Avista

Electric Service Reliability Monitoring and Reporting Plan

CONTENTS

INTRODUCTION

Washington investor-owned electric companies are to provide statements describing their reliability monitoring and reporting plans and annual report submittal dates pursuant to WAC 480-100-393 and WAC 480-100-398, Electric System Reliability. These rules were adopted in the Commission's rulemaking in Docket No. UE-991168.

Avista Utility's system includes ten geographical areas that are in a three states. The Annual Reports include both the State of Washington and the State of Idaho. Two of these divisions straddle the Washington and Idaho border and commingle jurisdictional customers.

The Company will file the annual report with the Commission, encompassing the previous calendar year of events, by April 30th of each year, consistent with the reliability monitoring and reporting plan filed herein. Using the baseline statistics, Avista Utilities will compare each year's results to the baseline results and to those results from previous years as well. Avista will maintain historical reliability information for seven years.

Any changes made to the Company's plan regarding data collection methods or calculations of the reliability indices will be described in that year's report. In addition, Avista Utilities will explain how these changes affect comparisons to previous, future and baseline information.

The Company will identify the utility's geographical divisions of greatest reliability concern, explain their causes, and explain how the Company plans to address them.

As AMR/AMI metering is implemented in the future and the customer meter provides outage information to the OMT system through an interface, the SAIDI and CAIDI numbers are expected to increase. This is similar to the previous annual report discussion on the implementation of the OMT system increasing the SAIFI and SAIDI numbers just due to the better reporting of the customer affected.

Use of the OMT system and GIS data has improved the tracking of the numbers of customers without power, allowed for better prioritization of the restoration of service and the improved dispatching of crews.

For the year end 2010 to 2014 reports there is an expectation of varying numbers and also improving numbers for some specific Office areas as the implementation of Smart Grid is completed. Various stages of transition are also expected.

DEFINITIONS

Pursuant to WAC 480-100-388, Avista Utilities provides its definitions of the following items.

"*Reliability Statistic"* – Standard Statistics measures and calculation methods are per the IEEE Standard 1366-2003 (or latest version) Titled "IEEE Guide for Electric Power Distribution Reliability Indices". Same as Reliability Indices.

"Major event" – Modified this definition to the IEEE Standard 1366-2003 (or latest version) of Major Event Day (MED), which uses a process "Beta Method" to identify a Major Event Day. The previous definition was "An event that impacts more than 5% of the Company's customers and causes outages of more than 24 hours in duration in any given division within its territory".

"Sustained Interruption" - An interruption lasting longer than 5 minutes.

"Momentary Event Interruption" – An interruption(s) of duration 5 minutes or less. Each event consists of one trip and one reclose operation that occur within 5 minutes. For example, if an interrupting device operates three times and then holds, this would be counted as three events with the number of customers affected as three times the Ni.

"Baseline reliability statistic" – Avista will compare its reliability statistics to the year 2005.

"Reliability Target" - A statistical method was developed in 2004 for baseline statistics. The method is defined as the average over a specific timeframe and 2 times the standard deviation. For 95% of the time, the Reliability Statistic should be below the target.

"*Customer Complaint"* - When a customer is not satisfied with the Company as it relates to Electric Reliability and makes a complaint directly to a Company representative.

"Commission Complaint" – When a customer is not satisfied with the Company as it relates to Electric Reliability and files a complaint directly with the Commission.

DATA COLLECTION AND CALCULATION CHANGES

Data Collection

Since Avista's Electric Service Reliability Monitoring and Reporting Plan were filed in 2001, there have been several improvements in the methods used to collect outage data. In late 2001, centralizing the distribution trouble dispatch and data collection function for Avista's entire service territory began. The distribution dispatch office is located in the Spokane main complex. At the end of September 2005, 100% of the Company's feeders, accounting for 100% of the customers, are served from offices that employ central dispatching.

The data collected for 2010 represents the fifth full year of outage data collected through the Outage Management Tool (OMT). For 2010, all data was collected using the "Outage Management Tool" (OMT) based on the Company's Geographic Information System (GIS). The OMT system automates the logging of restoration times and customer counts.

Even as good as the OMT system is at quantifying the number of customers and duration of the outage duration, there still are areas where the data collection is not precise. Determining the exact starting time of an outage is dependent on when a customer calls in, how well the Avista Distribution Dispatcher determines where the outage is and defines the device that has opened to remove the faulted section.

The OMT system relies heavily on the Customer Interactive Voice Recorder (IVR) system to automatically generate incidents in OMT. As more customers call in, the Electric Dispatcher can bundle customers assuming a device has opened creating the sustained interruption record. Then the interruption is confirmed by field personnel and a partial restoration or final restoration is completed and closed. An outage cause is assigned at the time the record is closed out and the field personnel determine it.

Interruption Cause Codes

The Company uses cause information to analyze past outages and, if possible, reduce the frequency and duration of future outages. Further cause code information is provided in a later section.

Customers Experiencing Multiple Interruptions

The IEEE Standard 1366P-2003 provides for two methods to analyze data associated with customers experiencing multiple momentary interruptions and/or sustained interruptions. Avista's Outage Management Tool (OMT) and Geographical Information System (GIS) provide the ability to geospatially associate an outage to individual customer service points. This association allows for graphically showing Customers Experiencing Multiple sustained Interruptions ($CEMI_n$) with Major Event Day data included onto GIS produced areas. 2010 information is provided in the new section added to the 2007 report after the Areas of Concern Section to summarize the analysis Avista performed on the 2010 outage data. The calculation for $CEMI_n$ and Customers Experiencing Multiple Sustained and Momentary Interruptions $CEMSMI_n$ is provided in the Indices Calculations section.

Major Events

Major Events and Major Event Days as used in this report are defined per the IEEE Guide for Electric Power Distribution Reliability Indices, IEEE P1366-2003. The following definitions are taken from this IEEE Guide.

> **Major Event** – Designates an event that exceeds reasonable design and or operation limits of the electric power system. A Major Event includes at least one Major Event Day (MED).
>
> **Major Event Day** – A day in which the daily system SAIDI exceeds a threshold value, T_{MED}. For the purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than T_{MED} are days on which the energy delivery system experienced stresses beyond that normally expected (such as severe weather). Activities that occur on major event days should be separately analyzed and reported.

The Company will use the process defined in IEEE P1366 to calculate the threshold value of T_{MED} and to determine MED's. All indices will be reported both including and excluding MED's. The comparisons of service reliability to the baseline statistics in subsequent years will be made using the indices calculated without MED's.

Customer Complaints

Customer Complaints, as previously defined, will be logged by a Customer Service Representative in the Customer Service System (CSS). The Company will use its best effort to track and document the cause of each complaint as it relates to Electric Reliability.

SYSTEM INDICES

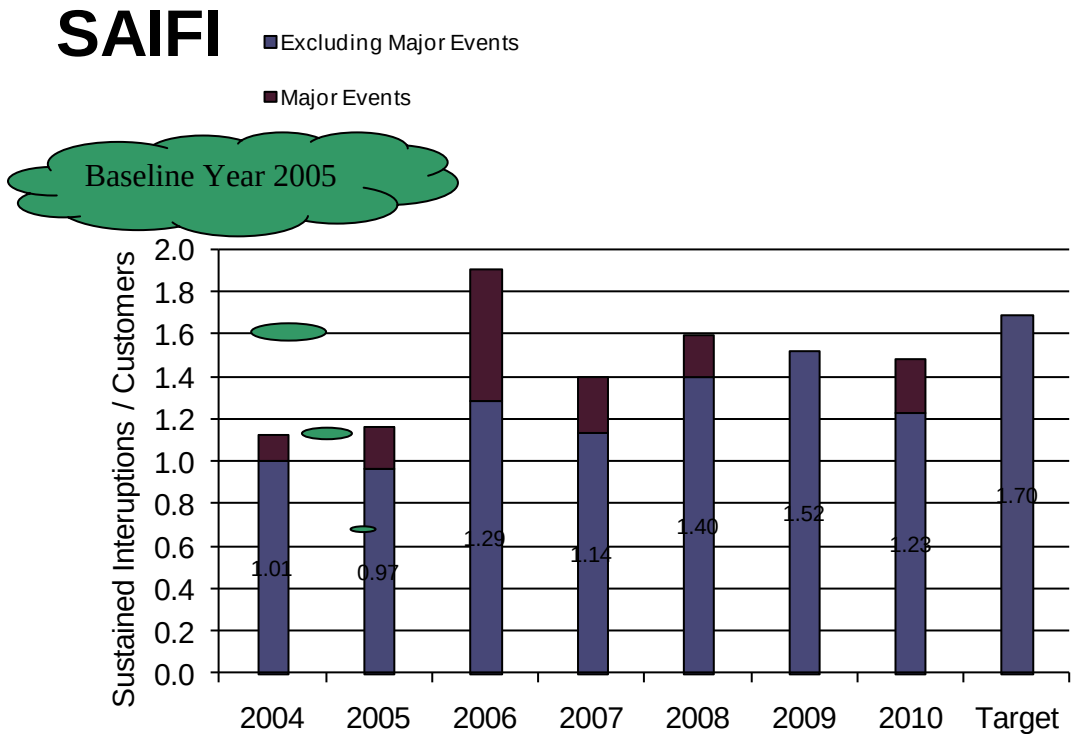
Avista is and will continue to report to the Commission the following four reliability indices with major events both included and excluded. Additionally a new indice is being reported that looks at the number of sustained interruptions (including MED sustained interruptions) an individual customer experiences. This indice is CEMI. These Reliability Index Calculations were extracted from "IEEE Guide for Power Distribution Reliability Indices" (IEEE Std 1366--2003):

