



**WASHINGTON  
SERVICE QUALITY  
REVIEW**

**January 1 – December 31, 2017**

**Annual Report**

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## **EXECUTIVE SUMMARY**

During January 1 through December 31, 2017, Pacific Power delivered reliable service to its Washington customers. The level of performance met established baselines. Also, the Customer Guarantee program continued to deliver high quality results consistent with the prior year's performance. The Company has noted in the past that the service it delivers ranks high when compared across the industry.

The Company's service reliability can be impacted by uncontrollable interference events, such as car-hit-pole accidents, and by significant events that exceed the normal underlying level of interruptions but that do not reach the qualifying major event threshold for exclusion from the Company's underlying performance metrics. To provide a perspective on their impact during the reporting period, the significant events experienced during 2017 are listed in Section 3.2. Consideration of the root causes of these significant days is important when evaluating year-on-year performance. When the Company develops reliability improvement projects it evaluates these root causes and prepares plans that reflect the certainty of repetition of these events. The outcomes are reflective of the plans outlined in the Areas of Great Concern, shown in Section 3.6.

### **1 Service Standards Program Summary**

Pacific Power has a number of Customer Service Standards and Service Quality Measures with performance reporting mechanisms currently in place. These standards and measures define Pacific Power's target performance (both personnel and network reliability performance) in delivering quality customer service. The Company developed these standards and measures using relevant industry standards for collecting and reporting performance data. In some cases, Pacific Power has expanded upon these standards. In other cases, largely where the industry has no established standards, Pacific Power has developed metrics, targets and reporting. While industry standards are not focused around threshold performance levels, the Company has developed targets or performance levels against which it evaluates its performance. These standards and measures can be used over time, both historically and prospectively, to measure the service quality delivered to our customers. In its entirety, these measures comply with WAC 480-100-393 and 398 requirements for routine reliability reporting.

In UE-042131, the Company applied for, and received approval, to extend the core program through March 31, 2008. During the MidAmerican acquisition of Pacific Power, in UE-051090, the program was extended again through 2011. While the term of this program has lapsed, the Company has continued to perform all programs as performed historically. No actions have been taken by the Company to recommend any suspension or changes to the program that was extended in UE-042131.

## 1.1 Pacific Power Customer Guarantees

<u>Customer Guarantee 1:</u> Restoring Supply After an Outage	The Company will restore supply after an outage within 24 hours of notification from the customer with certain exceptions as described in Rule 25.
<u>Customer Guarantee 2:</u> Appointments	The Company will keep mutually agreed upon appointments which will be scheduled within a two-hour time window.
<u>Customer Guarantee 3:</u> Switching on Power	The Company will switch on power within 24 hours of the customer or applicant's request, provided no construction is required, all government inspections are met and communicated to the Company and required payments are made. Disconnections for nonpayment, subterfuge or theft/diversion of service are excluded.
<u>Customer Guarantee 4:</u> Estimates For New Supply	The Company will provide an estimate for new supply to the applicant or customer within 15 working days after the initial meeting and all necessary information is provided to the Company.
<u>Customer Guarantee 5:</u> Respond To Billing Inquiries	The Company will respond to most billing inquiries at the time of the initial contact. For those that require further investigation, the Company will investigate and respond to the Customer within 10 working days.
<u>Customer Guarantee 6:</u> Resolving Meter Problems	The Company will investigate and respond to reported problems with a meter or conduct a meter test and report results to the customer within 10 working days.
<u>Customer Guarantee 7:</u> Notification of Planned Interruptions	The Company will provide the customer with at least two days' notice prior to turning off power for planned interruptions consistent with Rule 25 and relevant exemptions.

*Note: See Rules for a complete description of terms and conditions for the Customer Guarantee Program.*

## 1.2 Pacific Power Performance Standards<sup>1</sup>

<u>Network Performance Standard 1:</u> Improve System Average Interruption Duration Index (SAIDI)	The Company will maintain SAIDI commitment target.
<u>Network Performance Standard 2:</u> Improve System Average Interruption Frequency Index (SAIFI)	The Company will maintain SAIFI commitment target.
<u>Network Performance Standard 3:</u> Improve Under Performing Circuits	The Company will reduce by 20% the circuit performance indicator (CPI) for a maximum of five under-performing circuits on an annual basis within five years after selection.
<u>Network Performance Standard 4:</u> Supply Restoration	The Company will restore power outages due to loss of supply or damage to the distribution system within three hours to 80% of customers on average.
<u>Customer Service Performance Standard 5:</u> Telephone Service Level	The Company will answer 80% of telephone calls within 30 seconds. The Company will monitor customer satisfaction with the Company's Customer Service Associates and quality of response received by customers through the Company's eQuality monitoring system.
<u>Customer Service Performance Standard 6:</u> Commission Complaint Response/Resolution	The Company will: a) respond to at least 95% of non-disconnect Commission complaints within two working days per state administrative code <sup>2</sup> ; b) respond to at least 95% of disconnect Commission complaints within four working hours; and c) resolve 95% of informal Commission complaints within 30 days.

*Note: Performance Standards 1, 2 & 4 are for underlying performance days, excluding days classified as Major Events.*

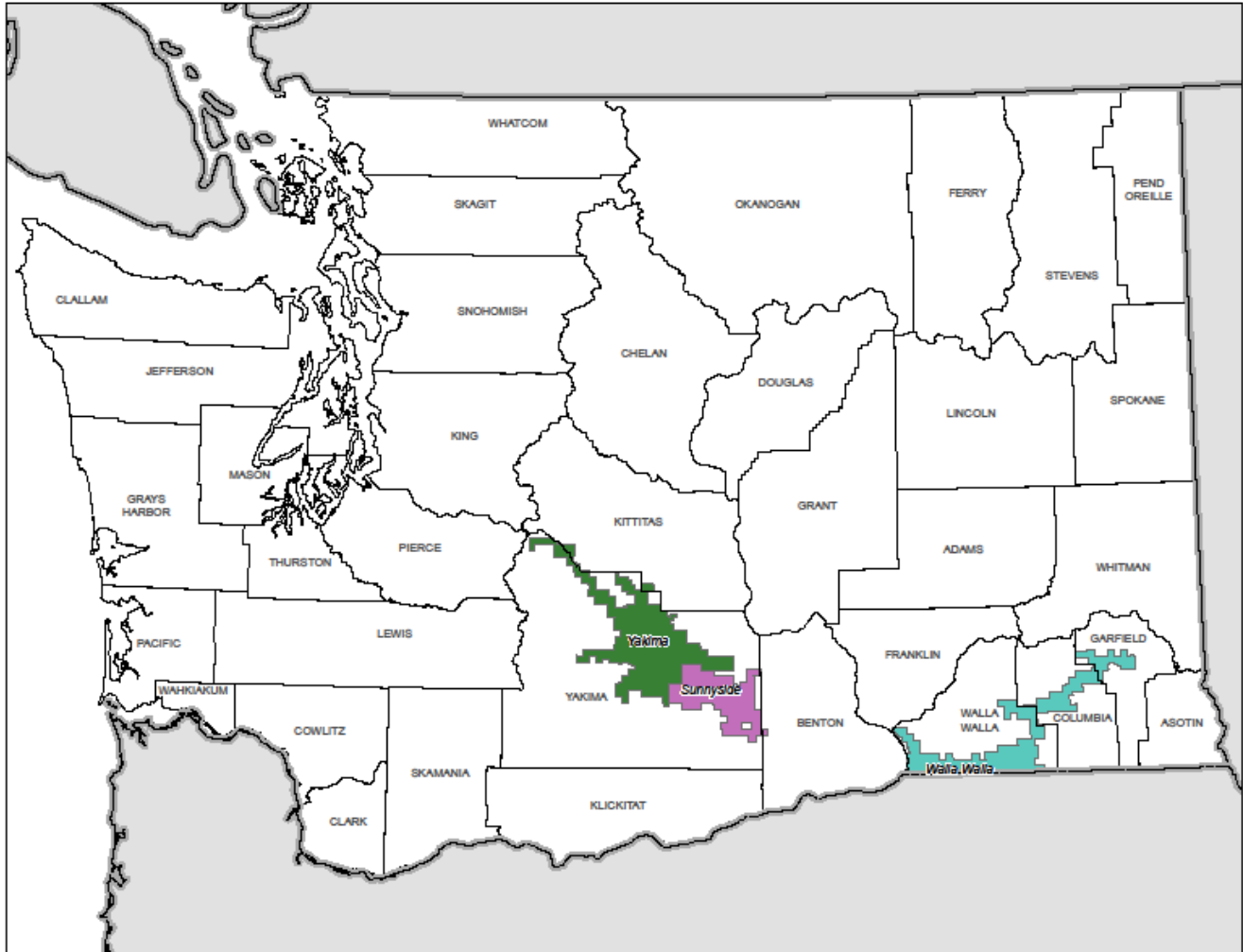
<sup>1</sup> The Company committed to Service Standards Programs that expired on 12/31/2011; during the program all elements committed to were delivered successfully. By terms of the commitment any changes to the program required the approval of the Commission. The Company has proposed no changes to the program, but continues at this time, to operate consistently with its historical program. State reliability reporting rules establish requirements that the Company interprets as generally encompassing the requirements of Network Performance Standards 1-3.

<sup>2</sup> Although the Performance Standard indicates that complaints will be responded to within 3 days, the Company acknowledges and adheres to the requirements set forth in 480-100-173(3)(a).

### 1.3 Service Territory

#### Service Territory Map

Contained below is a graphic of the Company’s Washington service territory, colored by operating area.



## 2 CUSTOMER GUARANTEES SUMMARY

Description	2017				2016			
	Events	Failures	% Success	Paid	Events	Failures	% Success	Paid
CG1 Restoring Supply	103,535	0	100.00%	\$0	85,726	0	100.00%	\$0
CG2 Appointments	1,732	1	99.94%	\$50	1,772	0	100.00%	\$0
CG3 Switching on Power	2,534	0	100.00%	\$0	2,619	1	99.96%	\$50
CG4 Estimates	314	3	99.04%	\$150	286	4	98.60%	\$200
CG5 Respond to Billing Inquiries	468	0	100.00%	\$0	293	0	100.00%	\$0
CG6 Respond to Meter Problems	295	0	100.00%	\$0	143	0	100.00%	\$0
CG7 Notification of Planned Interruptions	4,437	0	100.00%	\$0	2,833	2	99.93%	\$100
	<b>113,315</b>	<b>4</b>	<b>99.99%</b>	<b>\$200</b>	<b>93,672</b>	<b>7</b>	<b>99.99%</b>	<b>\$350</b>

(Major Events are excluded from the Customer Guarantees program.)

Overall guarantee performance remains above 99%, demonstrating Pacific Power’s continued commitment to customer satisfaction.

Customer Communications: The Customer Guarantee program was highlighted throughout the year in customer communications as follows:

- performance reports are included in June's billing statements
- the program is highlighted in Voices
- the program is highlighted in the Company's newsletter
- each new customer is mailed a welcome aboard pamphlet that features the program and how to file a claim
- Pacific Power's website features the program with information for our customers

### 3 RELIABILITY PERFORMANCE

During the reporting period, the Company’s reliability compared favorably to its baseline performance level as established in 2003. This year’s “Major Events Excluded As Reported” SAIDI performance of 114 minutes was much better than the approved SAIDI baseline of 150 minutes, while the year’s “Major Events Excluded As Reported” SAIFI performance of 0.876 events was also much better than the approved SAIFI baseline of 0.975 events. Various reliability metrics are shown below providing a historical perspective, including an additional 5-year rolling average metric.

#### 3.1 Multi-Year Historical Performance

Year	Major Events Included <sup>1</sup>		SAIDI Based Major Events Excluded 2.5 beta		SAIFI Based Major Events Excluded 10% Op Area <sup>2</sup>		SAIDI & SAIFI-Based Major Events Excluded As Reported (2.5 beta effective 2005)		Normalized Historic Performance <sup>3</sup>		5 Year Rolling Average Performance	
	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI	SAIFI
2002	183	0.881	86	0.691	109	0.726	107	0.795	86	0.691	99	0.741
2003	126	1.062	91	0.933	89	0.539	98	0.954	89	0.539	97	0.761
2004	172	1.024	87	0.712	119	0.726	123	0.851	87	0.712	93	0.736
2005	128	0.851	110	0.810	121	0.761	111	0.812	110	0.761	103	0.808
2006	242	1.259	120	0.980	187	0.891	122	0.985	120	0.891	112	0.879
2007	146	1.169	122	1.116	114	0.853	122	1.115	114	0.853	115	0.943
2008	329	1.756	127	1.323	124	0.881	131	1.331	124	0.881	122	1.019
2009	182	1.128	161	1.042	162	0.857	161	1.044	161	0.857	129	1.057
2010	107	0.862	107	0.862	97	0.601	103	0.688	97	0.601	128	1.033
2011	91	0.587	80	0.549	91	0.587	80	0.550	80	0.549	119	0.946
2012	158	0.986	100	0.664	100	0.664	100	0.664	100	0.664	115	0.855
2013	198	1.048	113	0.791	192	1.017	107	0.760	107	0.791	110	0.741
2014	146	0.862	122	0.793	146	0.862	122	0.793	122	0.793	112	0.750
2015	154	1.176	100	0.845	149	1.075	95	0.744	95	0.845	101	0.700
2016	116	1.204	103	1.156	98	0.693	85	0.643	85	0.693	102	0.721
2017	253	1.2281	124	0.876	243	1.113	114	0.760	114	0.876	105	0.740

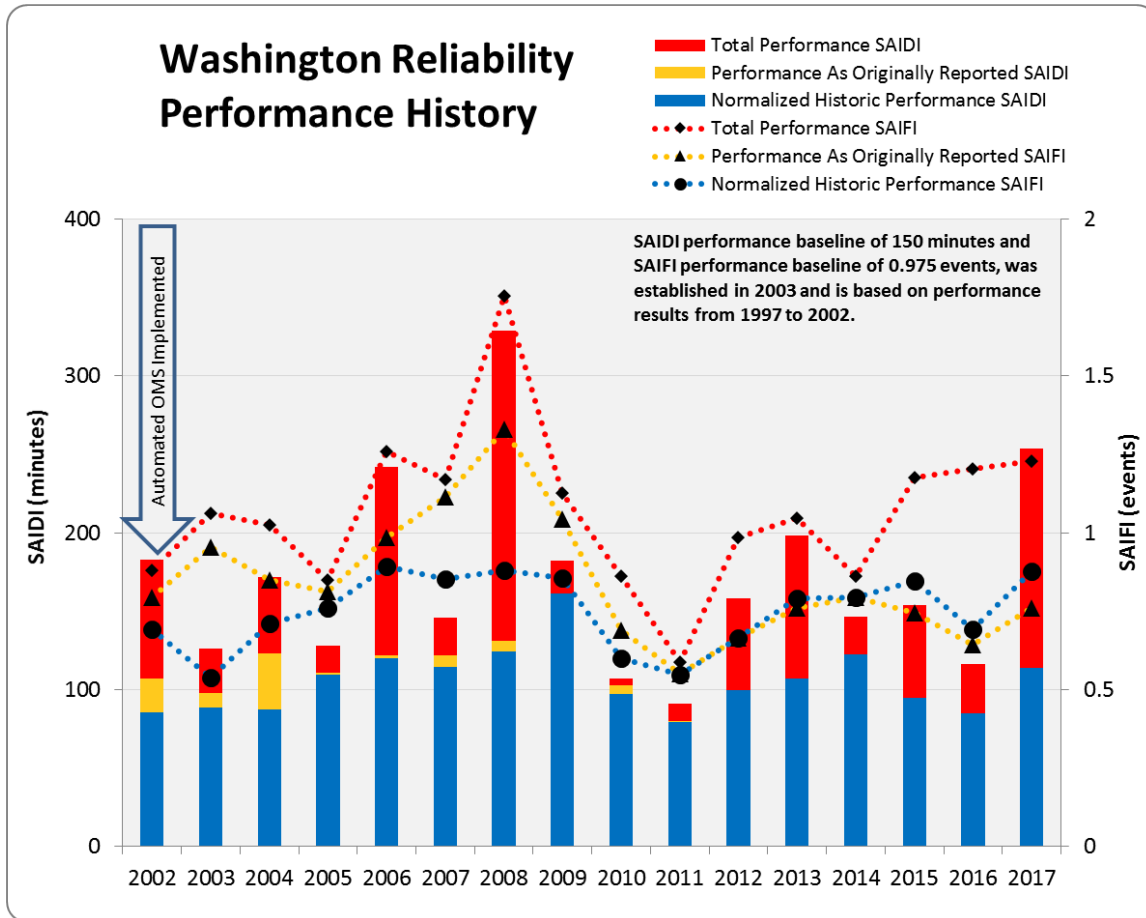
<sup>1</sup>Customer requested and pre-arranged outages are not reported in these metrics

<sup>2</sup>If a 10% op area major event also qualified as a 2 1/2 beta major event it was associated only with the 2 1/2 beta major event.

