For sustained outage calculations, enter “5” in the Minimum Event Duration filter.

For momentary outage calculations, enter “5” in the Maximum Event Duration filter.

Please select criteria to generate a report.

**\*NEW\***

Exclude Loss of Supply feature can now be used!



# Reports Tab – IEEE Report

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- Sample Results:

## IEEE Results

ASAI (percent)	99.8141
CAIDI (minutes)	1725.195
SAIDI (minutes)	791.237
SAIFI (number of interruptions)	0.5

# Reports Tab – SAIDI Report

## SAIDI Report

Start Date 01/01/2014

End Date 12/31/2014

Remove Major Events? Use IEEE Day threshold

Top-level Cause

Minimum event duration (in minutes)

Maximum event duration (in minutes)

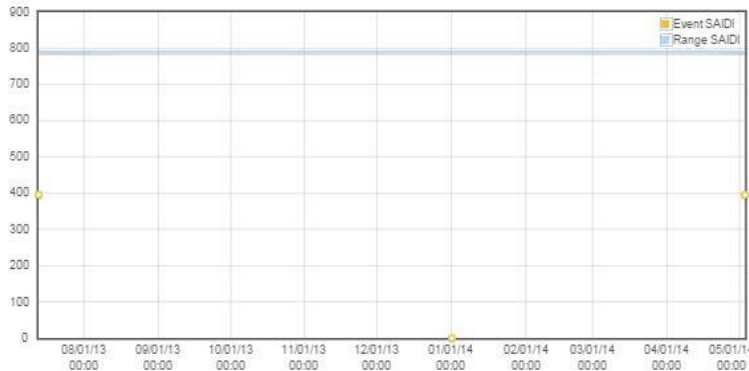
Substation

Circuit

Exclude Loss of Supply  
Failure of Greater Transmission  
Loss of Generating Unit

Generate Report Download to CSV Print

## SAIDI Results



### Range Results

SAIDI (minutes)	791.237
Event Count	3
IEEE SAIDI Day Threshold (minutes)	N/A

# Reports Tab – Causes Pie Chart

IEEE 1366 Statistics SAIDI CAIDI SAIFI Circuit Ranking Cause Pie Chart

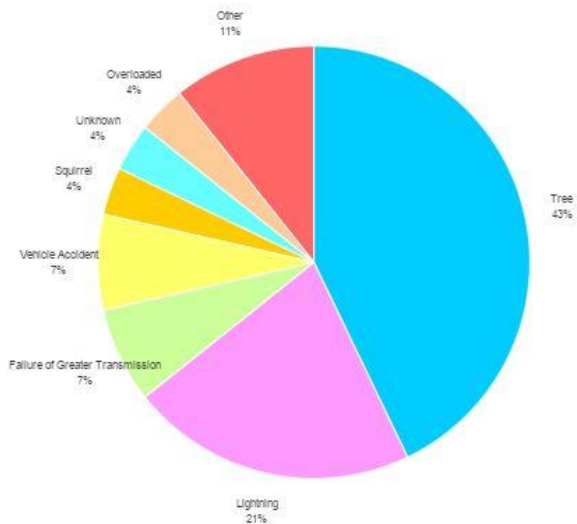
Start Date: 01/01/2013  
End Date: 12/31/2013  
Top-level Cause: ---

Substation: ---  
Circuit: ---

Report on Outage:  Count  Duration

Generate Report Download to CSV Print

This toggle button allows you to either rank the causes by count or by duration.



Outage Cause	Count	View
Tree	12	
Lightning	6	
Failure of Greater Transmission	2	
Vehicle Accident	2	
Squirrel	1	
Unknown	1	
Overloaded	1	
Equipment Worn Out	1	
Equipment	1	
Equipment Damage	1	
Total	28	

Select the “eye-con” to see the outages that are being included in the analysis under the specific cause.