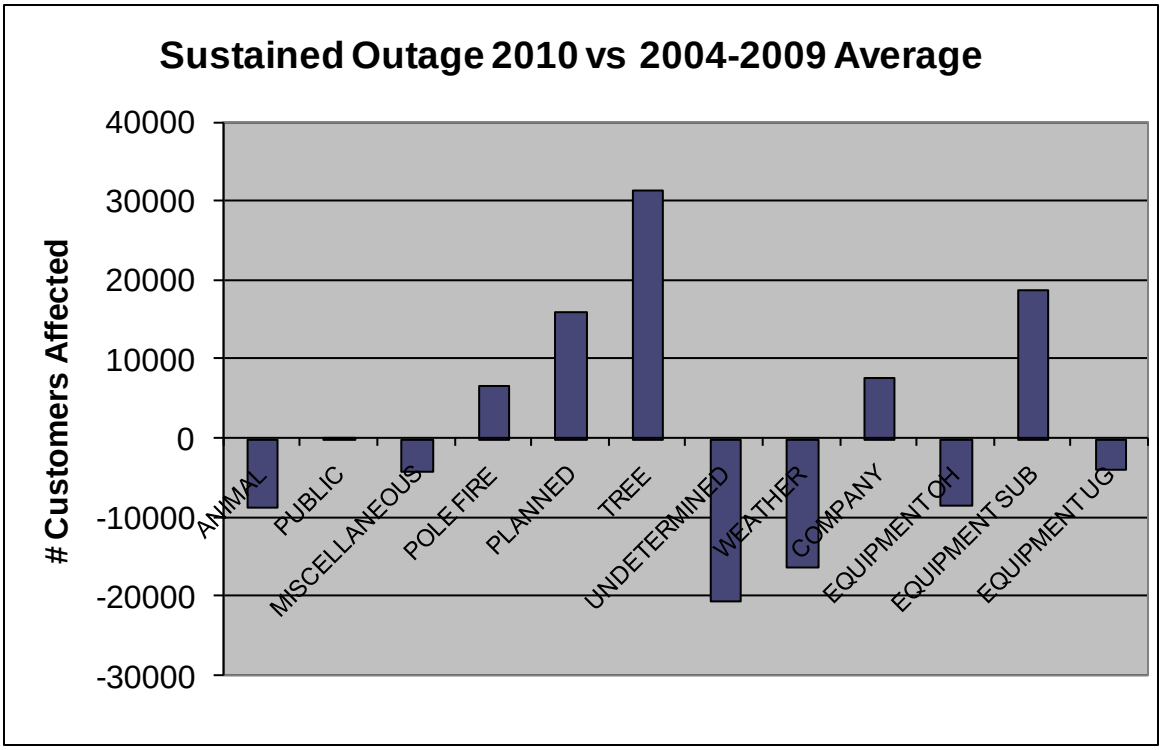
With the definition of Major Event Days using the IEEE 1366 standard an analysis of major events will be included in the Company's index calculations. All events are included because the Company's goal is to reduce outages whether caused by major events or day-to-day operations.

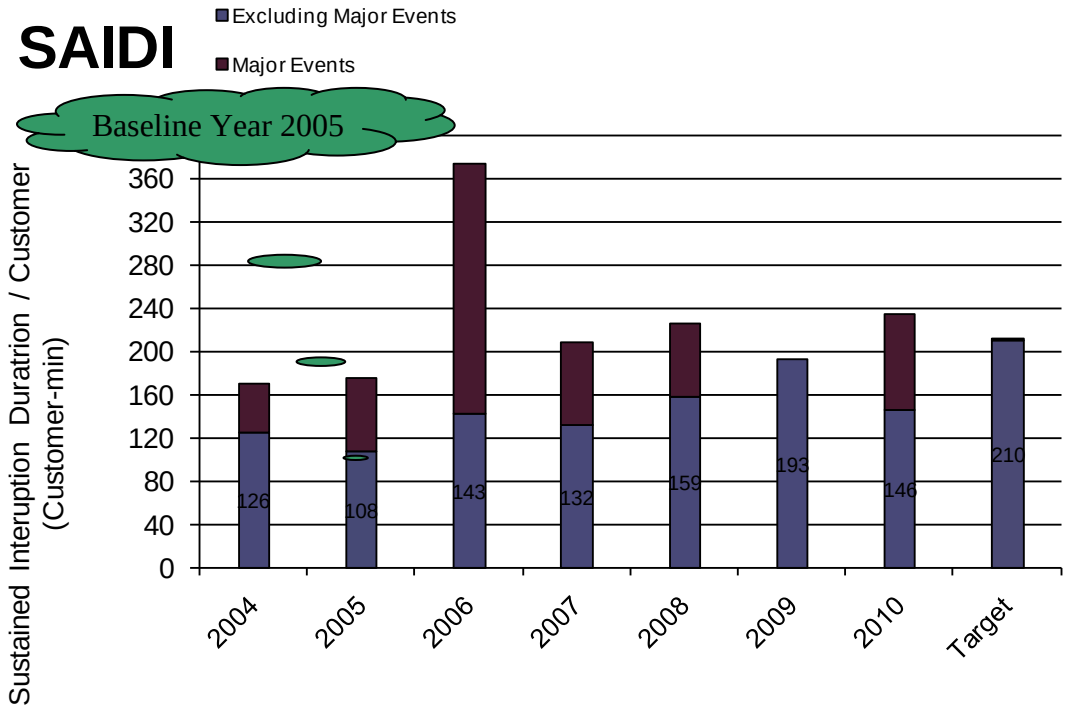
The Company notes that the rules establish reliability monitoring and reporting requirements only and do not set performance or program standards. Avista Utilities did begin reporting against performance targets to address the need for baseline statistics within three years of the effective date of the rule or April 21, 2004. The performance target is based upon a statistical

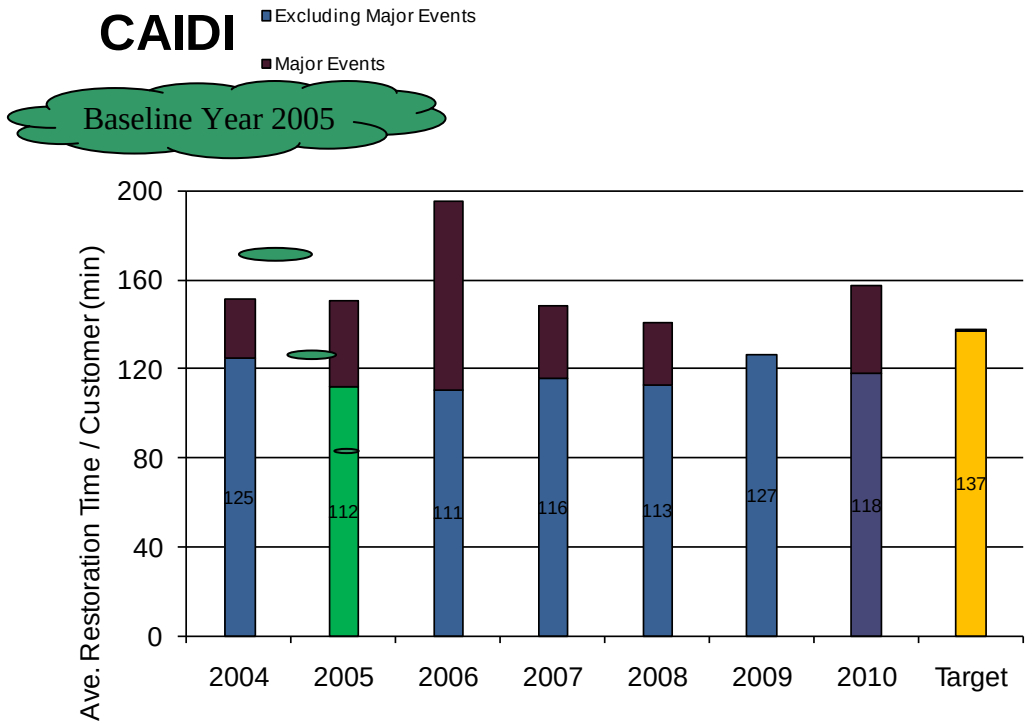
"bell curve" relationship between outages, weather, and other influences. The baseline was modified as more reliability data was collected and also with better data reporting through the technology improvements made to the OMT system. This plan establishes 2005 as the baseline year for reliability statistics.

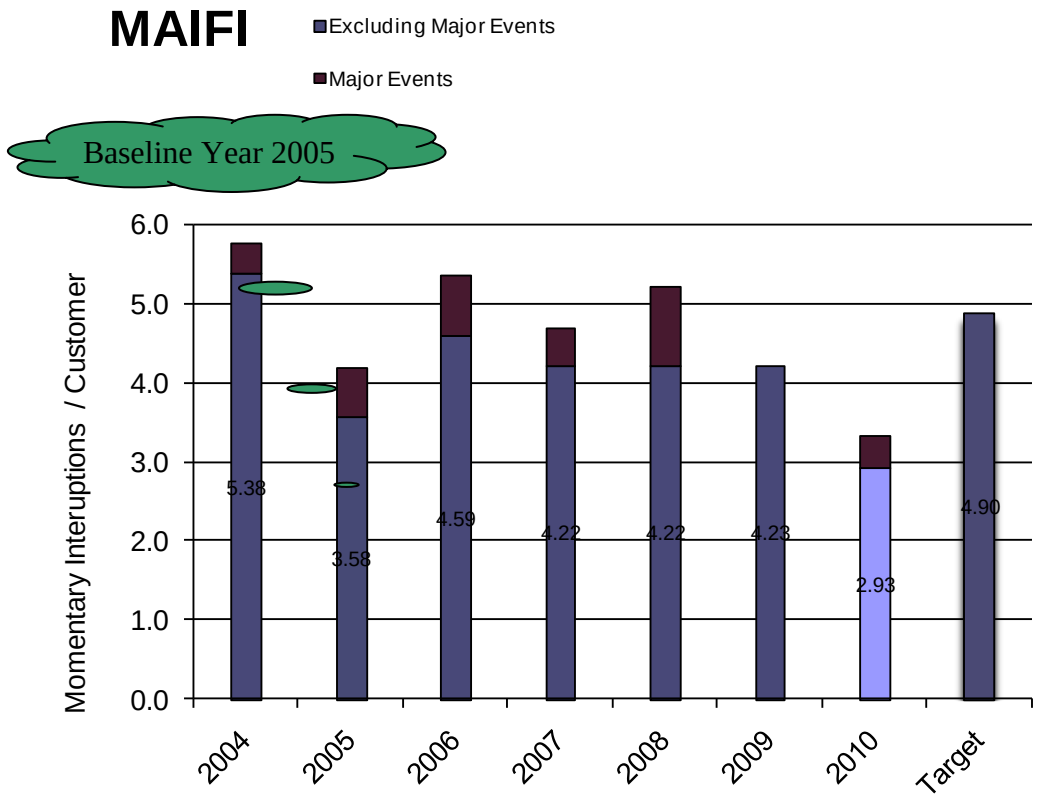
The following charts provide a sample showing the Company's method of charting the four indices on a yearly basis. Also, the Company comparison to the reliability target for each index is shown. The second chart provides a current year to the previous time period average indice to show variance from year to year.