<sup>3</sup>Normalized performance is the result of applying both SAIDI and SAIFI-based major events to establish underlying performance

<sup>4</sup>Performance baselines were established in June 2003 based on performance between 1997 and 2002. See page 3 of Reporting Plan. SAIDI performance baseline of 150 minutes and SAIFI performance baseline of 0.975 events.





### 3.2 System Average Interruption Duration Index (SAIDI)

In 2017, the Company delivered reliability results much better than baseline for both outage duration (SAIDI) and outage frequency (SAIFI); the performance compared to baselines is identified in Section 3.1 above.

The Company's reporting plan recognizes two types of major events; the first, a SAIDI-based major event<sup>1</sup> is defined using statistical methods as outlined in IEEE 1366-2003/2012 while the second, a SAIFI-based major event is defined in the company's reporting plan. During the year, one SAIDI-based and seven SAIFI-based<sup>2</sup> major events were recorded. The events designate 30.8 minutes to be excluded from underlying reporting metrics. Copies of the Company's filed major events are included in the Appendix of this report.

2017 Major Events			
Date	Cause	SAIDI	SAIFI
* January 16 2017	Loss of Transmission	3.3	0.033
June 4, 2017	Animal Interference	25.0	0.048
October 21-22, 2017	Pole Fires	17.3	0.112
November 7, 2017	Loss of Transmission	23.8	0.150
December 29-31, 2017	Ice Storm	69.9	0.124
<b>SAIDI Based Major Event Total</b>		<b>136.0</b>	<b>0.435</b>
<b>* SAIFI Based Major Event Total</b>		<b>3.3</b>	<b>0.033</b>
<b>TOTAL</b>		<b>139.3</b>	<b>0.468</b>

\* SAIFI Based Major event

During the period, there were ten significant event days<sup>3</sup> (daily underlying SAIDI of 2.1 minutes or more). These ten days account for 41 SAIDI minutes and 0.152 SAIFI events, representing 43% of the underlying SAIDI and 20% of the underlying SAIFI.

SIGNIFICANT EVENT DAYS					
DATE	PRIMARY CAUSE	SAIDI	SAIFI	% Underlying SAIDI (114 min)	% Underlying SAIFI (0.760 events)
April 7, 2017	Windstorm	6.3	0.038	7%	5%
May 13, 2017	Animal interference and car hit pole	5.5	0.027	6%	4%
May 24, 2017	Car hit pole and failed cut out	2.8	0.010	3%	1%
May 30, 2017	weather related tree and pole fire events	4.1	0.019	4%	3%
June 2, 2017	Loss of substation	3.0	0.007	3%	1%
June 19, 2017	Car hit pole	2.9	0.011	3%	1%
June 27, 2017	Equipment failure	5.0	0.006	5%	1%
June 28, 2017	Brush fire caused burnt poles	2.9	0.013	3%	2%
August 13, 2017	Failed capacitor bank	4.1	0.013	4%	2%
August 29, 2017	Fire caused downed line	4.7	0.008	5%	1%
<b>TOTAL</b>		<b>41.1</b>	<b>0.152</b>	<b>43%</b>	<b>20%</b>

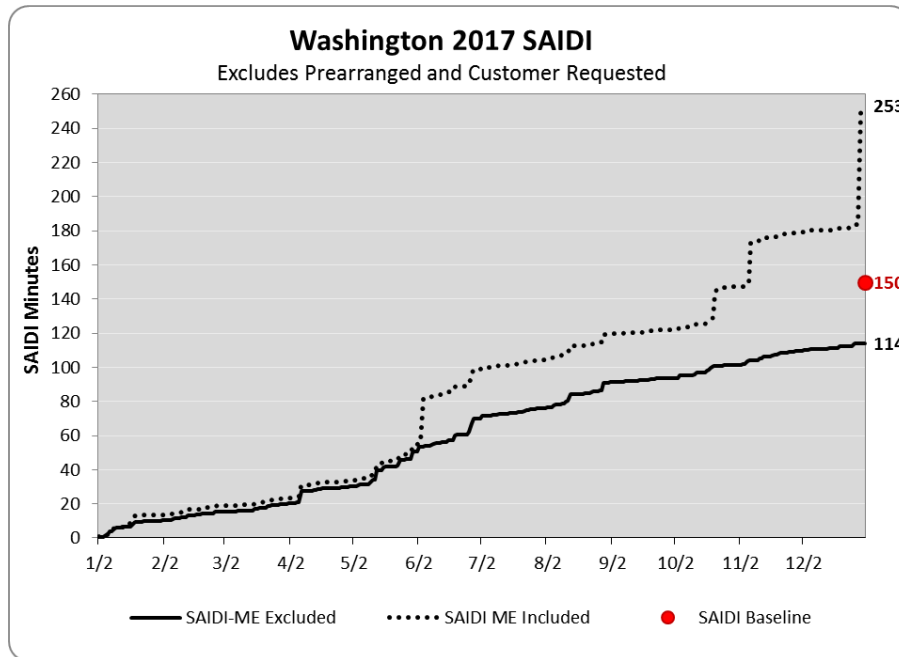
Through 2017, outage duration, or SAIDI was below baseline.

<sup>1</sup> During calendar 2017, the calculated threshold for a major event was 10.77 SAIDI Minutes; for 2018, it will be 10.98 SAIDI minutes.

<sup>2</sup> The SAIFI-based major event combines Sunnyside and Yakima operational areas.

<sup>3</sup> On a trial basis, the Company established a variable of 1.75 times the standard deviation of its natural log SAIDI results to identify significant event days; generally they are triggered by weather, however may also be the result of significant transmission system events.

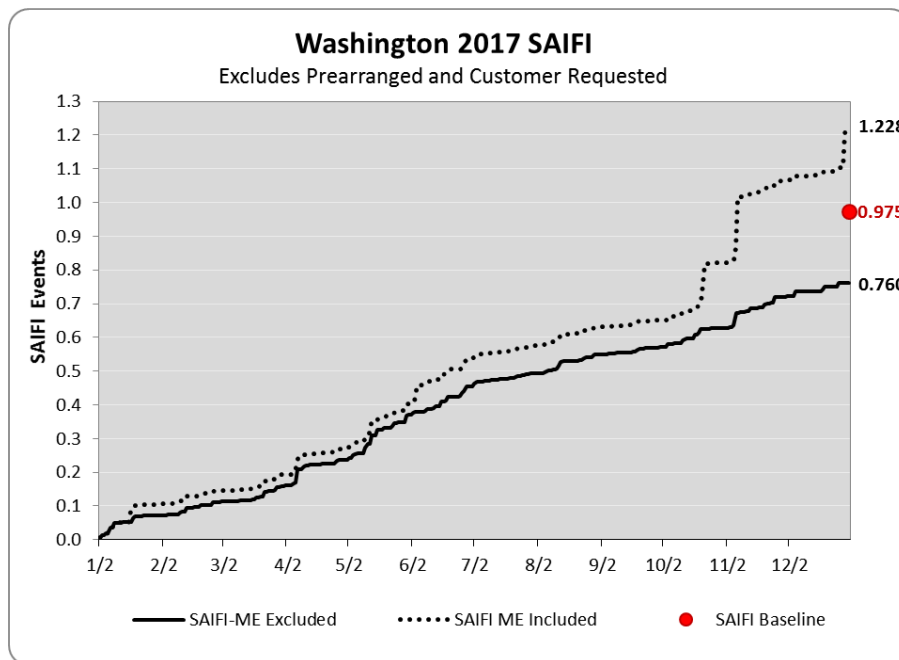
January 1 through December 31, 2017	
2017 SAIDI Goal = 88	SAIDI Actual
Total Performance	253
SAIDI-based Major Events Excluded	136
SAIFI-based Major Events Excluded	3
<b>Reported Major Events Excluded</b>	<b>114</b>



### 3.3 System Average Interruption Frequency Index (SAIFI)

Through 2017 outage frequency or SAIFI was better than baseline.

January 1 through December 31, 2017	
2017 SAIFI Goal = 0.746	SAIFI Actual
Total Performance	1.228
SAIDI-based Major Events Excluded	0.435
SAIFI-based Major Events Excluded	0.033
<b>Reported Major Events Excluded</b>	<b>0.760</b>



### 3.4 Operating Area Metrics

Washington operating area performance metrics for the reporting period are listed in the table below.

January 1 – December 31, 2017	Sunnyside			Walla Walla <sup>1</sup>			Yakima		
	SAIDI	SAIFI	CAIDI	SAIDI	SAIFI	CAIDI	SAIDI	SAIFI	CAIDI
Including Major Events	284	1.133	251	508	1.785	285	157	1.048	150
Excluding SAIDI-based Major Events	147	0.316	466				32	0.206	157
Excluding SAIFI-based Major Events				443	1.302	340			
<b>Reported Major Events Excluded</b>	<b>137</b>	<b>0.816</b>	<b>167</b>	<b>65</b>	<b>0.483</b>	<b>134</b>	<b>125</b>	<b>0.842</b>	<b>148</b>

2017 Sunnyside Customer Count: 24,522  
 2017 Walla Walla Customer Count: 28,387  
 2017 Yakima Customer Count: 81,281

<sup>1</sup> The district metrics for Walla Walla include a small amount of Oregon customers served from two circuits originating in Washington.

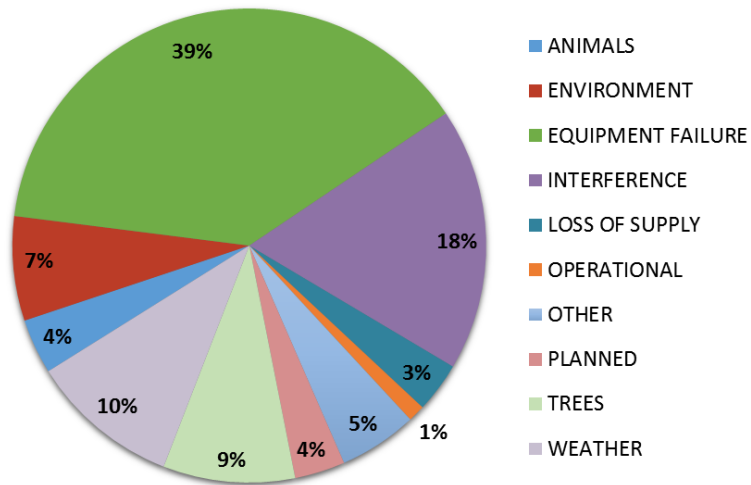
### 3.5 Cause Code Analysis

The table and charts below break out the number of outage incidents, customer minutes lost (CML), and sustained interruptions by cause code. CML is directly related to SAIDI (average outage duration); Sustained Interruptions is directly related to SAIFI (average outage frequency). Certain types of outages typically result in high duration, but are infrequent, such as Loss of Supply outages. Others tend to be more frequent, but are generally shorter in duration. The pie charts depict the breakdown of performance results by percentage of each cause category. Following the pie charts, a cause category table lists the direct causes with definitions and examples. Thereafter is a historical view of cause codes, as they summarize to annual SAIDI and SAIFI performance.

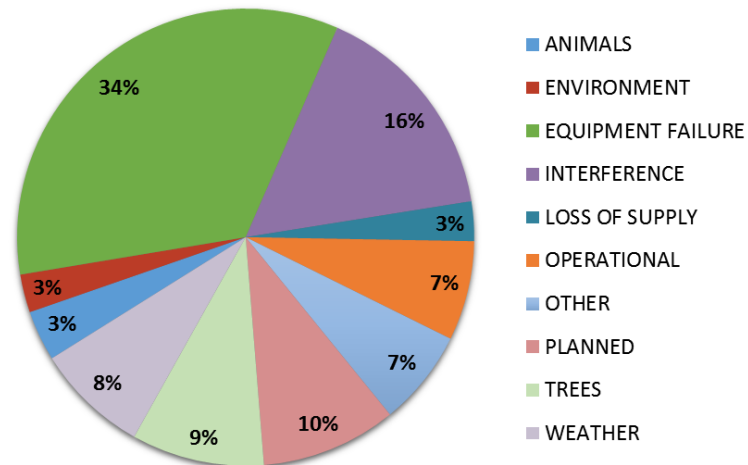
Washington Cause Analysis - Underlying 01/01/2017 - 12/31/2017					
Direct Cause	Customer Minutes Lost for Incident	Customers in Incident Sustained	Sustained Incident Count	SAIDI	SAIFI
ANIMALS	362,079	1,669	133	2.7	0.012
BIRD MORTALITY (NON-PROTECTED SPECIES)	58,291	589	198	0.4	0.004
BIRD MORTALITY (PROTECTED SPECIES) (BMTS)	76,796	485	8	0.6	0.004
BIRD SUSPECTED, NO MORTALITY	79,342	903	24	0.6	0.007
<b>ANIMALS</b>	<b>576,509</b>	<b>3,646</b>	<b>363</b>	<b>4.3</b>	<b>0.027</b>
FIRE/SMOKE (NOT DUE TO FAULTS)	1,089,806	2,753	8	8.1	0.021
<b>ENVIRONMENT</b>	<b>1,089,806</b>	<b>2,753</b>	<b>8</b>	<b>8.1</b>	<b>0.021</b>
B/O EQUIPMENT	2,313,403	12,692	354	17.2	0.095
DETERIORATION OR ROTTING	2,345,090	12,059	505	17.5	0.090
NEARBY FAULT	398	8	1	0.0	0.000
OVERLOAD	140,571	1,833	15	1.0	0.014
POLE FIRE	1,105,448	8,295	87	8.2	0.062
STRUCTURES, INSULATORS, CONDUCTOR	2,829	5	7	0.0	0.000
<b>EQUIPMENT FAILURE</b>	<b>5,907,740</b>	<b>34,892</b>	<b>969</b>	<b>44.0</b>	<b>0.260</b>
DIG-IN (NON-PACIFICORP PERSONNEL)	33,300	111	11	0.2	0.001
OTHER INTERFERING OBJECT	20,112	102	14	0.1	0.001
OTHER UTILITY/CONTRACTOR	98,796	877	13	0.7	0.007
VANDALISM OR THEFT	72,862	312	8	0.5	0.002
VEHICLE ACCIDENT	2,522,302	14,837	76	18.8	0.111
<b>INTERFERENCE</b>	<b>2,747,372</b>	<b>16,239</b>	<b>122</b>	<b>20.5</b>	<b>0.121</b>
LOSS OF SUBSTATION	369,044	776	2	2.8	0.006
LOSS OF TRANSMISSION LINE	155,005	2,081	2	1.2	0.016
<b>LOSS OF SUPPLY</b>	<b>524,049</b>	<b>2,857</b>	<b>4</b>	<b>3.9</b>	<b>0.021</b>
FAULTY INSTALL	155	1	1	0.0	0.000
INCORRECT RECORDS	333	3	3	0.0	0.000
INTERNAL CONTRACTOR	97,999	2,307	3	0.7	0.017
PACIFICORP EMPLOYEE - FIELD	125	1	1	0.0	0.000
SWITCHING ERROR	77,753	4,873	4	0.6	0.036
<b>OPERATIONAL</b>	<b>176,364</b>	<b>7,185</b>	<b>12</b>	<b>1.3</b>	<b>0.054</b>
OTHER, KNOWN CAUSE	87,646	1,218	30	0.7	0.009
UNKNOWN	730,727	5,726	183	5.4	0.043
<b>OTHER</b>	<b>818,372</b>	<b>6,944</b>	<b>213</b>	<b>6.1</b>	<b>0.052</b>
CONSTRUCTION	698	12	2	0.0	0.000
CUSTOMER NOTICE GIVEN	408,930	4,437	263	3.0	0.033
EMERGENCY DAMAGE REPAIR	485,342	9,465	109	3.6	0.071
INTENTIONAL TO CLEAR TROUBLE	40,765	320	8	0.3	0.002
PLANNED NOTICE EXEMPT	77,955	1,482	16	0.6	0.011
<b>PLANNED</b>	<b>1,013,690</b>	<b>15,716</b>	<b>398</b>	<b>7.6</b>	<b>0.117</b>
TREE - NON-PREVENTABLE	1,320,080	9,221	138	9.8	0.069
TREE - TRIMMABLE	57,283	358	28	0.4	0.003
<b>TREES</b>	<b>1,377,363</b>	<b>9,579</b>	<b>166</b>	<b>10.3</b>	<b>0.071</b>