# Reports Tab – Circuit Ranking



### Circuit Ranking Report

Start Date: 01/01/2014  
End Date: 12/31/2014  
Top-level Cause: ---

Minimum event duration (in minutes):  
Maximum event duration (in minutes):  
Substation: ---

Generate Report Download to CSV Print

Top 10 Circuits Ranked by Customer Minutes of Duration			
Circuit Name	Substation Name	Customer Minutes of Duration	View
NS Circuit 1	North Substation	17400000.0	
Circuit 5	Central Substation	750.0	

Top 10 Circuits Ranked by Customer Interruptions			
Circuit Name	Substation Name	Number of Customer Interruptions	View
Circuit 5	Central Substation	2	
NS Circuit 1	North Substation	2	

Select the “eye icon” to see the outages that are being included in the analysis.

---

# Reports Tab – Monthly report and Live Demo

# Live Demo – Importing Data

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Simple and Advanced Import Features

Speaker: Christina Ospina

# Annual Report

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- Customized annual report is provided to each utility as part of their subscription
- Contains aggregate data
  - Per region
  - Customer size classes
  - eReliability Tracker users as a whole
- **Don't forget to enter your data for 2015 by January 1<sup>st</sup>!!**

# Sample Annual Report

**Table 2**

**Average SAIDI for all utilities that use the eReliability Tracker (with and without MEs), belong to your region, and are grouped in your customer size class**

	All	No MEs	Unscheduled	Scheduled
Your utility's SAIDI:	11.3212	7.9522	15.3765	1.1904
Average eReliability Tracker Utility SAIDI	108.8641	64.7918	115.4785	3.5419
Average SAIDI for Utilities Within Your Region	57.6741	55.9107	55.6001	1.0091
Average SAIDI for Utilities Within Your Customer Size Class	92.1576	70.8481	103.5822	3.5712

-Customized statistics and data for each utility.

**Table 3**

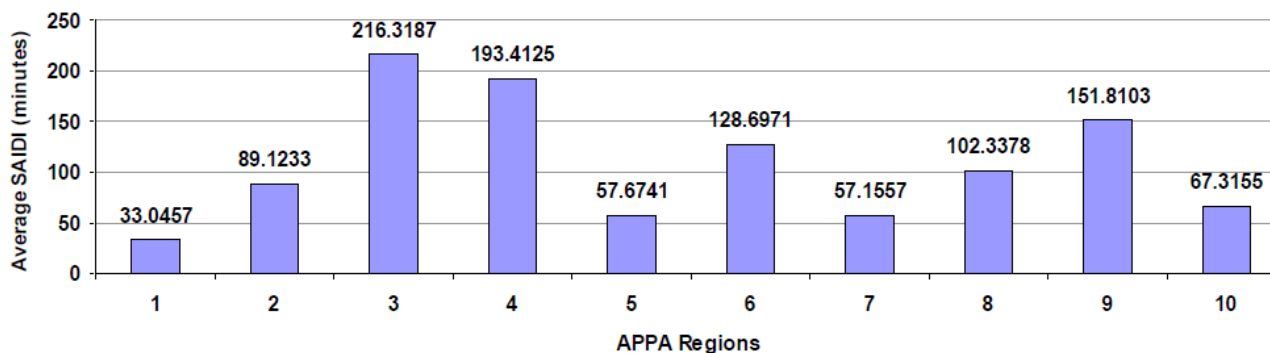
**Summary statistics of the SAIDI data compiled from the eReliability Tracker**

	All	No MEs	Unscheduled	Scheduled
Minimum Value	0.0473	0.0238	0.0473	0
First Quartile (25th percentile)	9.5674	9.2183	9.5674	0
Median Quartile (50th percentile)	35.4569	29.1636	36.2547	0.0297
Third Quartile (75th percentile)	103.7864	63.7411	102.8258	1.2341
Maximum Value	1262.1172	886.6487	1262.1172	44.6722

-Includes aggregate data for those utilities within your region and within your customer size class for the purposes of benchmarking and comparison.