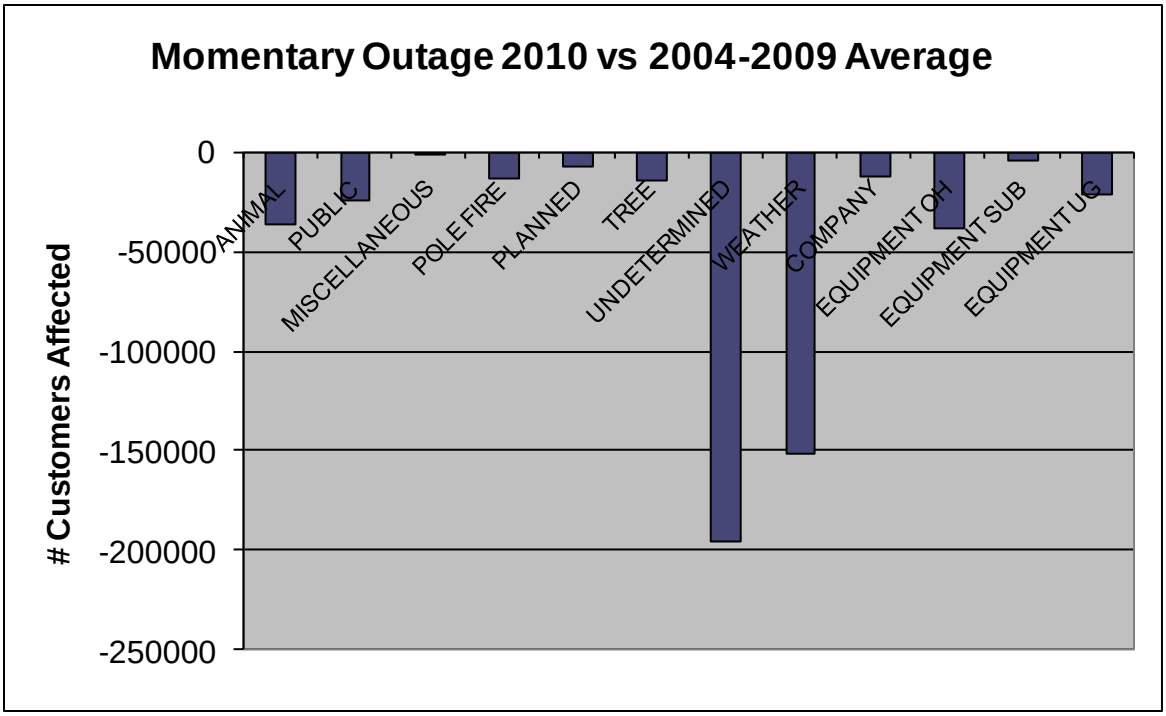



Sustained Outage 2010 vs 2004-2009 Average
Customers Affected
40000
30000
20000
10000
0
-10000
-20000
-30000
ANIMAL
PUBLIC
MISCELLANEOUS
POLE FIRE
PLANNED
TREE
UNDETERMINED
WEATHER
COMPANY
EQUIPMENT OH
EQUIPMENT SUB
EQUIPMENT UG


SAIDI
Excluding Major Events
Major Events
Baseline Year 2005
Sustained Interuption Duratrion / Customer (Customer-min)
360
320
280
240
200
160
120
80
40
0
126
108
143
132
159
193
146
210
2004
2005
2006
2007
2008
2009
2010
Target


CAIDI
Excluding Major Events
Major Events
Baseline Year 2005
Ave. Restoration Time / Customer (min)
200
160
120
80
40
0
125
112
111
116
113
127
118
137
2004
2005
2006
2007
2008
2009
2010
Target


MAIFI
Excluding Major Events
Major Events
Baseline Year 2005
Momentary Interuptions / Customer
6.0
5.0
4.0
3.0
2.0
1.0
0.0
5.38
3.58
4.59
4.22
4.22
4.23
2.93
4.90
2004
2005
2006
2007
2008
2009
2010
Target

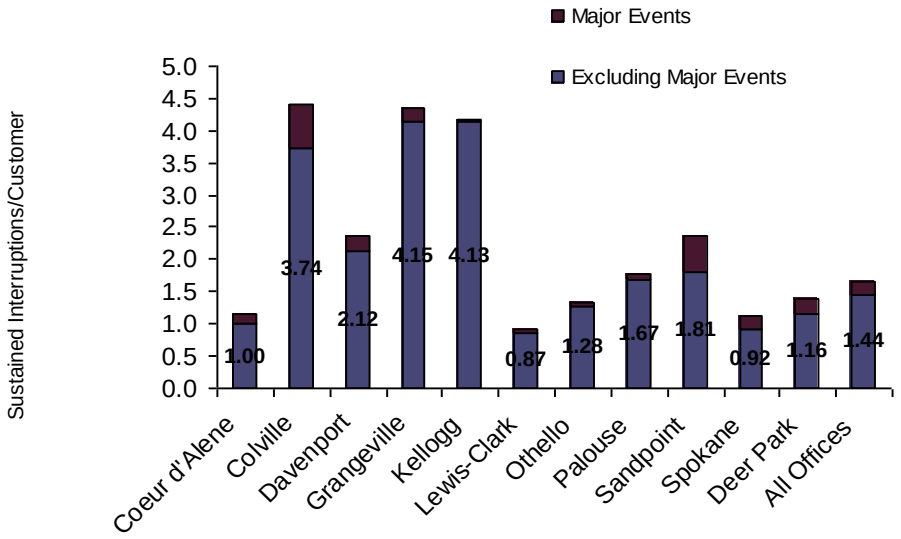


All charts and tables in this section are provided for illustrative purposes; the Company may change the future presentation of this information without changing the underlying data.

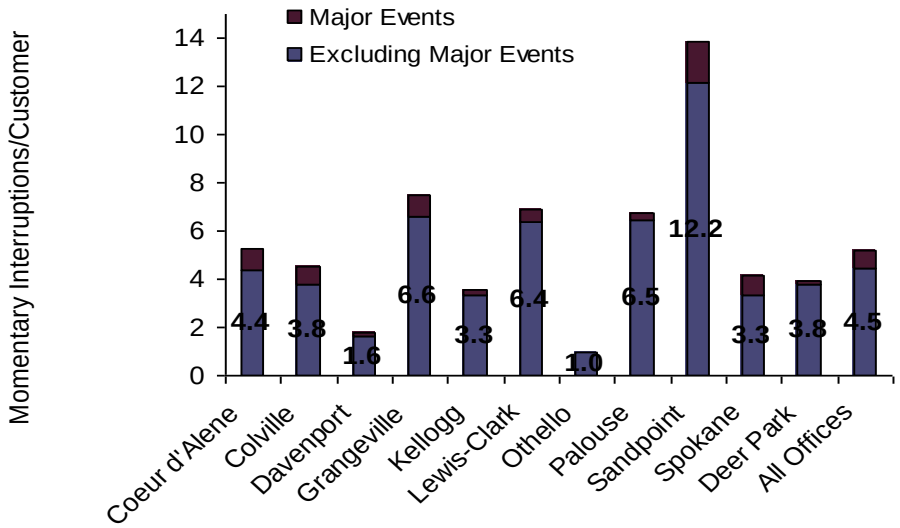
OFFICE INDICES

Office Indices sample charts are shown below.

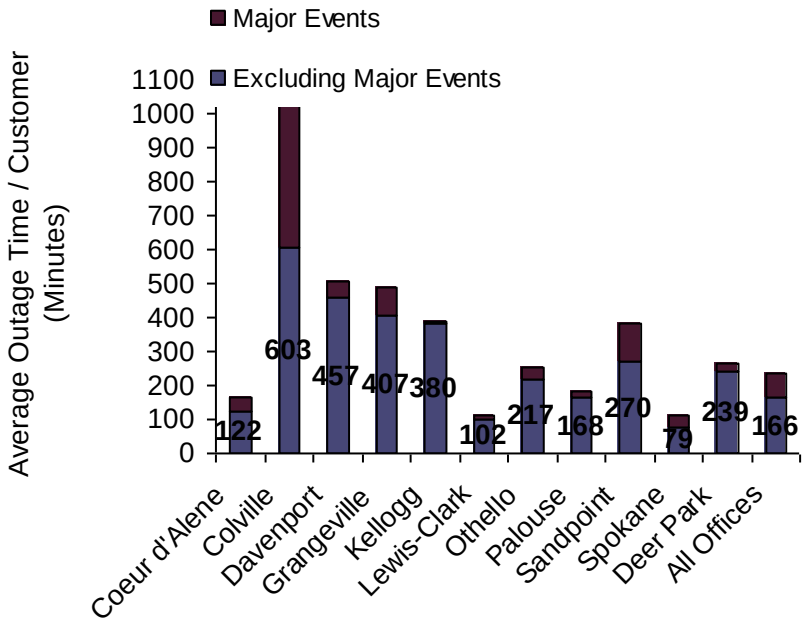
SAIFI



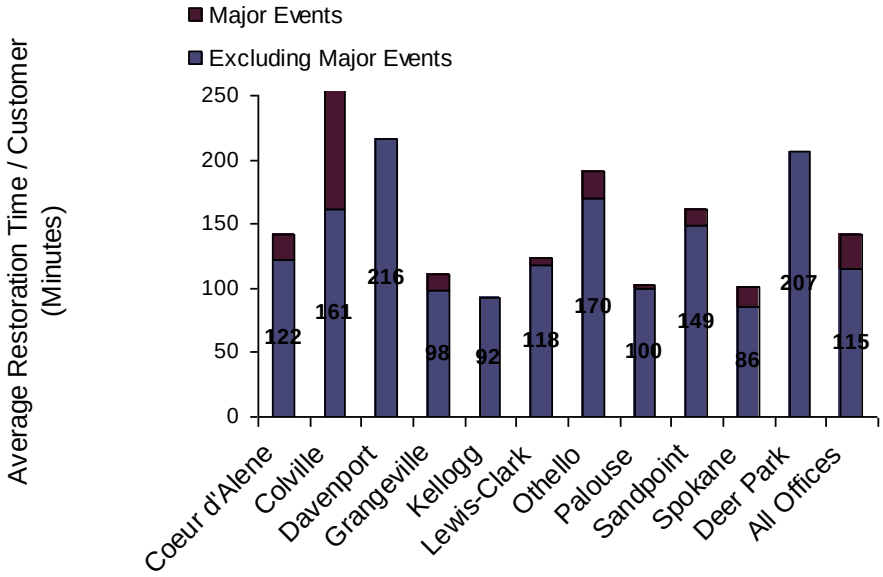
MAIFI



SAIDI



CAIDI



All charts and tables in this section are provided for illustrative purposes; the Company may change the future presentation of this information without changing the underlying data.