<b>Washington Cause Analysis - Underlying 01/01/2017 - 12/31/2017</b>					
<b>Direct Cause</b>	<b>Customer Minutes Lost for Incident</b>	<b>Customers in Incident Sustained</b>	<b>Sustained Incident Count</b>	<b>SAIDI</b>	<b>SAIFI</b>
FREEZING FOG & FROST	1,678	24	4	0.0	0.000
ICE	41,894	333	8	0.3	0.002
LIGHTNING	251,625	1,484	56	1.9	0.011
SNOW, SLEET AND BLIZZARD	53,714	213	8	0.4	0.002
WIND	1,215,734	6,107	46	9.1	0.046
<b>WEATHER</b>	<b>1,564,646</b>	<b>8,161</b>	<b>122</b>	<b>11.7</b>	<b>0.061</b>
<b>Washington Including Prearranged</b>	<b>15,795,911</b>	<b>107,972</b>	<b>2,377</b>	<b>117.7</b>	<b>0.805</b>
<b>Washington Excluding Prearranged</b>	<b>15,309,026</b>	<b>102,053</b>	<b>2,098</b>	<b>114.1</b>	<b>0.760</b>

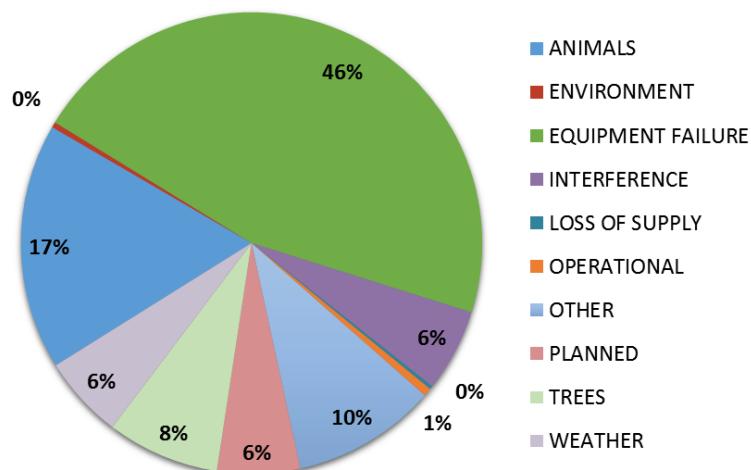
**Washington 2017 Cause Analysis - SAIDI**



**Washington 2017 Cause Analysis - SAIFI**

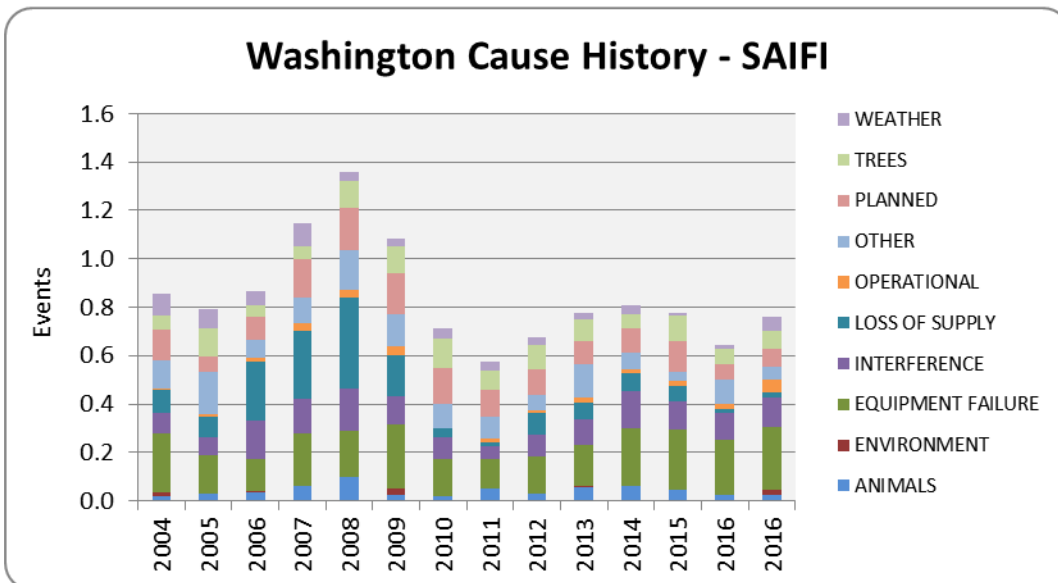
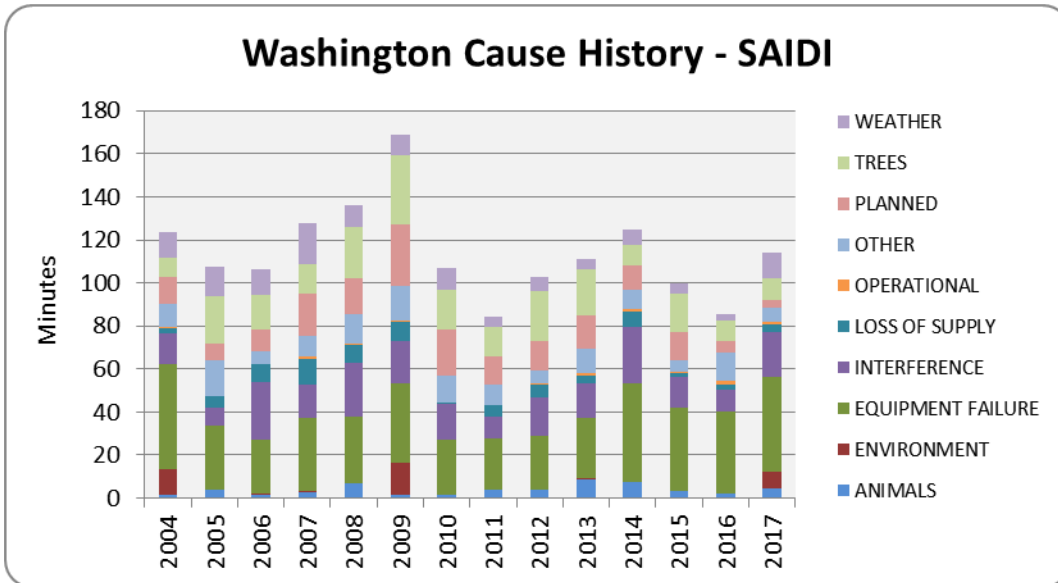


**Washington 2017 Cause Analysis - Incidents**



Direct Cause Category	Category Definition & Example/Direct Cause
<b>Animals</b>	Any problem nest that requires removal, relocation, trimming, etc.; any birds, squirrels or other animals, whether or not remains found.
	<ul style="list-style-type: none"> <li>• Animal (Animals)</li> <li>• Bird Mortality (Non-protected species)</li> <li>• Bird Mortality (Protected species)(BMTS)</li> <li>• Bird Nest</li> <li>• Bird or Nest</li> <li>• Bird Suspected, No Mortality</li> </ul>
<b>Environment</b>	Contamination or Airborne Deposit (i.e. salt, trona ash, other chemical dust, sawdust, etc.); corrosive environment; flooding due to rivers, broken water main, etc.; fire/smoke related to forest, brush or building fires (not including fires due to faults or lightning).
	<ul style="list-style-type: none"> <li>• Condensation/Moisture</li> <li>• Contamination</li> <li>• Fire/Smoke (not due to faults)</li> <li>• Flooding</li> <li>• Major Storm or Disaster</li> <li>• Nearby Fault</li> <li>• Pole Fire</li> </ul>
<b>Equipment Failure</b>	Structural deterioration due to age (incl. pole rot); electrical load above limits; failure for no apparent reason; conditions resulting in a pole/cross arm fire due to reduced insulation qualities; equipment affected by fault on nearby equipment (e.g., broken conductor hits another line).
	<ul style="list-style-type: none"> <li>• B/O Equipment</li> <li>• Overload</li> <li>• Deterioration or Rotting</li> <li>• Substation, Relays</li> </ul>
<b>Interference</b>	Willful damage, interference or theft; such as gun shots, rock throwing, etc.; customer, contractor or other utility dig-in; contact by outside utility, contractor or other third-party individual; vehicle accident, including car, truck, tractor, aircraft, manned balloon; other interfering object such as straw, shoes, string, balloon.
	<ul style="list-style-type: none"> <li>• Dig-in (Non-PacifiCorp Personnel)</li> <li>• Other Interfering Object</li> <li>• Vandalism or Theft</li> <li>• Other Utility/Contractor</li> <li>• Vehicle Accident</li> </ul>
<b>Loss of Supply</b>	Failure of supply from Generator or Transmission system; failure of distribution substation equipment.
	<ul style="list-style-type: none"> <li>• Failure on other line or station</li> <li>• Loss of Feed from Supplier</li> <li>• Loss of Generator</li> <li>• Loss of Substation</li> <li>• Loss of Transmission Line</li> <li>• System Protection</li> </ul>
<b>Operational</b>	Accidental Contact by PacifiCorp or PacifiCorp's Contractors (including live-line work); switching error; testing or commissioning error; relay setting error, including wrong fuse size, equipment by-passed; incorrect circuit records or identification; faulty installation or construction; operational or safety restriction.
	<ul style="list-style-type: none"> <li>• Contact by PacifiCorp</li> <li>• Faulty Install</li> <li>• Improper Protective Coordination</li> <li>• Incorrect Records</li> <li>• Internal Contractor</li> <li>• Internal Tree Contractor</li> <li>• Switching Error</li> <li>• Testing/Startup Error</li> <li>• Unsafe Situation</li> </ul>
<b>Other</b>	Cause Unknown; use comments field if there are some possible reasons.
	<ul style="list-style-type: none"> <li>• Invalid Code</li> <li>• Other, Known Cause</li> <li>• Unknown</li> </ul>
<b>Planned</b>	Transmission requested, affects distribution sub and distribution circuits; Company outage taken to make repairs after storm damage, car hit pole, etc.; construction work, regardless if notice is given; rolling blackouts.
	<ul style="list-style-type: none"> <li>• Construction</li> <li>• Customer Notice Given</li> <li>• Energy Emergency Interruption</li> <li>• Intentional to Clear Trouble</li> <li>• Emergency Damage Repair</li> <li>• Customer Requested</li> <li>• Planned Notice Exempt</li> <li>• Transmission Requested</li> </ul>
<b>Tree</b>	Growing or falling trees
	<ul style="list-style-type: none"> <li>• Tree-Non-preventable</li> <li>• Tree-Trimable</li> <li>• Tree-Tree felled by Logger</li> </ul>
<b>Weather</b>	Wind (excluding windborne material); snow, sleet or blizzard, ice, freezing fog, frost, lightning.
	<ul style="list-style-type: none"> <li>• Extreme Cold/Heat</li> <li>• Freezing Fog &amp; Frost</li> <li>• Wind</li> <li>• Lightning</li> <li>• Rain</li> <li>• Snow, Sleet, Ice and Blizzard</li> </ul>





### 3.6 Areas of Greatest Concern

As in past reports, the Company has continued to focus on improved system hardening and protection. Through targeted reliability projects protective coordination has been improved by replacing hydraulic reclosers, installing new line reclosers, enhancing the existence of fuses that are able to reduce line and customer exposure to fault events and replacing substation relays. This new equipment has allowed for smaller and more coordinated protective operations to clear fault events. Additionally, the Company has continued reliability-centered hardening activities on circuits whose equipment may be performing in a way indicating a lack of resilience to fault events. Using the Company’s proprietary analytical tools, portions of circuits are identified that warrant additional hardening activity, often comprised of crossarm or cut-out replacement. Along with circuit hardening and protection efforts, the Company reviews to obtain better segmentation of circuits, as well as increasing feeder ties and replacing damaged cable. The Company continues to pilot installation of new technologies which augment its reliability-centered toolset. Three new additions to the toolset include 1) fusesavers, which is a device that is able to operate with a single instantaneous trip to clear a fault prior to faulting permanently; 2) spacer cable, an insulated conductor installed in spacers employing a weak-link design philosophy, such that contact and strikes are not fault creating and 3) manual and remote faulted circuit indicators, which help diagnose the location of circuit’s fault events for faster restoration after an event.

Further, the company continues to grow its ability to use reliability data strategically with the development and implementation of reliability-centered tools. It uses a web-based notification tool that alerts when interrupting devices (such as substation breakers, line reclosers or fuses) have exceeded specific performance thresholds. It then promptly investigates these situations, many of which result in localized improvements, such as can occur when a cable section is replaced or when a slack span is re-sagged. This new capability has delivered substantial improvements to customers. Enhancements to the datasets that drive the web notification enable association between inspection conditions and zones of protection for circuits, which allow for prioritization of specific conditions within protective zones close to the substation breaker. Further it has overhauled its geospatial reliability analysis tool, augmenting its functionality to better distinguish circuit details in light of reliability events, particularly in the area of underground cable fault and replacement history. The use of these tools results in maximum improvement for the efforts expended, improving reliability to customers at the best possible costs. Also, the Company has established a Reliability Forum, which is a venue for identifying reliability-centered “best practices” which it can then advance throughout the organization. The Forum investigates specific outage events, evaluates good practices as well as better approaches, establishes specific action items and deliverables and treats the Forum product as a tool for sharing improved methods across the organization. Finally, the company recognized that construction and improvement activities could result in temporary reliability impacts to customers and has been working with its contractors and is developing processes to mitigate the impacts during the construction process.

The table below lists reliability projects identified and currently underway for Washington’s Areas of Greatest Concern; these circuits will be subsequently reported as Program Year 19 circuits in Section 3.7.