**Figure 3**

**Average SAIDI for all utilities that use the eReliability Tracker per region**

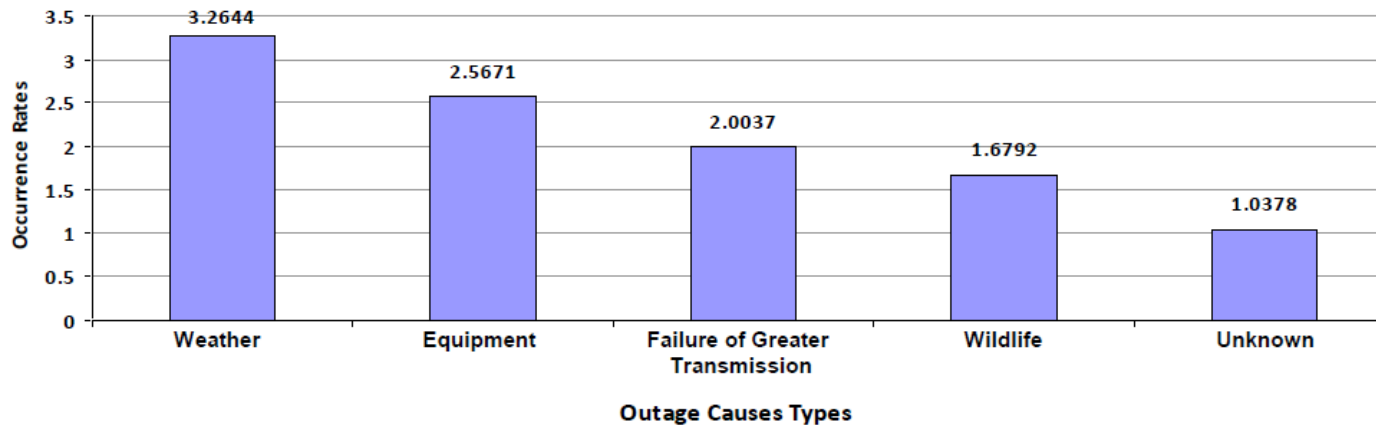




# Sample Annual Report

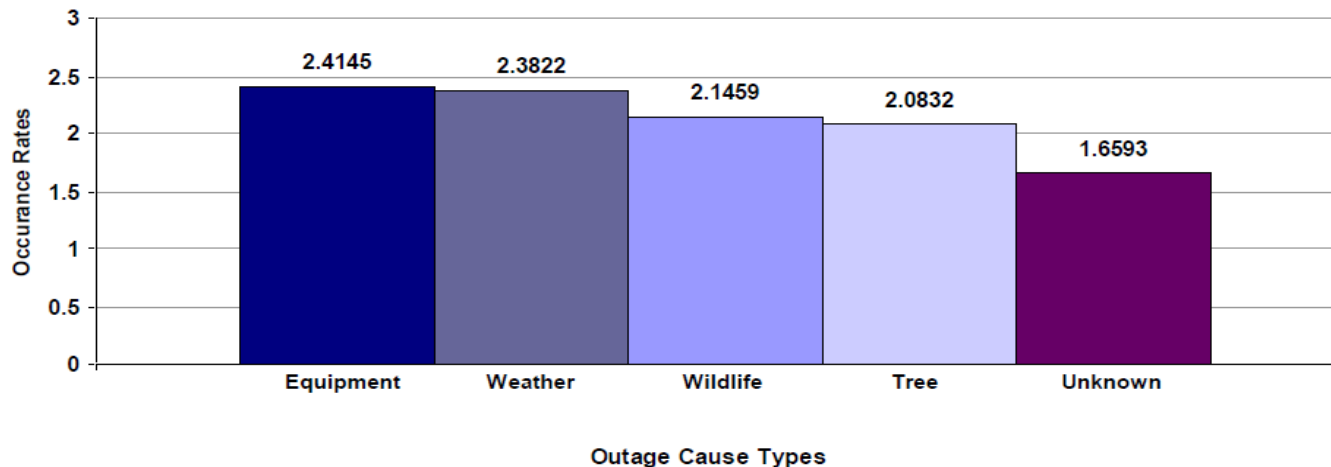
**Figure 8**

Top five customer-weighted occurrence rates for common causes of sustained outages for all utilities that use the eReliability Tracker System <sup>2</sup>



**Figure 10**

Top five customer-weighted occurrence rates for sustained outage causes in your region <sup>2</sup>



If you have any questions, please email [Reliability@PublicPower.org](mailto:Reliability@PublicPower.org).

*Thanks for joining us!*

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