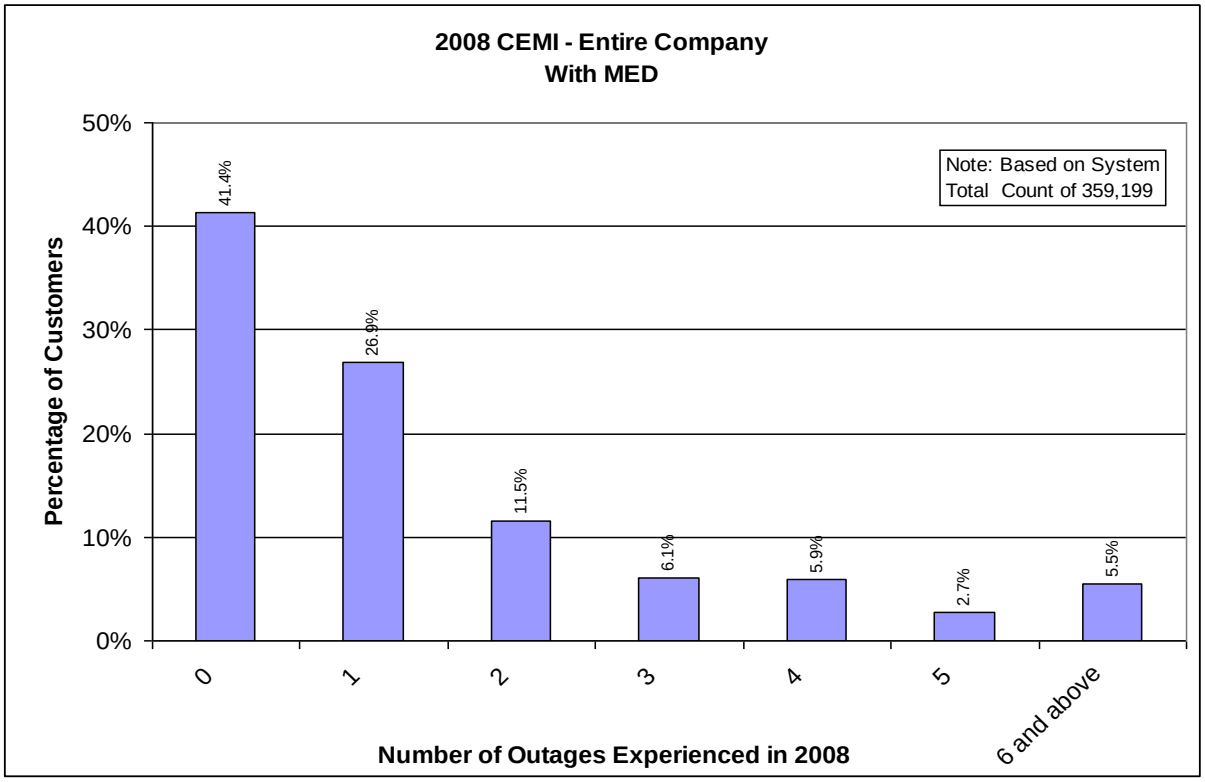
AREAS OF CONCERN

The report will identify and discuss areas of concern to the Company. The areas of concern are identified by using a combination of data (Ri, RixNi, and Momentary Ni), the CEMI area graphs, customer complaints, and the judgment of Engineering and the Local Area Operating Personnel.

CUSTOMERS EXPERIENCING MULTIPLE INTERRUPTIONS

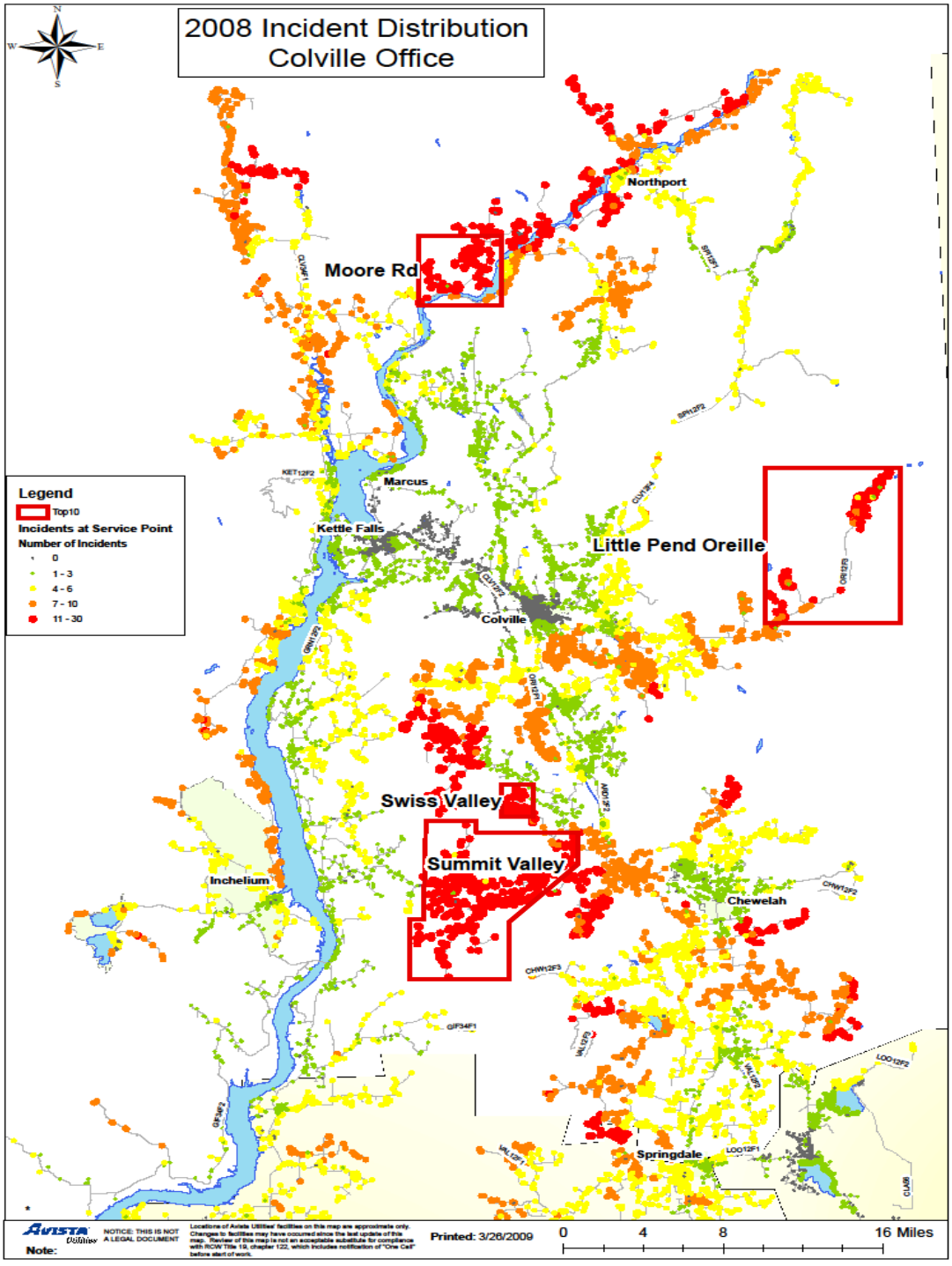
The first chart below provides a view of the percentage of customers served from the Avista system that have sustained interruptions. 68 % of Avista customers had 1 or fewer sustained interruptions and 5.5% of Avista customers had 6 or more sustained interruptions during 2008.

6.1 CEMIn Service Territory



6.2 CEMIn Office Charts

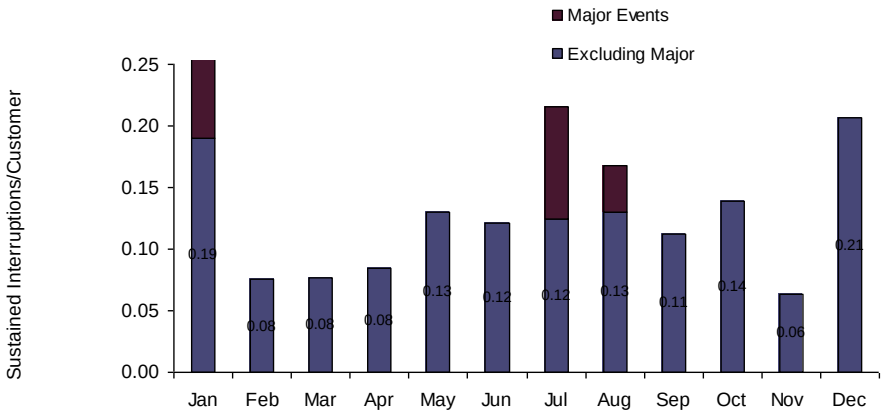
The remaining geographic plots show the sustained interruptions by color designation according to the legend on each plot for each office area. Note the office area is designated as the area in white for each plot and that there is overlap between adjacent office area plots. The adjacent office areas are shown in light yellow.