Substation	Circuit Name	Circuit	2018 Assessment	Baseline CPI99
PUNKIN CENTER	GRANGER	5Y357	Evaluate impact of circuit re-conductor & reconfiguration; confirm protective coordination settings.	114
NACHES HE PLANT	HAY	5Y131	Evaluate targeted maintenance in primary zones of protection. Review options for brush fire reduction.	191
GRANDVIEW	MABTON EXPR.	5Y174	Review primary zone exposure & install additional fusing.	113
WHITE SWAN	WESLEY	5Y218	Patrol primary zone exposure & install additional fusing as necessary.	135
TOPPENISH	ZILLAH	5Y245	Patrol primary zone exposure & install additional fusing as necessary. Perform hot spot vegetation as necessary.	280

### 3.7 Reduce CPI<sup>1</sup> for Worst Performing Circuits by 20%

On a routine basis, the company reviews circuits for performance. One of the measures that it uses is called circuit performance indicator (CPI), which is a blended weighting of key reliability metrics covering a three-year time frame. The higher the number, the poorer the blended performance the circuit is delivering. As part of the company's Performance Standards Program, it annually selects a set of Worst Performing Circuits for target improvement. The improvements are to be completed within two years of selection. Within five years of selection, the average performance is to be improved by at least 20% (as measured by comparing current performance against baseline performance). Program years 1-12 have previously met improvement targets so are no longer shown in the performance update below.

WASHINGTON WORST PERFORMING CIRCUITS	BASELINE	Performance 12/31/2017
<b>PROGRAM YEAR 18</b>		
Dazet 5Y434	30	12
Green Park 5W116	53	25
Harrah 5Y202	113	27
Orion 5Y577	89	19
Reser Road 5W16	50	45
<b>GOAL MET! TARGET SCORE = 57</b>	<b>67</b>	<b>25</b>
<b>PROGRAM YEAR 17</b>		
GURLEY 5Y358 (circuit split into 5Y850 and 5Y854)	119	4
BOYER 5W118	48	28
FERNDALE 5W106	88	114
NILE 4Y1	301 <sup>2</sup>	253
4 <sup>TH</sup> St. 5Y468	91	112
<b>GOAL MET! TARGET SCORE = 104</b>	<b>129</b>	<b>102</b>
<b>PROGRAM YEAR 16</b>		
DRAPER 5Y156	162	46
PINE STREET (BOWMAN) 5W150	26	40
RUSSEL CREEK 5W121	23	19
TAUMARSON FEEDER 5W50	29	20
VAN BELLE 5Y312	149	54
<b>GOAL MET! TARGET SCORE = 62</b>	<b>78</b>	<b>36</b>
<b>PROGRAM YEAR 15</b>		
MEMORIAL 5W2	60	22
OCCIDENTAL 5Y382	35	25
TAMPICO 5Y380	100	93
10 <sup>TH</sup> STREET 5Y437	77	60
GRAVEL 5Y99	63	41
<b>GOAL MET! TARGET SCORE =54</b>	<b>67</b>	<b>48</b>

<sup>1</sup> The company has historically used CPI05 which includes transmission and major event outages to evaluate the effectiveness of the distribution improvements made. In other states the company serves it has found that the inclusion of these outages may direct resources in a manner not cost-effective, thus it has transitioned to the use of CPI99, which excludes transmission and major event outage impacts into the circuit ratings. The baseline and current performance statistics reflect this transition.

<sup>2</sup> The Bumping River Tap is the targeted area for these improvements; the local performance as measured by the RPI (which is a customer specific metric analogous to the CPI) who baseline performance is 1215. RPI performance during 2017 (using the three-year weighted RPI score) was 1310. Previous performance scores as measured RPI were 1782 (through 2013), 1582 (through 2014), 1215 (through 2015) and 1222 (through 2016).

WASHINGTON WORST PERFORMING CIRCUITS	BASELINE	Performance 12/31/2017
<b>PROGRAM YEAR 14</b>		
CITY 5W324	46	7
BONNEVIEW 5Y302	111	54
CHESTNUT 5Y458	119	50
SOUTH (WENAS) 5Y600	65	78
COUGAR 5Y658	113	26
<b>GOAL MET! TARGET SCORE =73</b>	<b>91</b>	<b>43</b>
<b>PROGRAM YEAR 13</b>		
DONALD 5Y330	57	51
FORNEY 5Y94	172	50
PRESCOTT 5W305	57	48
STEIN 5Y164	148	85
TERRACE HTS 5Y10	99	25
<b>GOAL MET! TARGET SCORE =85</b>	<b>107</b>	<b>52</b>

### 3.8 Restore Service to 85% of Customers within 3 Hours

The Company targets restoring power to 85% of its customers within 3 hours.

WASHINGTON RESTORATIONS WITHIN 3 HOURS					
January – December 2017 = 84%					
January	February	March	April	May	June
90%	80%	97%	87%	86%	64%
July	August	September	October	November	December
87%	54%	74%	92%	93%	88%

### 3.9 Telephone Service and Response to Commission Complaints

COMMITMENT	GOAL	PERFORMANCE
PS5-Answer calls within 30 seconds	80%	81%
PS6a) Respond to commission complaints within 3 days <sup>1</sup>	95%	100%
PS6b) Respond to commission complaints regarding service disconnects within 4 hours	95%	100%
PS6c) Resolve commission complaints within 30 days	95%	100%

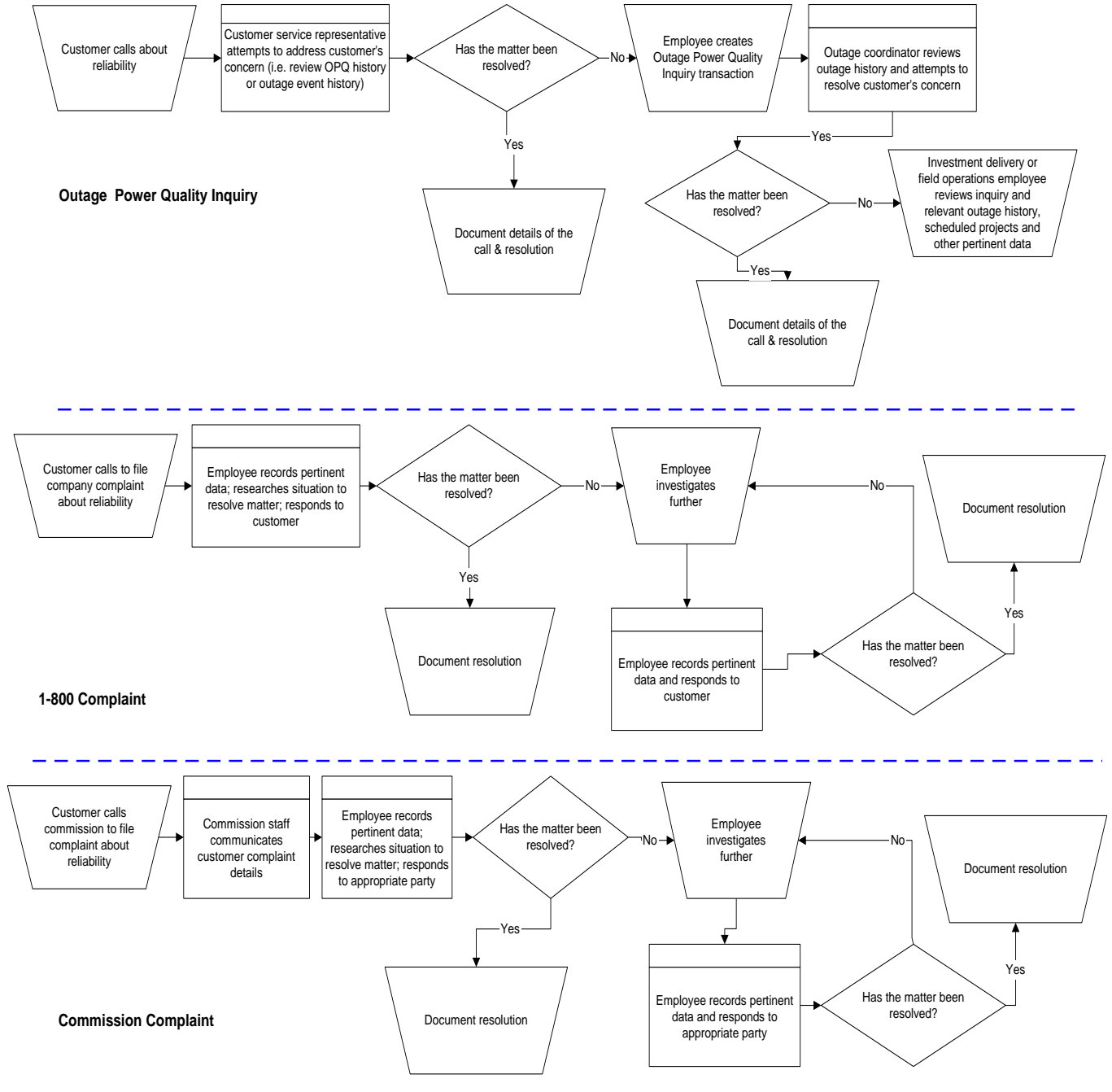
<sup>1</sup> Although the Performance Standard indicates that complaints will be responded to within 3 days, the Company acknowledges and adheres to the requirements set forth in 480-100-173(3)(a).

## 4 CUSTOMER RELIABILITY COMMUNICATIONS

### 4.1 Reliability Complaint Process Overview

The Company’s process for managing customers’ concerns about reliability are to provide opportunities to hear customer concerns, respond to those concerns, and where necessary, provide customers an opportunity to elevate those concerns.

#### Customer Reliability Communications



## 4.2 Customer Complaint Tracking

Listed below are the various avenues available to a customer to resolve concerns about reliability performance.

- **Customer Reliability Inquiry**

The company records customer inquiries about reliability as Outage Power Quality transactions in its customer service system, referred to as “OPQ” transactions.

- **Customer Complaint**

If a customer’s reliability concerns are not met through the process associated with the OPQ transaction, a customer can register a 1-800 complaint with the company. This is recorded in a complaint repository from which regular reports are prepared and circulated for resolution.

- **Commission Complaint**

If a customer’s reliability concerns are not met through the process associated with a 1-800 complaint, a customer can register a complaint with the Commission. This is recorded by the Commission staff and also by the company in a complaint repository. Regular reports are prepared and circulated for resolution of these items.

## 4.3 Customer Complaints Recorded During the Period

Listed below, by the recording source, are reliability-related customer complaints received during the reporting period. If the reliability concern is related to a major event such information is included in the summary.

- **Informal Complaints (1-800 Customer Advocacy Team)**

There were no Informal Complaints received by the company in the reporting period.

- **Commission Complaints**

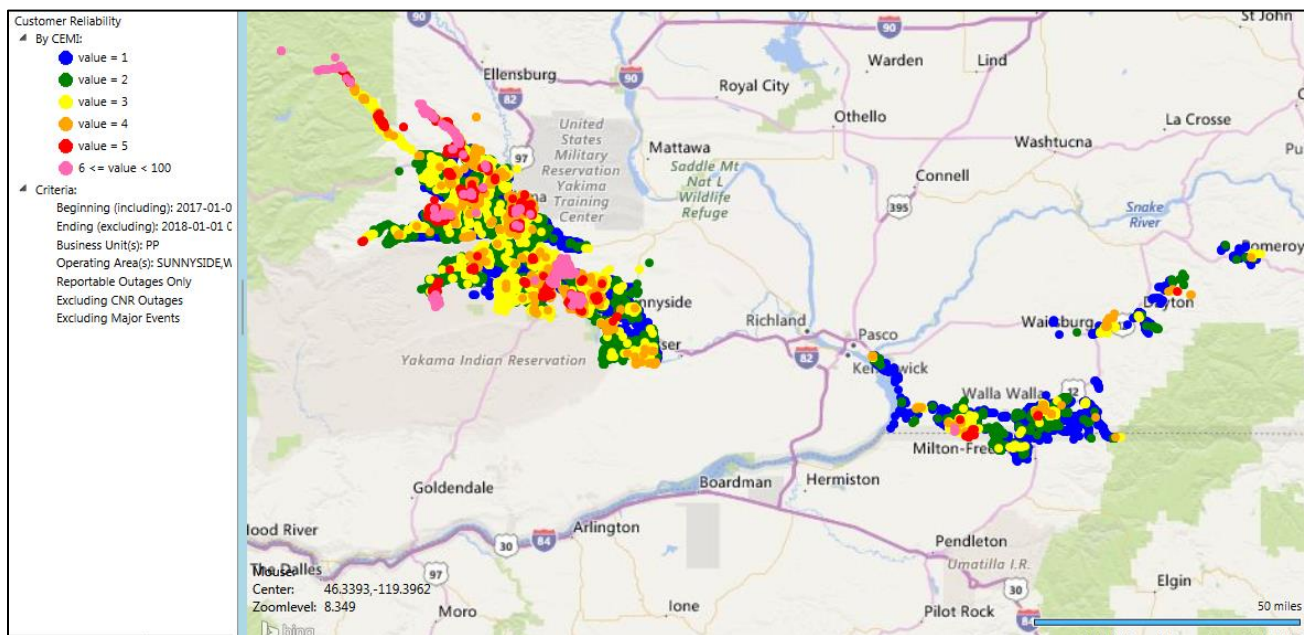
There was one Commission Complaints in the reporting period.

Received	Complaint Type	Site Address	Site ID	Sub- Complaint type	Summary	
8/2/2017	Reliability and Restoration	371 Canyon Road	846387877	Momentary Outages	Frequent momentary outages/power surges to home	Pacific Power had already begun evaluating measures to improve service reliability to the customer. As a result the company set a volt recording meter, and a service upgrade was warranted based upon results. On 1/16/2018 transformer upgrade and new higher capacity service was completed.