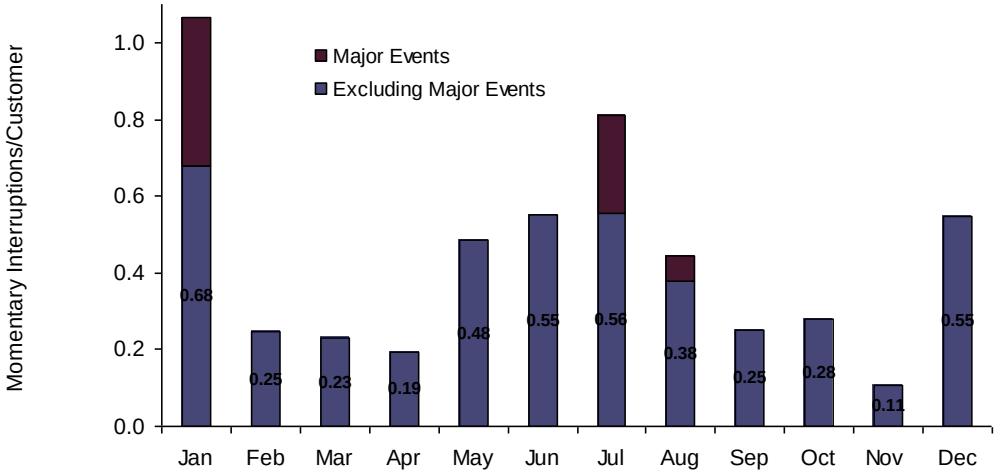
MONTHLY INDICES

Each of the following indices, reported by month, shows the variations from month to month. These variations are partially due to inclement weather and, in some cases, reflect incidents of winter snowstorms, seasonal windstorms, and in mid- and late summer lightning storms. They also reflect varying degrees of animal activity causing disruptions in different months of the year.

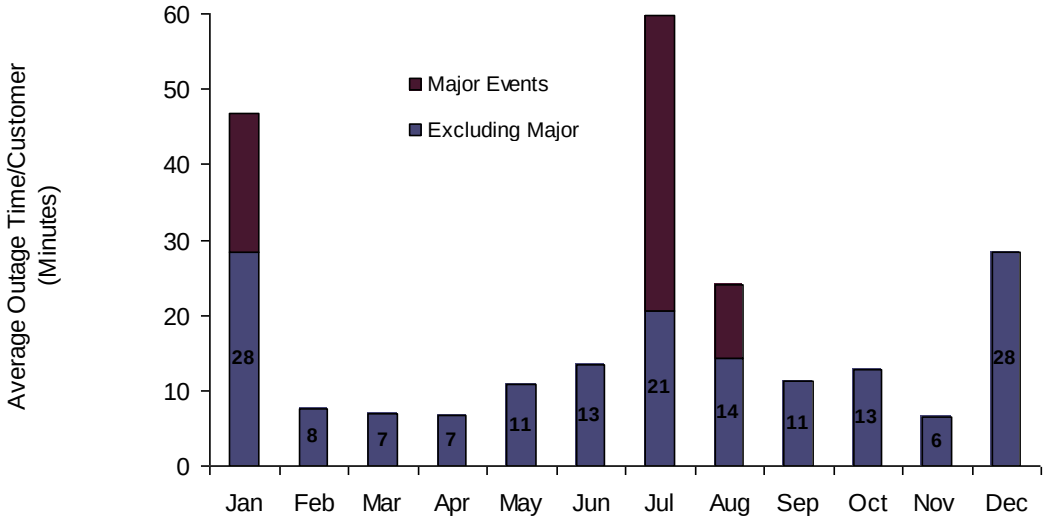
SAIFI



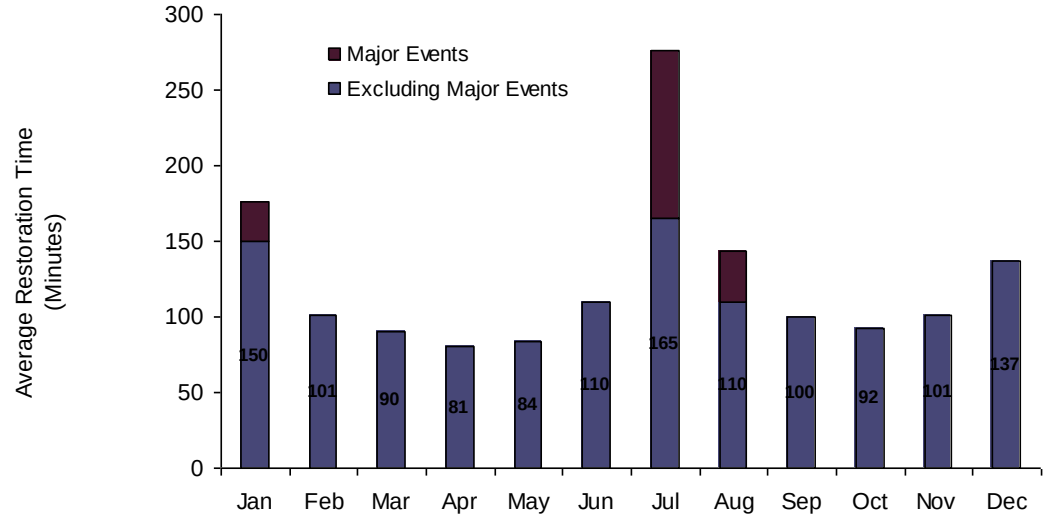
MAIFI



SAIDI


Average Outage Time/Customer (Minutes)
60
50
40
30
20
10
0
Major Events
Excluding Major
28
8
7
7
11
13
21
14
11
13
6
28
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

CAIDI


Average Restoration Time (Minutes)
300
250
200
150
100
50
0
Major Events
Excluding Major Events
150
101
90
81
84
110
165
110
100
92
101
137
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

CUSTOMER COMPLAINTS

The following is a list of Complaints made to the Commission during this year.

Customer Address/Feeder	Complaint	Complaint Category	Resolution
Grangeville ID Grangeville 1274	Customer concerned about lack of timely notification for planned outages. He uses oxygen & needs power or a decent notice so he has backup power for his batteries. Customer stated that Avista told him after the last incident that notification would be printed in the local paper to let everyone in Grangeville know about the planned power outage a week before outage.	Outages or Major Event or Power Quality	No resolution documented.

The following is a list of complaints made to our Customer Service Representatives.

Customer Address/Feeder	Complaint	Complaint Category	Resolution
Post Falls ID Pleasant View 243	Feeder trip 09/08/10 at 7:20 p m customer upset that it has caused co. money exp the trip is to protect our equip from damaging lines and longer outages wants an incident report emailed to him for their records.	Outages or Major Event or Power Quality	No Resolution Documented.

SUSTAINED INTERRUPTION CAUSES

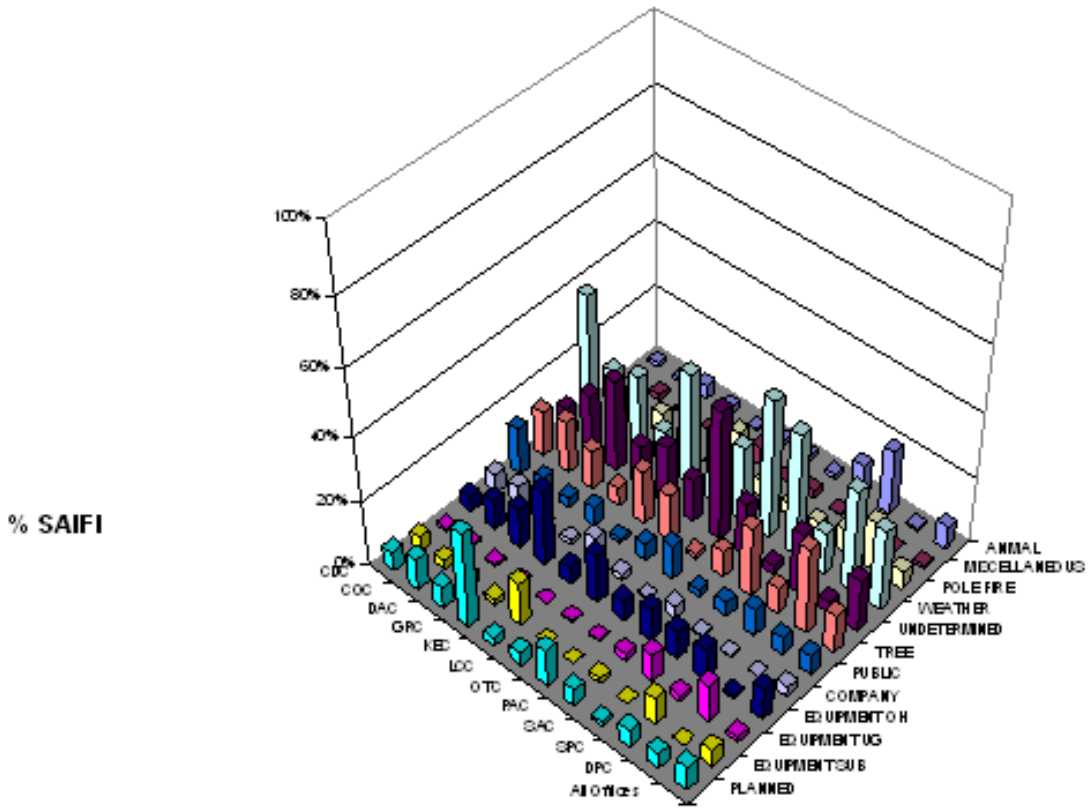
Table .1 - % SAIFI per Cause by Office

The following table lists the percentage SAIFI contribution by causes for outages excluding major event days.

Reason	CDC	COC	DAC	GRC	KEC	LCC	OTC	PAC	SAC	SPC	DPC	All Offices
ANIMAL	1.4%	0.9%	4.1%	2.3%	0.3%	2.0%	2.0%	1.3%	9.8%	19.7%	1.0%	7.0%
MISCELLANEOUS	0.1%	1.8%	1.1%	0.0%	0.0%	5.3%	0.0%	2.3%	0.6%	0.3%	0.0%	1.0%
POLE FIRE	0.5%	8.9%	6.3%	5.0%	0.2%	16.1%	5.3%	3.8%	3.9%	7.2%	15.4%	5.8%
WEATHER	39.0%	20.5%	23.8%	11.6%	34.9%	22.0%	22.6%	42.5%	37.7%	12.5%	31.4%	24.9%
UNDETERMINED	9.2%	18.4%	28.2%	12.9%	18.0%	13.1%	39.9%	16.6%	3.0%	18.7%	3.3%	16.1%
TREE	13.9%	15.9%	11.9%	5.6%	16.3%	14.5%	1.5%	8.1%	21.2%	8.2%	26.5%	11.8%
PUBLIC	14.5%	3.9%	2.9%	5.6%	1.3%	5.4%	10.6%	2.3%	4.5%	8.2%	5.4%	6.0%
COMPANY	5.8%	7.3%	0.0%	1.5%	7.8%	2.1%	0.3%	3.7%	0.7%	0.3%	0.0%	3.2%
EQUIPMENT OH	4.8%	9.2%	12.0%	23.5%	5.0%	14.7%	6.2%	9.9%	8.8%	9.5%	0.9%	9.8%
EQUIPMENT UG	0.6%	1.0%	0.6%	0.8%	0.2%	0.6%	0.5%	2.5%	8.5%	1.7%	11.4%	1.8%
EQUIPMENT SUB	4.4%	2.7%	2.5%	2.0%	13.2%	0.0%	0.0%	1.6%	0.0%	8.2%	0.0%	5.1%
PLANNED	5.9%	9.4%	6.4%	29.3%	2.6%	4.1%	11.1%	5.3%	1.3%	5.4%	4.8%	7.5%

% SAIFI per Cause by Office

The following chart shows the percentage SAIFI contribution by causes for outages excluding major event days.