## 5 WASHINGTON RELIABILITY RESULTS DURING 2017

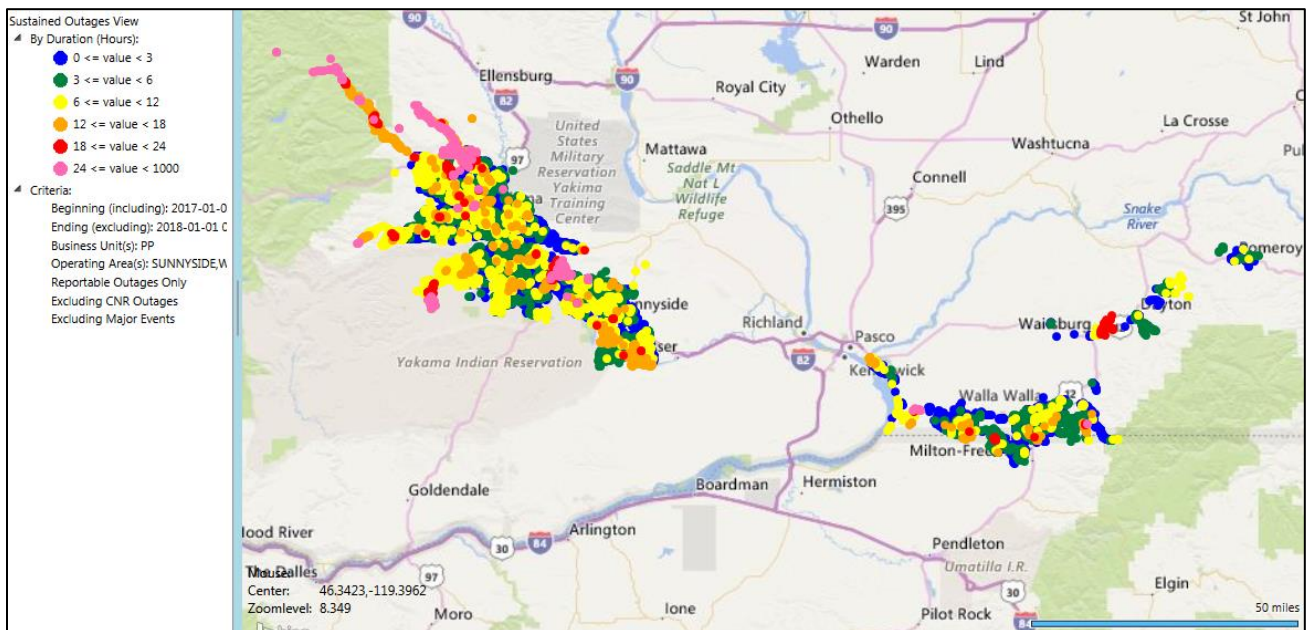
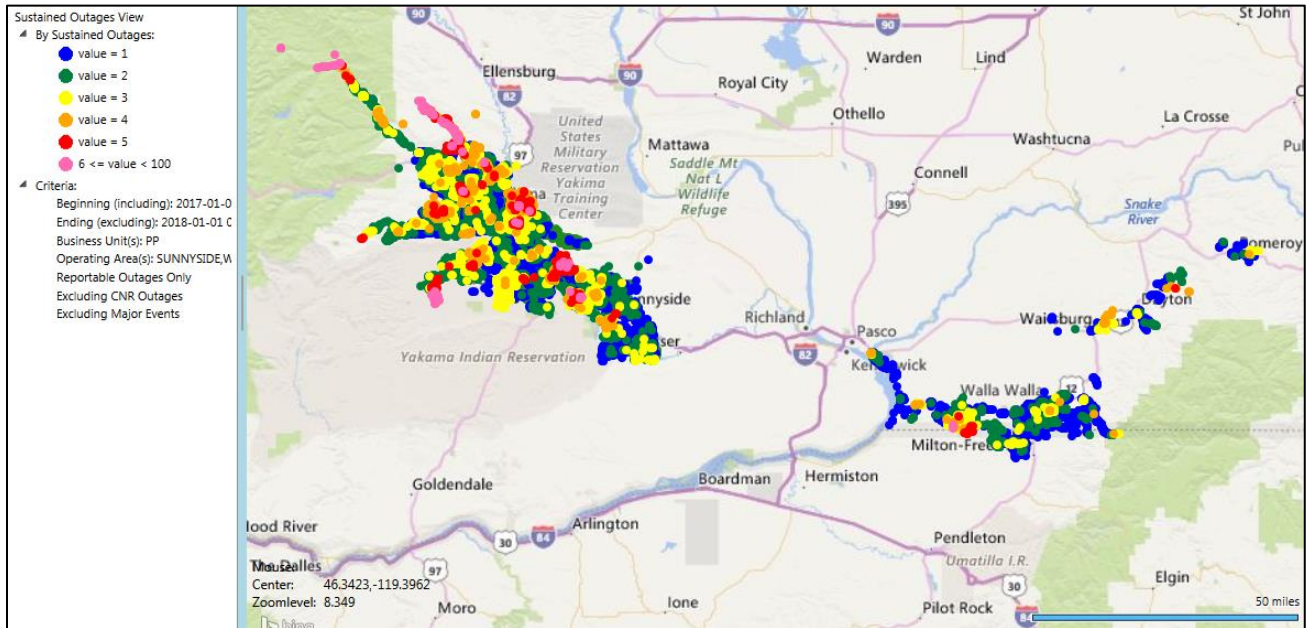
To geospatially display reliability results the Company has developed its GREATER tool which blends circuit topology with outage history and uses a variety of industry metrics (differentiated by color) to indicate areas where reliability analysis should be targeted. In the subsequent plots, two important reliability indicators are depicted. In each plot thumbnails are used to orient the graphic. First, plots with customers experiencing multiple interruptions (CEMI) are shown. This measure shows how many sustained and momentary outages a given service transformer has experienced. The greater the color intensity, with red as the most severe, the more interruptions the transformer has had. Note that this depiction exceeds the requirements of the reporting rule, but is helpful to the Company in selecting areas of reliability concern. Second sustained interruptions are shown. This measure shows how many sustained outages a service transformer has experienced, which is aligned with the requirements of the reporting rules. Third, service transformer-level SAIDI is shown. While technically SAIDI is a “system-level” metric, the local application of this metric can be revealing in determining service transformers that have had long cumulative durations of outages during the period. As explained previously, the greater the color intensity, the longer the outage duration during the period. (Major events, customer requested and prearranged outages are excluded from underlying results.)

### 5.1 State Reliability



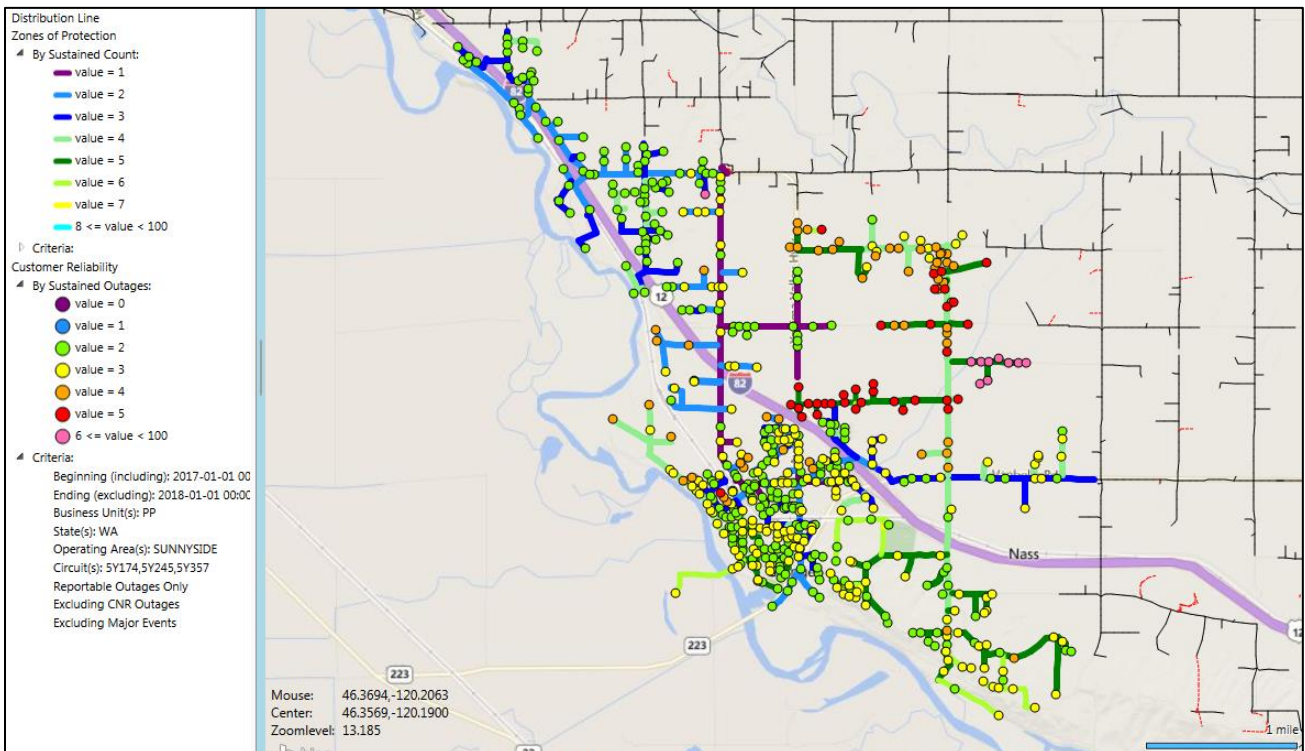
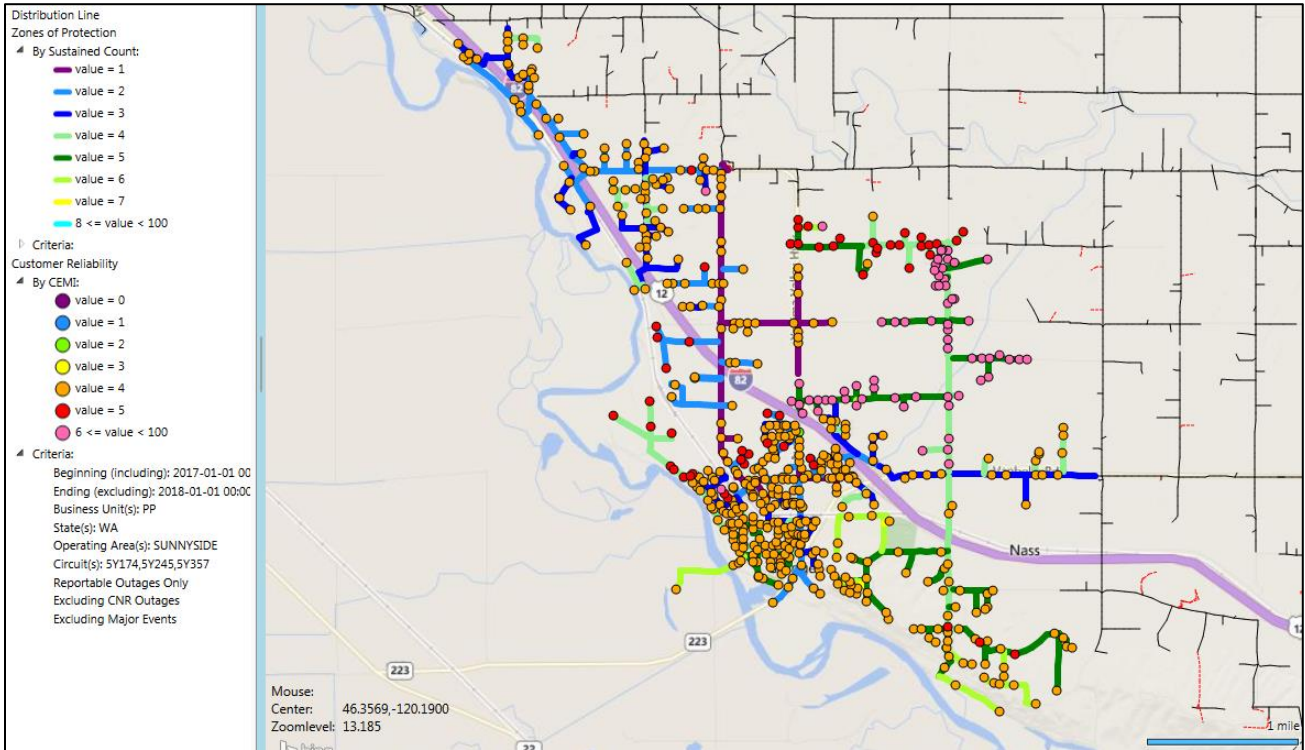