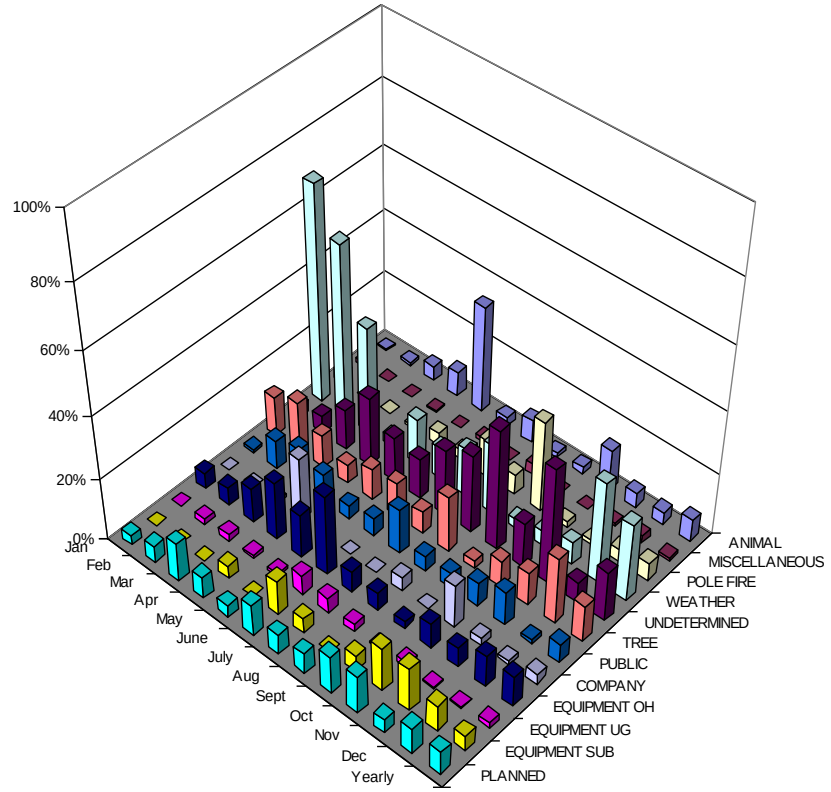
% SAIFI per Cause by Month

The following table lists the percentage SAIFI contribution by causes for all outages, excluding major event days.

Reason	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Yearly
ANIMAL	0.4%	1.0%	4.7%	7.7%	34.2%	2.9%	7.2%	1.6%	2.2%	13.2%	4.5%	3.8%	7.0%
MISCELLANEOUS	1.1%	0.0%	0.0%	0.4%	0.0%	1.3%	0.0%	3.4%	0.0%	0.0%	0.7%	2.5%	1.0%
POLE FIRE	3.6%	0.0%	0.3%	0.9%	4.0%	3.2%	11.9%	6.4%	29.2%	1.9%	1.1%	3.9%	5.8%
WEATHER	69.0%	55.4%	33.9%	3.1%	14.5%	10.2%	15.3%	22.0%	2.9%	5.0%	7.3%	32.5%	24.9%
UNDETERMINED	4.0%	5.7%	12.8%	22.2%	14.5%	12.9%	21.2%	25.0%	38.5%	14.3%	37.5%	6.6%	16.1%
TREE	12.5%	16.0%	10.3%	6.1%	10.0%	10.9%	7.2%	17.8%	2.4%	8.3%	10.6%	21.2%	11.8%
PUBLIC	0.9%	9.1%	11.9%	8.9%	4.3%	5.6%	14.3%	4.6%	4.9%	7.7%	10.8%	1.3%	6.0%
COMPANY	0.0%	0.0%	0.8%	20.2%	0.1%	0.2%	0.1%	4.3%	0.1%	13.8%	2.4%	1.2%	3.2%
EQUIPMENT OH	5.1%	5.7%	11.0%	18.5%	13.8%	25.7%	6.8%	6.0%	2.4%	8.0%	6.4%	10.1%	9.8%
EQUIPMENT UG	0.3%	1.6%	2.2%	1.1%	1.0%	6.3%	4.8%	2.3%	0.5%	1.9%	0.4%	0.4%	1.8%
EQUIPMENT SUB	0.0%	0.0%	0.0%	4.1%	0.0%	10.9%	4.7%	0.0%	5.1%	14.0%	13.9%	8.3%	5.1%
PLANNED	3.0%	5.3%	12.1%	6.8%	3.8%	9.9%	6.4%	6.7%	12.0%	11.9%	4.4%	8.3%	7.5%

The following chart shows the percentage SAIFI contribution by causes for all outages, excluding major event days.

% SAIFI



MOMENTARY INTERRUPTION CAUSES

The cause for many momentary interruptions is unknown. Because faults are temporary, the cause goes unnoticed even after the line is patrolled. Momentary outages are recorded using our SCADA system (System Control and Data Acquisition). On average, about 88% of Avista's customers are served from SCADA controlled stations.

Table 5.1 - % MAIFI per Cause by Office
The following table lists the percentage MAIFI contribution by causes for outages excluding major event days.

REASON	CDC	COC	DAC	GRC	KEC	LCC	OTC	PAC	SAC	SPC	DPC	All Offices
ANIMAL	0.0%	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.1%	1.8%	3.1%	0.0%	1.2%
POLE FIRE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.1%	0.0%	0.0%	0.9%	0.0%	0.3%
WEATHER	13.5%	3.4%	7.8%	35.1%	21.4%	9.6%	5.9%	11.7%	16.9%	19.9%	0.0%	15.9%
TREE	0.0%	0.0%	1.3%	0.5%	0.0%	0.0%	6.9%	0.0%	1.1%	0.0%	0.0%	0.3%
PUBLIC	1.7%	2.6%	0.0%	0.0%	0.0%	1.4%	0.0%	0.6%	1.2%	0.6%	0.0%	0.9%
COMPANY	1.5%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.7%	0.0%	0.5%
WEATHER	1.2%	1.8%	0.0%	4.5%	3.0%	1.1%	0.0%	0.0%	1.2%	1.1%	0.0%	1.3%
UNDETERMINED	79.8%	81.0%	90.8%	56.6%	75.6%	82.9%	74.2%	84.7%	75.3%	64.6%	0.0%	75.0%
EQUIPMENT UG	1.3%	0.0%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.9%	0.0%	0.0%	0.3%
EQUIPMENT OH	1.0%	3.4%	0.0%	0.0%	0.0%	1.1%	6.9%	2.5%	0.9%	5.5%	0.0%	2.5%
PLANNED	0.0%	7.8%	0.0%	2.1%	0.0%	0.0%	0.0%	0.4%	0.9%	2.0%	0.0%	1.3%
EQUIPMENT SUB	0.0%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.4%

Table 5.1.1 - % MAIFI per Cause by Office (Washington only)
The following table lists the percentage MAIFI contribution by causes for outages excluding major event days.

REASON	COC	DAC	OTC	SPC	DPC	PAC-WA	LCC-WA	All WA Offices
ANIMAL	2.25%	1.92%	2.05%	21.07%	4.30%	1.34%	11.31%	11.85%
COMPANY	6.27%	0.00%	0.02%	5.42%	0.00%	0.00%	0.00%	3.97%
MISCELLANEOUS	0.33%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.07%
POLE FIRE	5.10%	0.64%	10.04%	2.89%	0.80%	0.00%	12.78%	2.97%
PUBLIC	1.60%	0.43%	1.69%	10.46%	14.10%	2.21%	0.13%	6.56%
TREE	11.42%	2.32%	1.04%	7.09%	14.55%	5.68%	34.65%	8.02%
UNDETERMINED	9.48%	2.61%	5.42%	10.53%	29.51%	40.85%	9.31%	13.80%
WEATHER	20.92%	80.59%	31.37%	21.47%	22.03%	36.90%	3.90%	29.06%
EQUIPMENT OH	5.84%	6.04%	41.25%	9.30%	8.12%	6.37%	24.59%	8.71%
EQUIPMENT UG	0.77%	0.18%	0.14%	0.86%	1.81%	1.04%	0.37%	0.82%
EQUIPMENT SUB	0.00%	0.00%	0.00%	8.76%	0.00%	0.01%	0.00%	4.42%
PLANNED	36.03%	5.27%	6.98%	2.13%	4.79%	5.59%	2.96%	9.76%

Chart 5.1 – % MAIFI per Cause by Office
The following chart shows the percentage MAIFI contribution by causes for outages excluding major event days.