January – December 2017

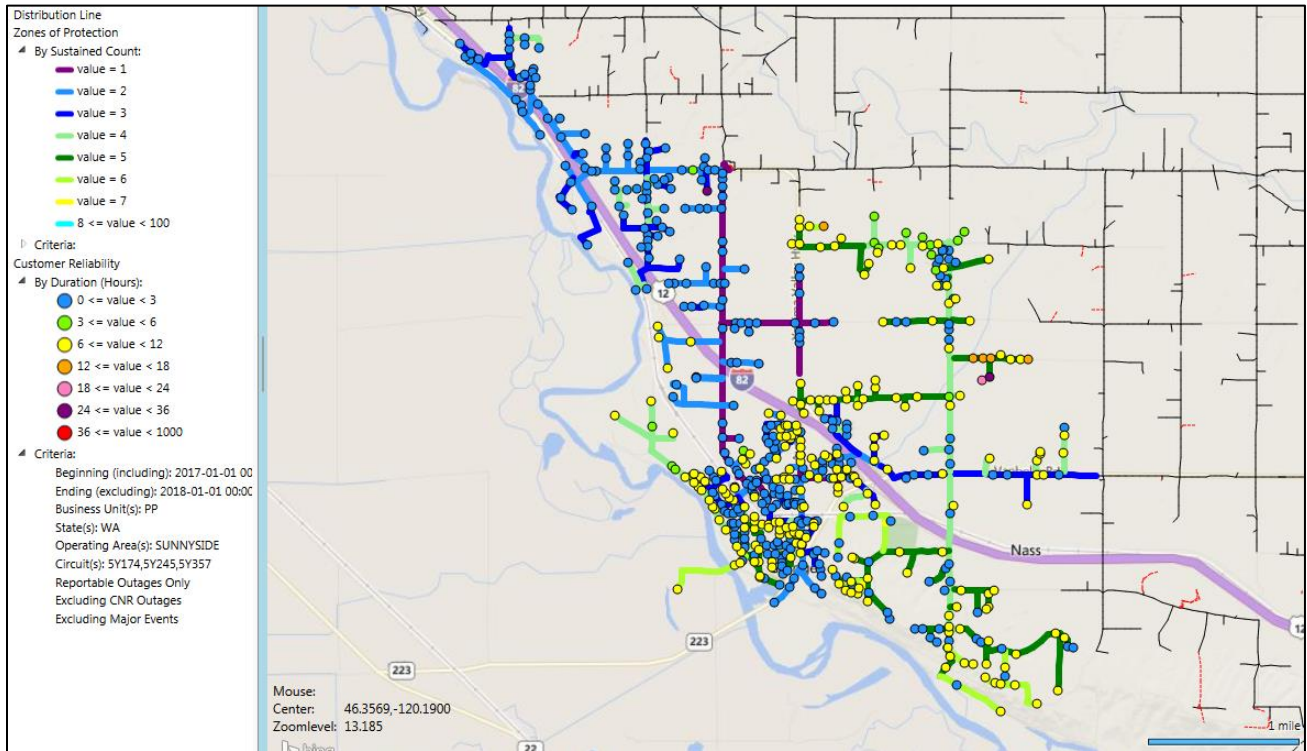




## 5.2 5Y357: Granger

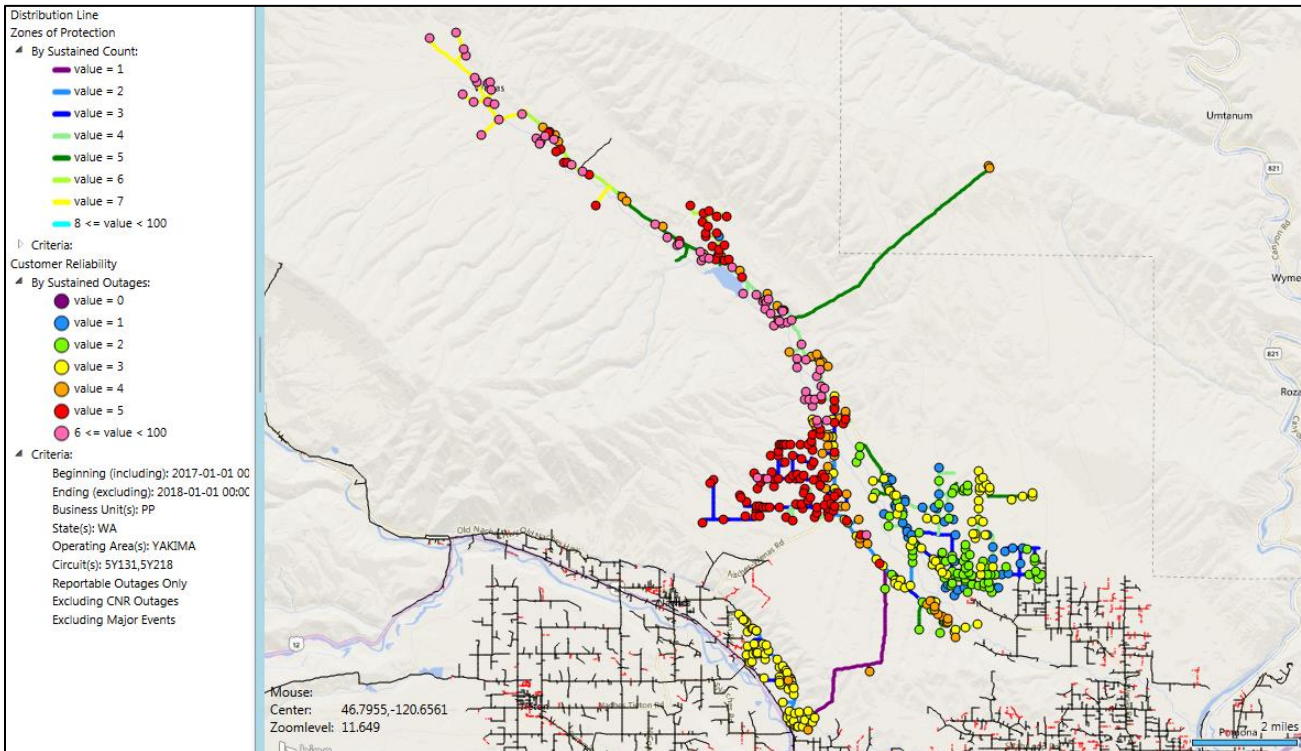
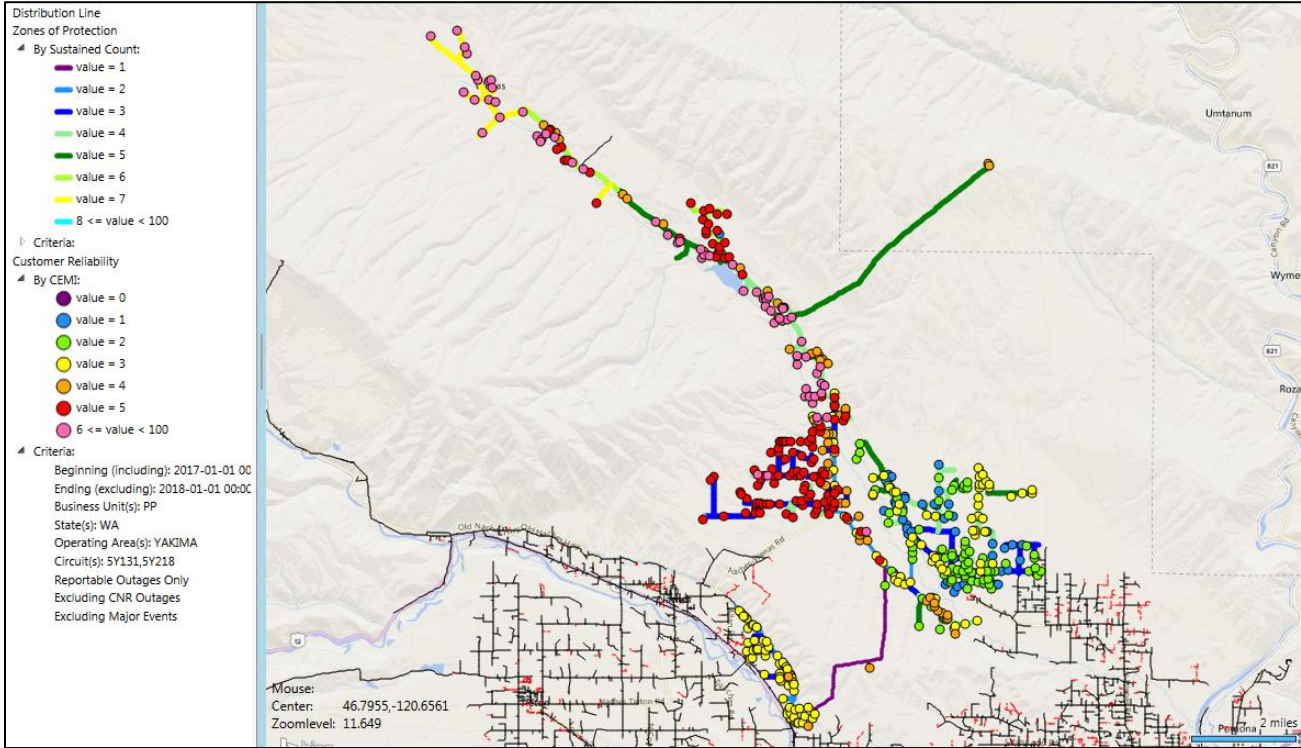


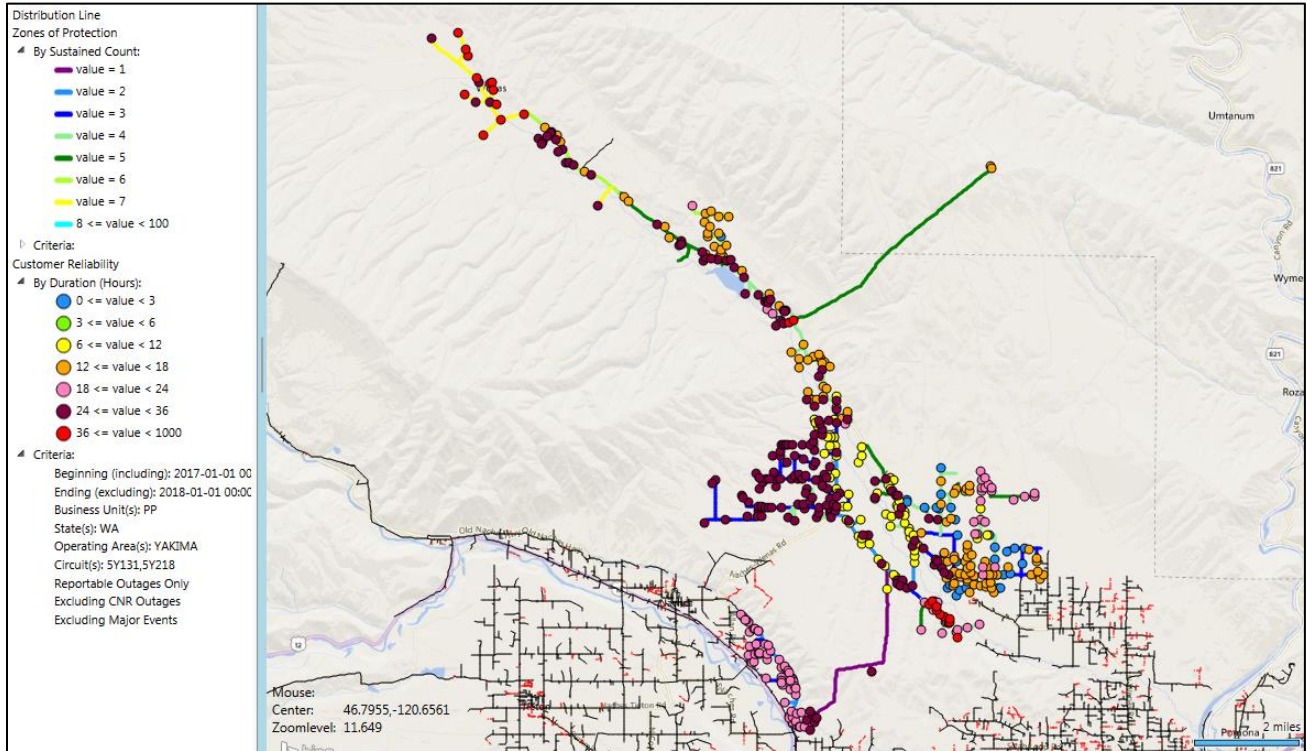
January – December 2017





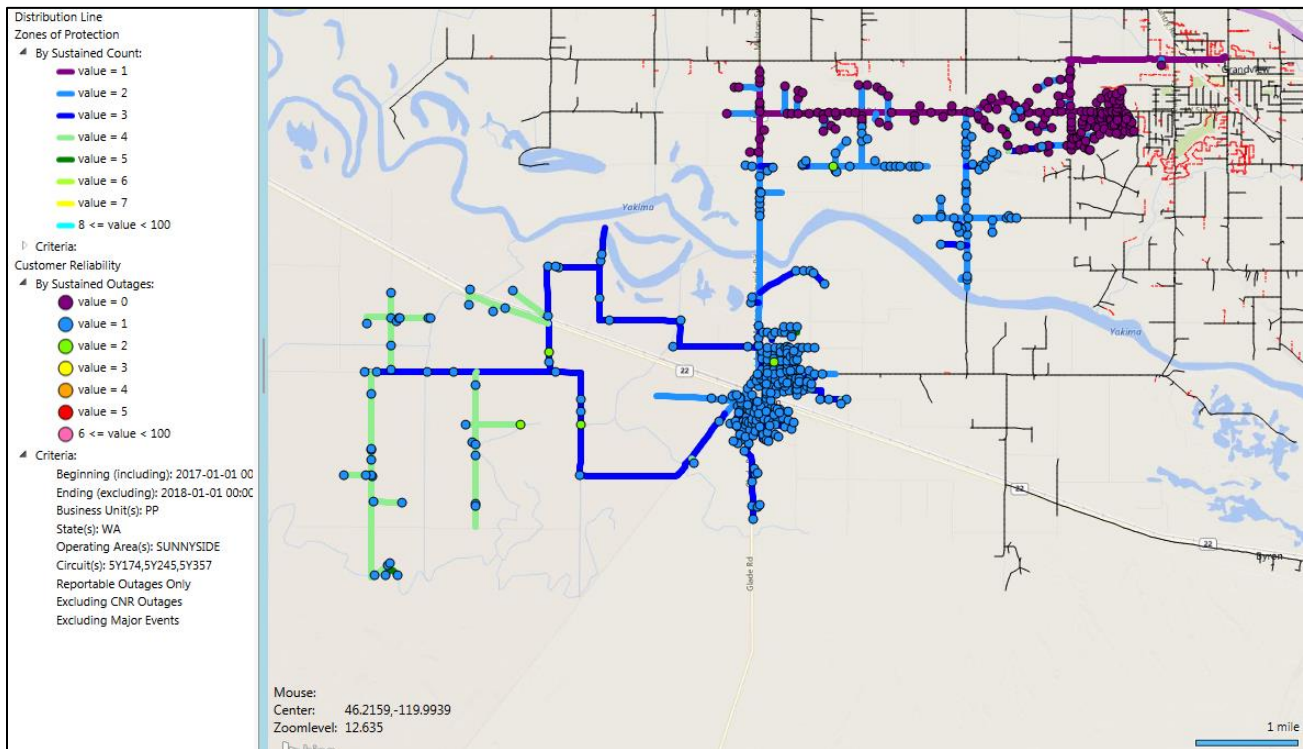
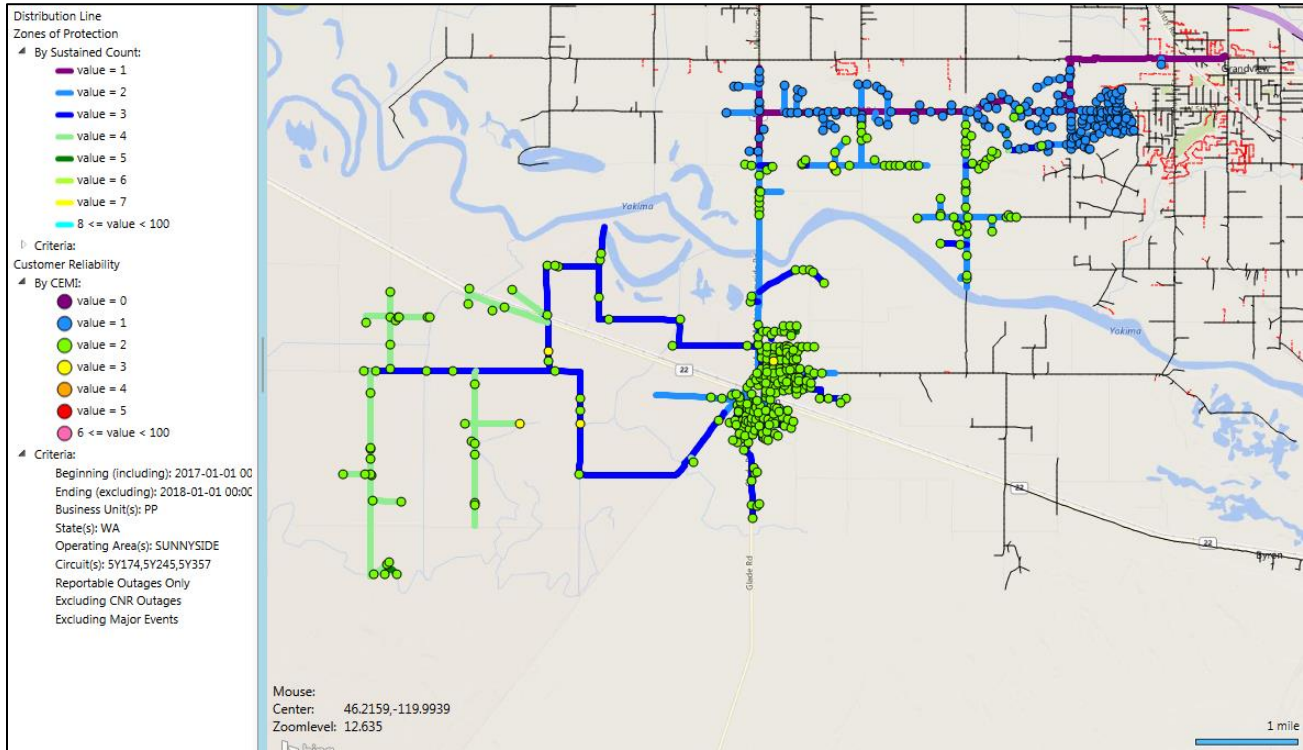
### 5.3 5Y131: Hay