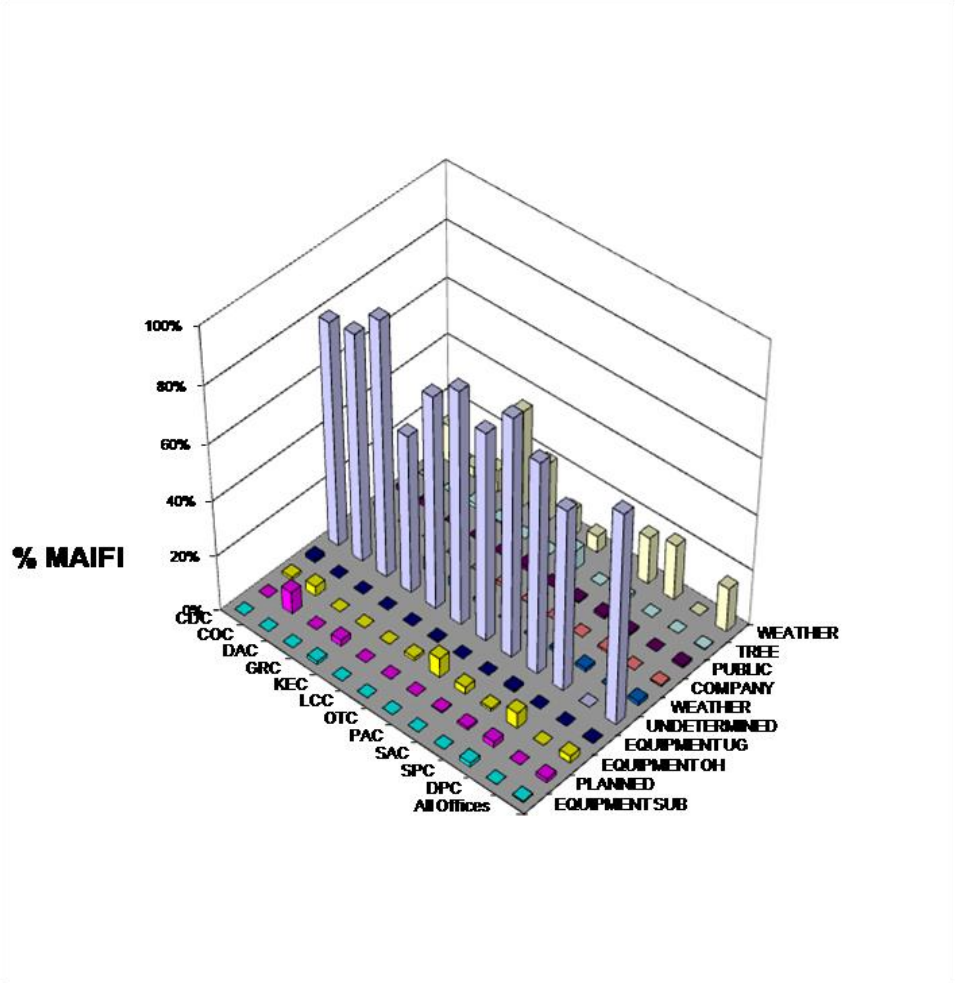
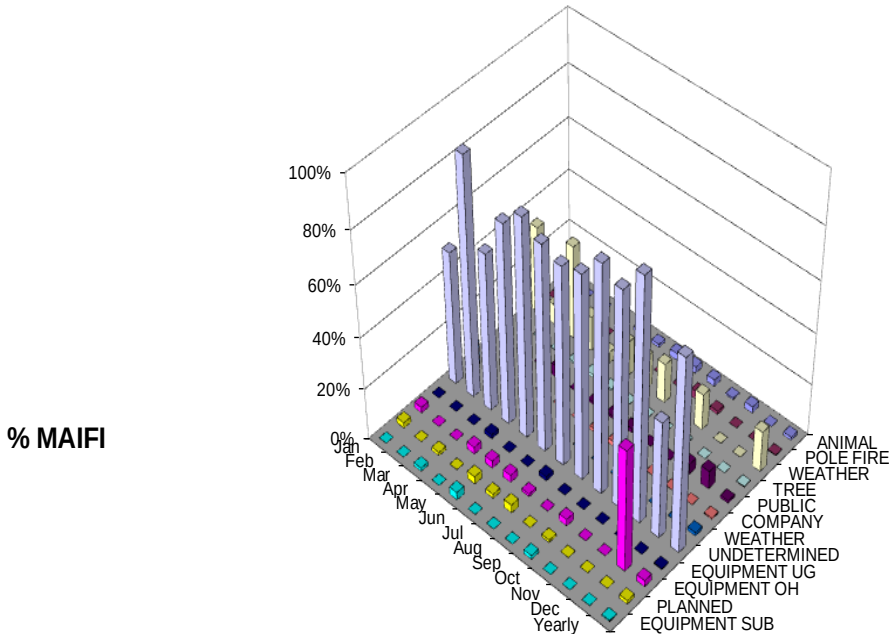


Table 5.2 - % MAIFI per Cause by Month

The following table lists the percentage MAIFI contribution by causes for outages excluding major event days.

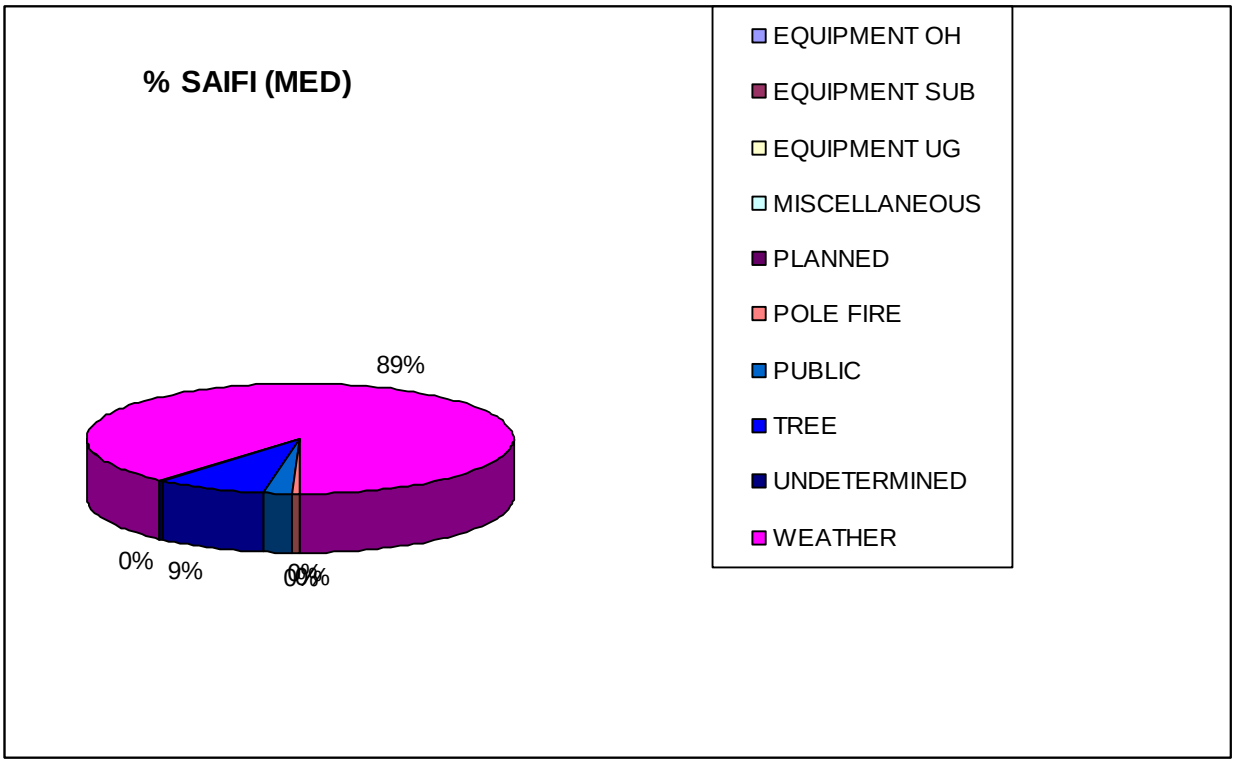
REASON	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Yearly
ANIMAL	0.0%	0.0%	0.0%	0.0%	1.6%	1.2%	2.6%	2.5%	2.6%	0.6%	2.5%	0.0%	1.2%
POLE FIRE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.1%	1.3%	0.0%	0.0%	0.3%
WEATHER	34.3%	7.9%	36.5%	13.6%	4.4%	13.6%	13.0%	15.5%	0.0%	14.1%	0.0%	0.0%	15.9%
TREE	0.0%	0.0%	0.0%	0.6%	1.1%	0.7%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	0.3%
PUBLIC	0.0%	0.0%	0.0%	4.5%	0.0%	0.7%	0.8%	1.5%	0.0%	0.0%	4.2%	7.1%	0.9%
COMPANY	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	1.9%	1.9%	0.0%	0.0%	0.0%	0.5%
WEATHER	9.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%
UNDETERMINED	51.6%	92.1%	61.0%	77.0%	84.2%	79.4%	76.4%	78.6%	87.4%	83.2%	93.3%	45.3%	75.0%
EQUIPMENT UG	0.0%	0.0%	0.0%	1.6%	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%
EQUIPMENT OH	2.2%	0.0%	0.0%	2.8%	2.8%	2.8%	1.0%	0.0%	2.6%	0.0%	0.0%	47.6%	2.5%
PLANNED	2.1%	0.0%	1.3%	0.0%	2.9%	1.6%	3.1%	0.0%	0.9%	0.0%	0.0%	0.0%	1.3%
EQUIPMENT SUB	0.0%	0.0%	1.3%	0.0%	3.0%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	0.4%

Chart 5.2 – % MAIFI per Cause by Month
The following chart shows the percentage MAIFI contribution by causes for outages excluding major event days.



MAJOR EVENT DAY CAUSES

% SAIFI by Cause Code for the Major Event Days
The following chart shows the percentage SAIFI contribution by causes for outages during major event days



All charts and tables in this section are provided for illustrative purposes; the Company may change the future presentation of this information without changing the underlying data.