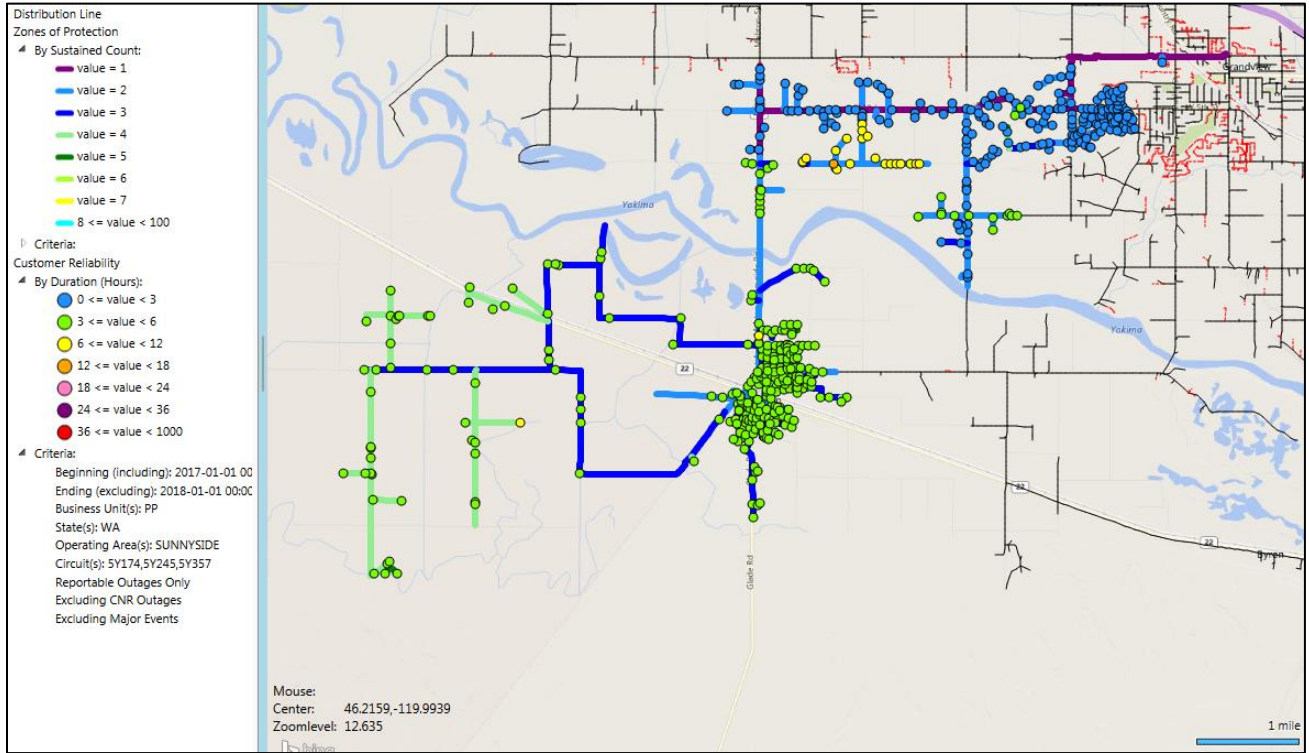




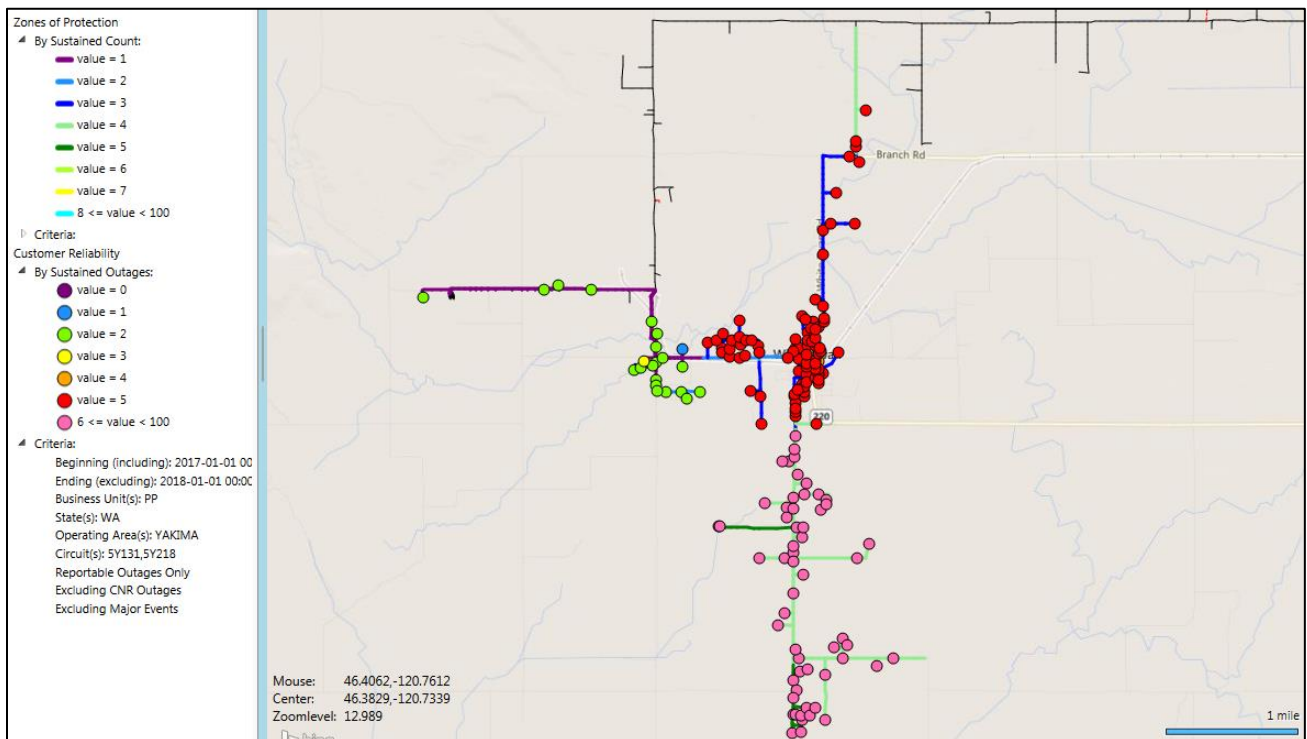
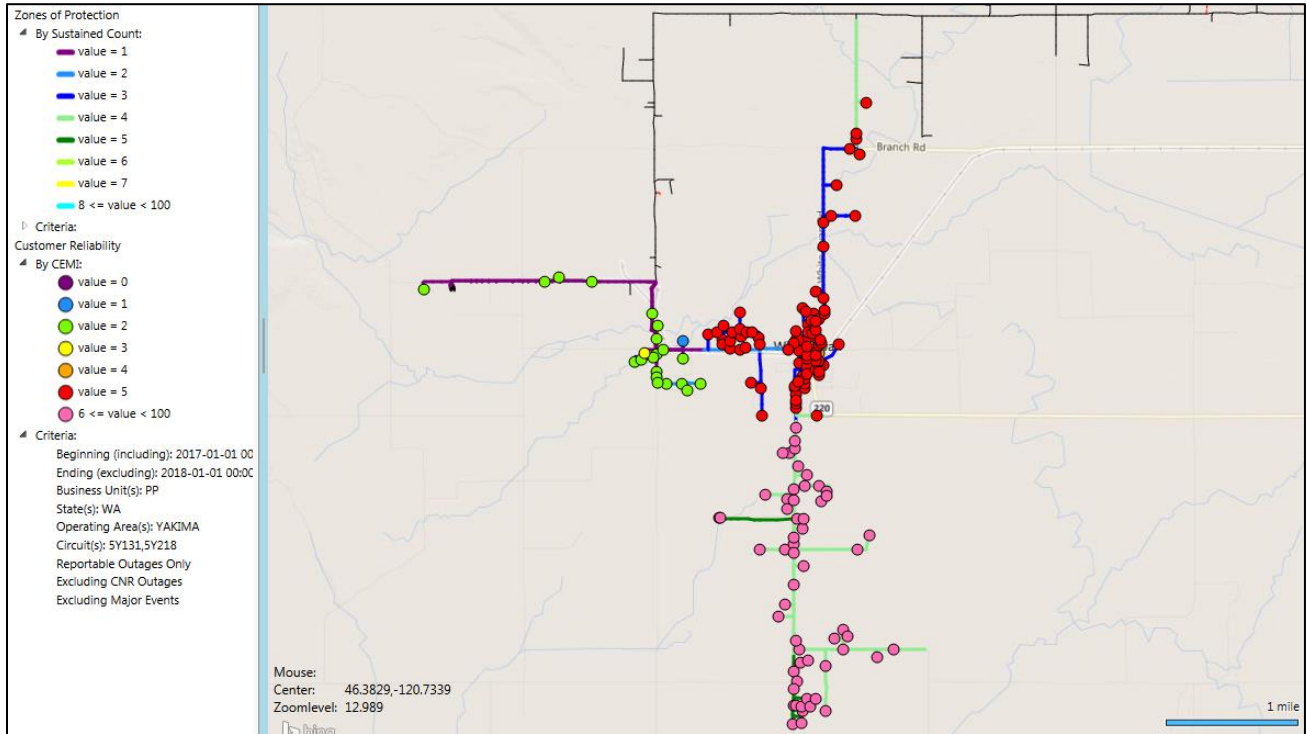
### 5.4 5Y174: Mabton Expr.

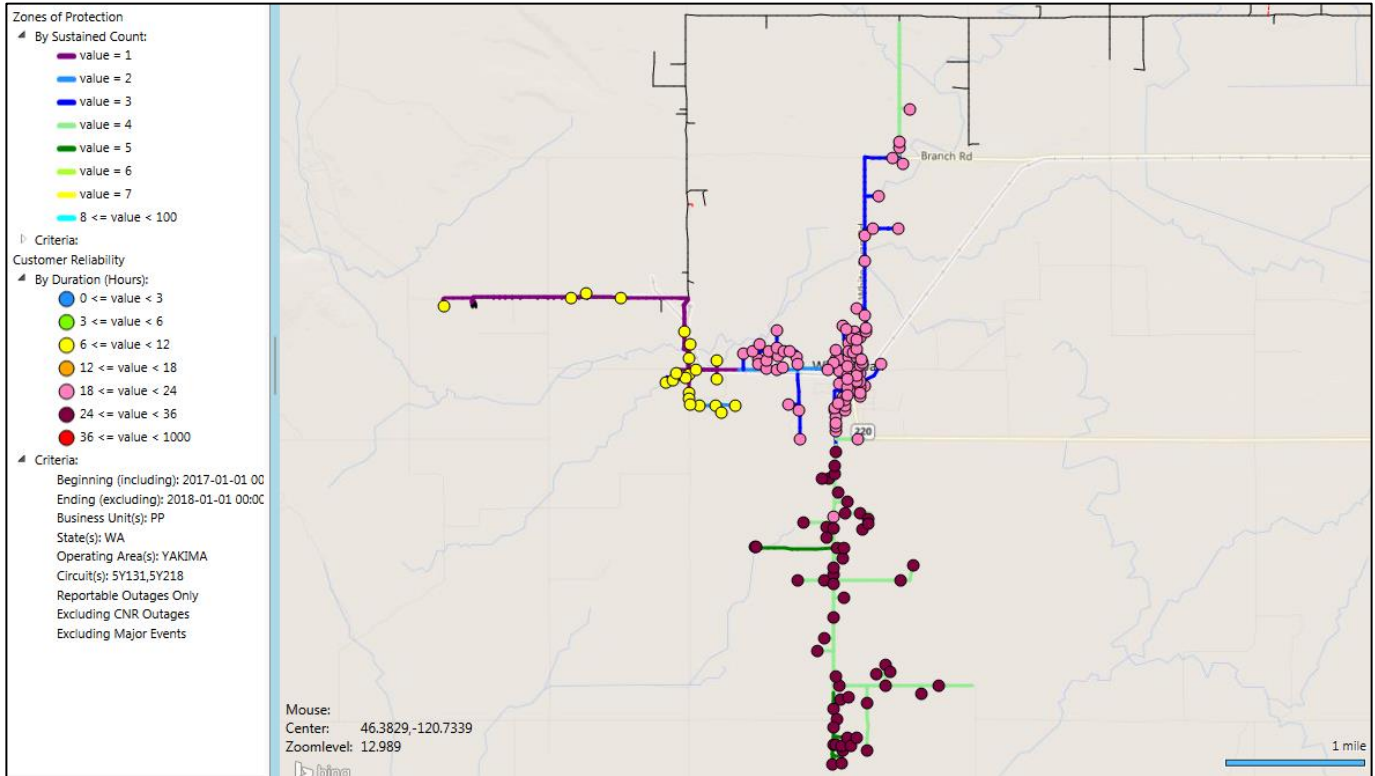


January – December 2017



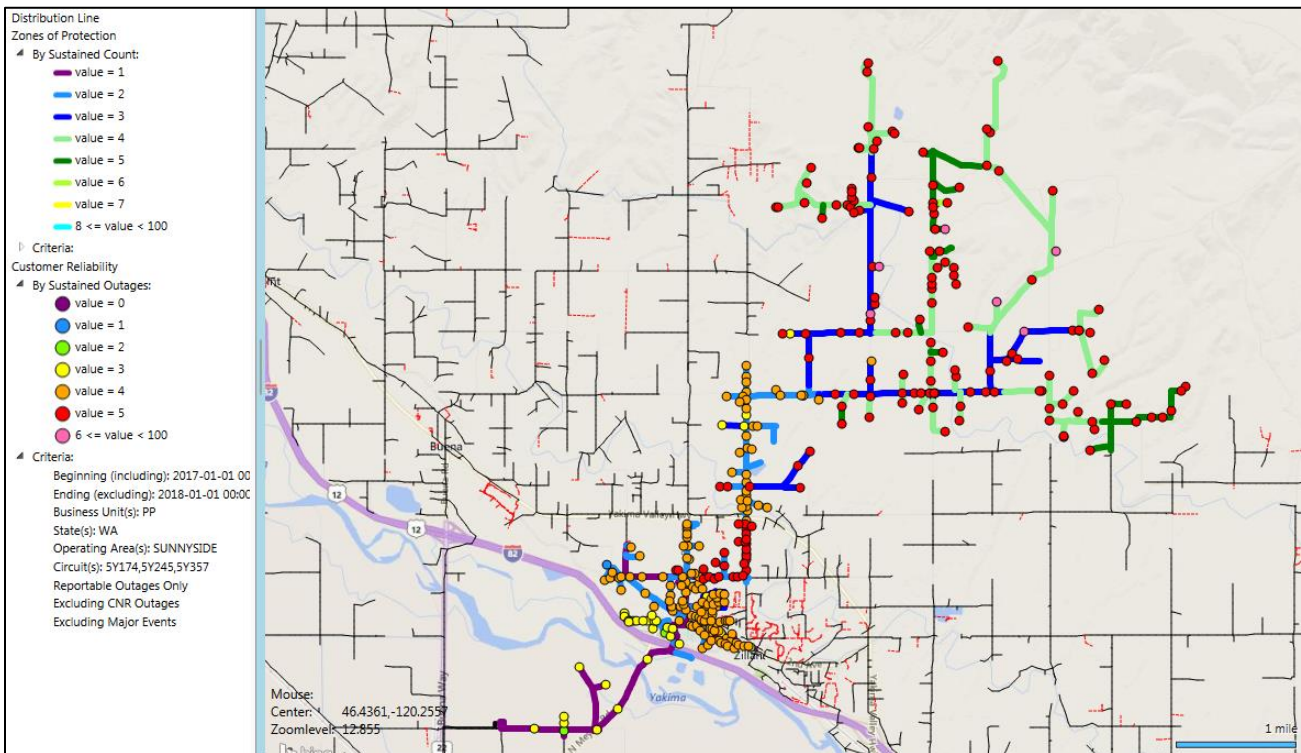
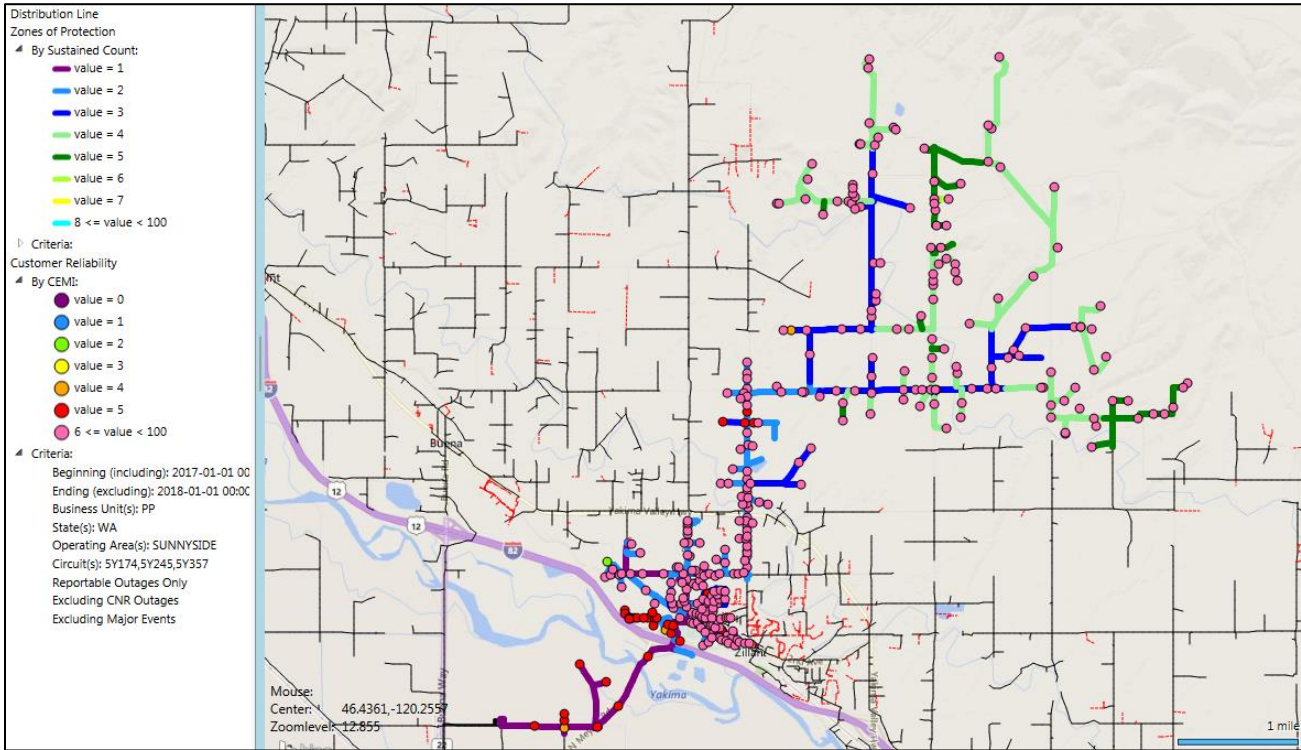
### 5.5 5Y218: Wesley