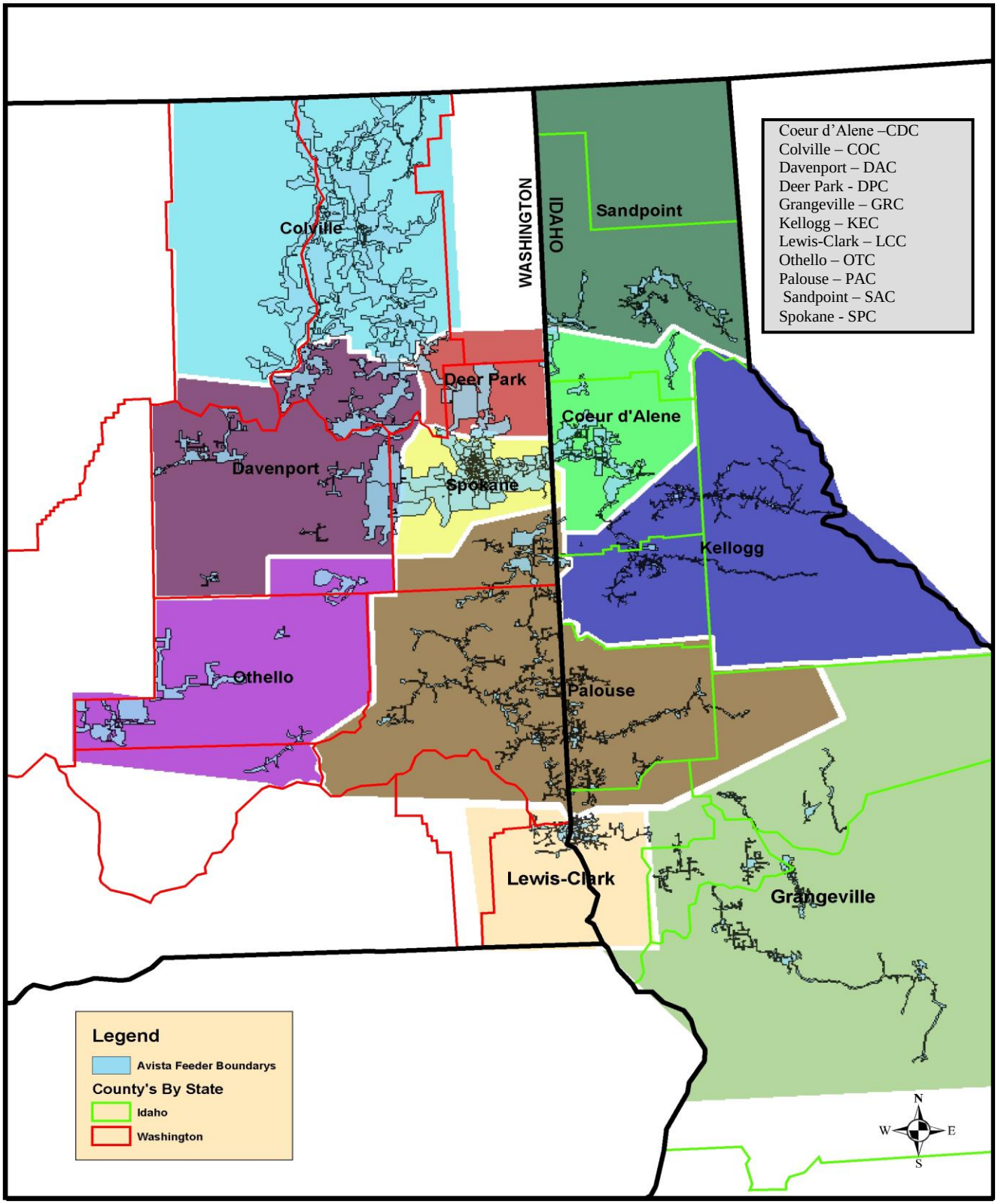
INTERRUPTION CAUSE CODES

The Company's current table of Cause Codes is as follows:

MAIN CATEGORY *Proposed (Changes Only)*	**SUB CATEGORY** **Proposed** (Changes Only)	**Definition**
ANIMAL	Bird	Outages caused by animal contacts. Specific animal called out in sub category.
	Protected	
	Squirrel	
	Underground	
	Other	
PUBLIC	Car Hit Pad	Underground outage due to car, truck, construction equipment etc. contact with pad transformer, junction enclosure etc...
	Car Hit Pole	Overhead outage due to car, truck, construction equipment etc. contact with pole, guy, neutral etc.
	Dig In	Dig in by a customer, a customer's contractor, or another utility.
	Fire	Outages caused by or required for a house/structure or field/forest fire.
	Tree	Homeowner, tree service, logger etc. fells a tree into the line.
	Other	Other public caused outages
COMPANY	Dig in	Dig in by company or contract crew.
	Other	Other company caused outages
EQUIPMENT OH	Arrestors	Outages caused by equipment failure. Specific equipment called out in sub category.
	Capacitor	
	Conductor - Pri	
	Conductor - Sec	
	Connector - Pri	
	Connector - Sec	
	Crossarm- rotten	
	Cutout / Fuse	
	Insulator	
	Insulator Pin	
	Other	
	Pole - Rotten	
	Recloser	
	Regulator	
	Switch / Disconnect	
	Transformer - OH	
	Wildlife Guard	Wildlife guard failed or caused an outage
EQUIPMENT UG	URD Cable - Pri	Outages caused by equipment failure. Specific equipment called out in sub category.
	URD Cable- Sec	
	Connector - Sec	
	Elbow	
	Junctions	
	Primary Splice	
	Termination	
	Transformer - UG	

	Other	
EQUIPMENT SUB	High side fuse Bus Insulator High side PCB High side Swt / Disc Low side OCB/Recloser Low side Swt / Disc Relay Misoperation Regulator Transformer Other	
MISCELLANEOUS	SEE REMARKS	For causes not specifically listed elsewhere
NOT OUR PROBLEM (*Outages in this category are not included in reported statistics*)	Customer Equipment SEE REMARKS Other Utility	Customer equipment causing an outage to their service. If a customer causes an outage to another customer this is covered under Public. Outages when another utility's facilities cause an outage on our system.
POLE FIRE		Used when water and contamination causes insulator leakage current and fire. If insulator is leaking due to material failure list under equipment failure. If cracked due to gunfire use customer caused other.
PLANNED	Maintenance / Upgrade Forced	Outage, normally prearranged, needed for normal construction work Outage scheduled to repair outage damage
TREE	Tree fell Tree growth Service Weather	For outages when a tree falls into distribution primary/secondary or transmission during normal weather Tree growth causes a tree to contact distribution primary/secondary or transmission during normal weather. For outages when a tree falls or grows into a service. When snow and wind storms causes a tree or branch to fall into, or contact the line. Includes snow loading and unloading.
UNDETERMINED		Use when the cause cannot be determined
WEATHER	Snow / Ice Lightning Wind	Outages caused by snow or ice loading or unloading on a structure or conductor. Use weather tree for snow and ice loading on a tree. Lightning flashovers without equipment damage. Equipment failures reported under the equipment type. Outages when wind causes conductors to blow into each other, another structure, building etc.

OFFICE AREAS



INDICES CALCULATIONS

SAIFI – System Average Interruption Frequency Index

- The average number of sustained interruptions per customer
- = The number of customers which had ***sustained interruptions***
  Total number of customers served
- = $\frac{\sum N_i}{N_T}$

MAIFI – Momentary Average Interruption Frequency Index

- The average number of momentary interruption events per customer
- = The number of customers which had ***momentary interruptions***
  Total number of customers served
- = $\frac{\sum ID_E N_i}{N_T}$
- MAIFI can be calculated by one of two methods. Using the number of momentary interruptions or the number momentary events. This report calculates MAIFI using momentary interruptions. The interruptions include all momentary interruptions occurring within 5 minutes.

SAIDI – System Average Interruption Duration Index

- Average sustained outage time per customer
- = Outage duration multiplied by the customers effected for all ***sustained interruptions***
  Total number of customers served
- = $\frac{\sum r_i N_i}{N_T}$

CAIDI – Customer Average Interruption Duration Index

- Average restoration time
- = Outage duration multiplied by the customers effected for all ***sustained interruptions***
  The number of customers which had ***sustained interruptions***
- = $\frac{\sum r_i N_i}{\sum N_i}$

Quantities
i = An interruption event;
r_i = Restoration time for each interruption event;
T = Total;
ID_E = Number of interrupting device events;
N_i = Number of interrupted customers for each interruption event during the reporting period;
N_T = Total number of customers served for the area being indexed;

$CEMI_n$ – Customers Experiencing Multiple Sustained Interruptions more than n.

- $CEMI_n$
- = Total Number of Customers that experience more than *n* **sustained interruptions** / Total Number of Customers Served
- = $\frac{CN_{(k>n)}}{N_T}$

$CEMSMI_n$ – Customers experiencing multiple sustained interruption and momentary interruption events.

- CEMSMIn
- = Total Number of Customers experiencing more than *n* **interruptions** / Total Number of Customers Served
- = $\frac{CNT_{(k>n)}}{N_T}$

MED - Major Event Day

A major event day is a day in which the daily system SAIDI exceeds a threshold value. Its purpose is to allow major events to be studied separately from daily operation, and in the process, to better reveal trends in daily operation that would be hidden by the large statistical effect of major events.

T_{MED} is calculated (taken from the IEEE 1366-2003 Standard)
The major event day identification threshold value, T_{MED}, is calculated at the end of each reporting period (typically one year) for use during the next reporting period as follows:

a) Collect values of daily SAIDI for five sequential years ending on the last day of the last complete reporting period. If fewer than five years of historical data are available, use all available historical data until five years of historical data are available.
b) Only those days that have a SAIDI/Day value will be used to calculate the T_{MED} (do not include days that did not have any interruptions).
c) Take the natural logarithm (ln) of each daily SAIDI value in the data set.
d) Find a(Alpha), the average of the logarithms (also known as the log-average) of the data set.
e) Find b(Beta), the standard deviation of the logarithms (also known as the log-standard deviation) of the data set.
f) Compute the major event day threshold, TMED, using equation (25).

$$T_{MED} = e^{\langle a + 2.5\, b \rangle} \qquad (25)$$

g) Any day with daily SAIDI greater than the threshold value TMED that occurs during the subsequent reporting period is classified as a major event day. Activities that occur on days classified as major event days should be separately analyzed and reported.

NUMBERS OF CUSTOMERS SERVED

The following numbers of customers were based on the customers served at the beginning of the report year. The numbers are used to calculate indices for the report.

Office	Customers	% of Total
Coeur d'Alene	50118	13.9%
Colville	18059	5.0%
Davenport	6911	1.9%
Deer Park	10451	2.9%
Grangeville	10165	2.8%
Kellogg/St. Maries	14283	4.0%
Lewis-Clark	29231	8.1%
Othello	6686	1.9%
Palouse	38067	10.5%
Sandpoint	14583	4.0%
Spokane	162389	45.0%
System Total	**360943**	

ATTACHMENT 1 – SAIDI and SAIFI HISTORICAL SUMMARY

See attachment.

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