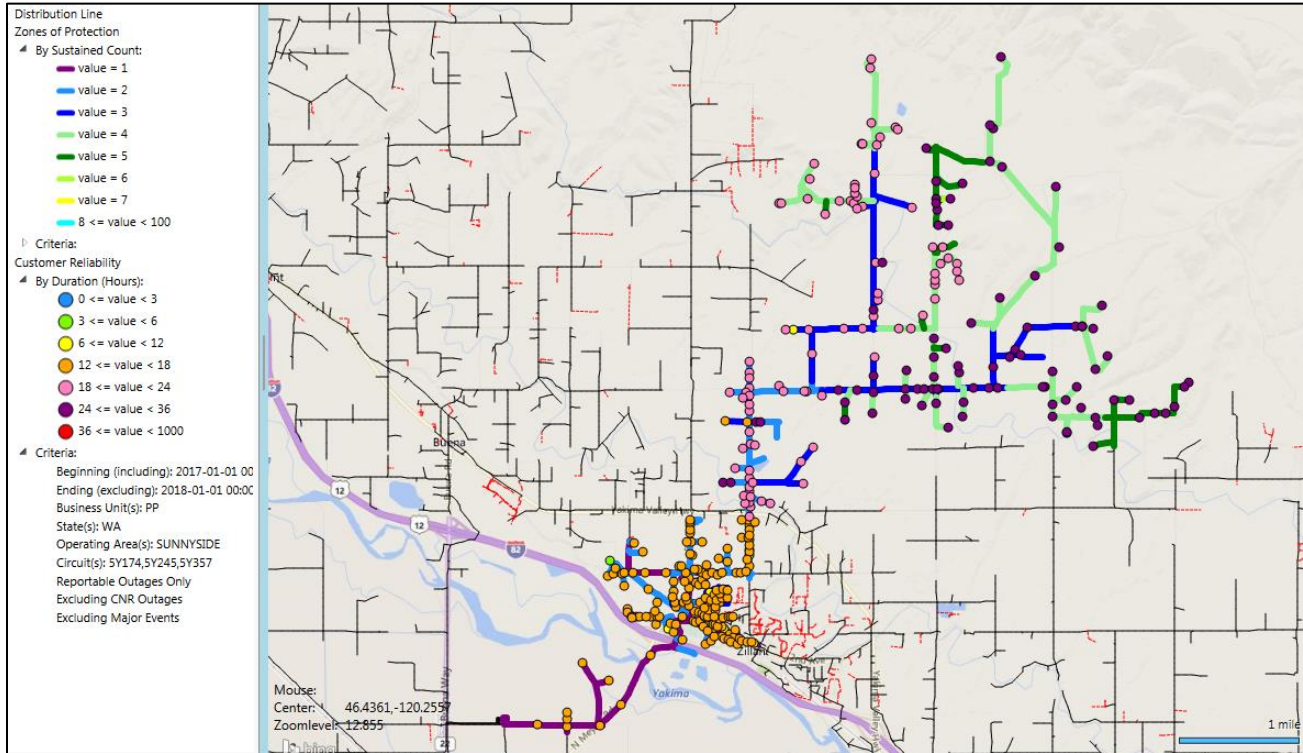






### 5.6 5Y245: Zillah





## APPENDIX A: Reliability Definitions

This section will define the various terms<sup>1</sup> used when referring to interruption types, performance metrics and the internal measures developed to meet performance plans. A map of Pacific Power's service territory is included.

### Interruption Types

#### ***Sustained Outage***

A sustained outage is defined as an outage of equal to or greater than 5 minutes in duration.

#### ***Momentary Outage***

A momentary outage event is defined as an outage equal to or less than 5 minutes in duration, and comprises all operations of the device during the momentary duration; if a breaker goes to lockout (it is unable to clear the faulted condition after the equipment's prescribed number of operations) the momentary operations are part of the ensuing sustained interruption. This sequence of events typically occurs when the system is trying to re-establish energy flow after a faulted condition, and is associated with circuit breakers or other automatic reclosing devices. Pacific Power uses the locations where SCADA (Supervisory Control and Data Acquisition) exists and calculates consistent with IEEE 1366-2003/2012. Where no substation breaker SCADA exists fault counts at substation breakers are to be used.

### Reliability Indices

#### ***SAIDI***

SAIDI (system average interruption duration index) is an industry-defined term to define the average duration summed for all sustained outages a customer experiences in a given period. It is calculated by summing all customer minutes lost for sustained outages (those exceeding 5 minutes) and dividing by all customers served within the study area. When not explicitly stated otherwise, this value can be assumed to be for a one-year period.

#### ***Daily SAIDI***

In order to evaluate trends during a year and to establish Major Event Thresholds, a daily SAIDI value is often used as a measure. This concept was introduced in IEEE Standard P1366-2003/2012. This is the day's total customer minutes out of service divided by the static customer count for the year. It is the total average outage duration customers experienced for that given day. When these daily values are accumulated through the year, it yields the year's SAIDI results.

#### ***SAIFI***

SAIFI (system average interruption frequency index) is an industry-defined term that attempts to identify the frequency of all sustained outages that the average customer experiences during a given period. It is calculated by summing all customer interruptions for sustained outages (those exceeding 5 minutes in duration) and dividing by all customers served within the study area.

#### ***CAIDI***

CAIDI (customer average interruption duration index) is an industry-defined term that is the result of dividing the duration of the average customer's sustained outages by the frequency of outages for that average customer. While the Company did not originally specify this metric under the umbrella of the Performance Standards Program within the context of the Service Standards Commitments, it has since been determined to be valuable for reporting purposes. It is derived by dividing SAIDI by SAIFI.

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<sup>1</sup> IEEE1366-2003/2012 was first adopted by the IEEE Commissioners on December 23, 2003. The definitions and methodology detailed therein are now industry standards, which have since been affirmed in recent balloting activities.

***CEMI***

CEMI is an acronym for Customers Experiencing Multiple (Sustained and Momentary) Interruptions. This index depicts repetition of outages across the period being reported and can be an indicator of recent portions of the system that have experienced reliability challenges. This metric is used to evaluate customer-specific reliability in Section 4 Customer Reliability Communications.

***MAIFI<sub>E</sub>***

MAIFI<sub>E</sub> (momentary average interruption event frequency index) is an industry standard index that quantifies the frequency of all momentary interruption events that the average customer experiences during a given time-frame. It is calculated by counting all momentary interruptions which occur within a 5 minute time period, as long as the interruption event did not result in a device experiencing a sustained interruption.

***CPI99***

CPI99 is an acronym for Circuit Performance Indicator, which uses key reliability metrics of the circuit to identify underperforming circuits. It excludes Major Event and Loss of Supply or Transmission outages. The variables and equation for calculating CPI are:

$$\text{CPI} = \text{Index} * ((\text{SAIDI} * \text{WF} * \text{NF}) + (\text{SAIFI} * \text{WF} * \text{NF}) + (\text{MAIFI} * \text{WF} * \text{NF}) + (\text{Lockouts} * \text{WF} * \text{NF}))$$

Index: 10.645

SAIDI: Weighting Factor 0.30, Normalizing Factor 0.029

SAIFI: Weighting Factor 0.30, Normalizing Factor 2.439

MAIFI: Weighting Factor 0.20, Normalizing Factor 0.70

Lockouts: Weighting Factor 0.20, Normalizing Factor 2.00

Therefore,  $10.645 * ((3\text{-year SAIDI} * 0.30 * 0.029) + (3\text{-year SAIFI} * 0.30 * 2.439) + (3\text{-year MAIFI} * 0.20 * 0.70) + (3\text{-year breaker lockouts} * 0.20 * 2.00)) = \text{CPI Score}$

***CPI05***

CPI05 is an acronym for Circuit Performance Indicator, which uses key reliability metrics of the circuit to identify underperforming circuits. Unlike CPI99 it includes Major Event and Loss of Supply or Transmission outages. The calculation of CPI05 uses the same weighting and normalizing factors as CPI99.

**Performance Types & Commitments**

Pacific Power recognizes two categories of performance: underlying performance and major events. Major events represent the atypical, with extraordinary numbers and durations for outages beyond the usual. Ordinary outages are incorporated within underlying performance. These types of events are further defined below.

***Major Events***

Pursuant to WAC 480-100-393 Electric Reliability Annual Monitoring and Reporting Plan, modified February 2011, the company recognizes two types of major events in Washington:

- A SAIDI-based Major Event is defined as a 24-hour period where SAIDI exceeds a statistically derived threshold value, as detailed in IEEE Distribution Reliability Standard 1366-2003/2012.
- A SAIFI-Based Major Event is defined as an event in which more than 10% of an operating area's customers are simultaneously without service as a result of a sustained interruption.



***Underlying Events***

Within the industry, there has been a great need to develop methodologies to evaluate year-on-year performance. This has led to the development of methods for segregating outlier days. Those days which fall below the statistically derived threshold represent “underlying” performance, and are valid (with some minor considerations for changes in reporting practices) for establishing and evaluating meaningful performance trends over time. If any changes have occurred in outage reporting processes, those impacts need to be considered when making comparisons. Underlying events include all sustained interruptions, whether of a controllable or non-controllable cause, exclusive of major events, prearranged (which can include short notice emergency prearranged outages), customer requested interruptions and forced outages mandated by public authority typically regarding safety in an emergency situation.

***Performance Targets***

The Company and Commission, in the MidAmerican transaction docket, UE05-01590, agreed to extend Service Standards through 12/31/2011. Within Washington, because performance delivered by the Company falls within industry second quartile performance levels, the Company committed that it would achieve performance by 12/31/2011 that maintains performance targets set in prior Merger Commitment Periods. Additionally in WAC 480-100-393 the Company is required to set baseline metrics and when performance deviates from those baselines, explain the reasons for that deviation and any action plans which may result from that level of performance.

## APPENDIX B: 2017 Major Event Filings

**Report to the Washington Utilities and Transportation Commission**  
**Electric Service Reliability - Major Event Report**

Event Date:	January 16, 2017
Date Submitted:	March 2, 2017
Primary Affected Locations:	Walla Walla
Primary Cause:	Loss of Transmission
Exclude from Reporting Status:	Yes
Report Prepared by:	April Brewer
Report Approved by:	Heide Caswell / Kevin Putnam / David O'Neil / Pablo Arronte

### Event Description

On January 16, 2017, Walla Walla, Washington, experienced a system average interruption frequency index (SAIFI)-based major event when a damaged lightning arrester inside the Bowman Substation caused the transmission line circuit breaker to open. The outage affected 4,430<sup>1</sup> customers; approximately 16% of the Walla Walla operating area's customers, for 1 hour 41 minutes.

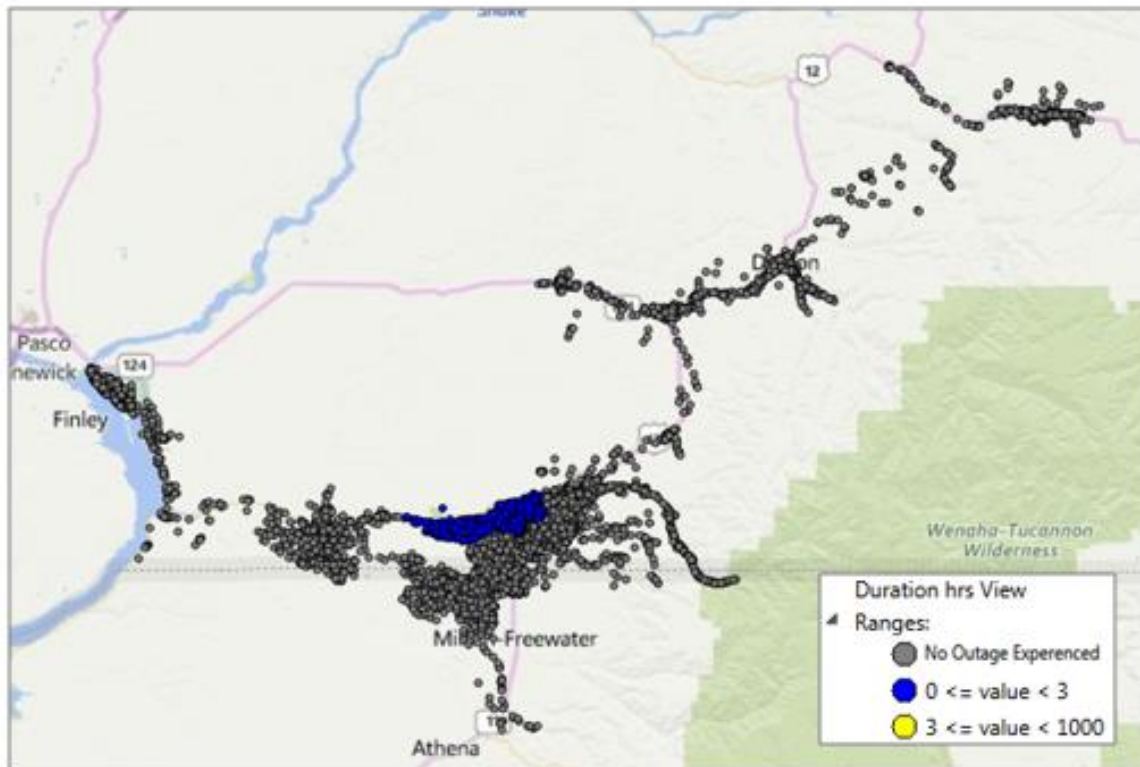
Event Outage Summary	
# Interruptions (sustained)	5
Total Customer Interrupted (sustained)	4,431
Total Customer Minutes Lost	447,318
State Event SAIDI	3.33 Minutes
CAIDI	101
Major Event Start	1/16/17 12:00 AM
Major Event End	1/17/17 12:00 AM

<sup>1</sup> A SAIFI-based major event threshold (as identified in PacifiCorp's reporting plan, pursuant to Washington Administrative Code (WAC) 480-100-393 & 398 Electric Reliability Annual Monitoring and Reporting Plan) is defined as an event in which more than 10% of an operating area's customers are simultaneously without service as a result of a sustained interruption. Walla Walla operating area's Calendar 2017 Frozen Customer Count is 28,387 customers.

### Restoration Summary

At 12:24 pm on January 16, 2017, Walla Walla, Washington, experienced a loss of transmission event when a lightning arrester on a station transformer within the Bowman substation experienced a fault event causing the circuit breaker to trip. Personnel was dispatched to the substation. Meanwhile dispatch began reviewing the system configuration in an effort to create switching orders to restore service to customers as rapidly as possible. Upon arrival at the substation the field personnel were able to isolate the damaged substation transformer high side lightning arrester and reenergize the transmission line and the substation.

There were no company or commission customer complaints made regarding the major event.



### Restoration Intervals

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24+ Hrs.
4,431	4,430	1	0

### Restoration Resources

Personnel Resources	
Journeyman	7
<b>TOTAL</b>	<b>7</b>

### State Estimated Major Event Costs

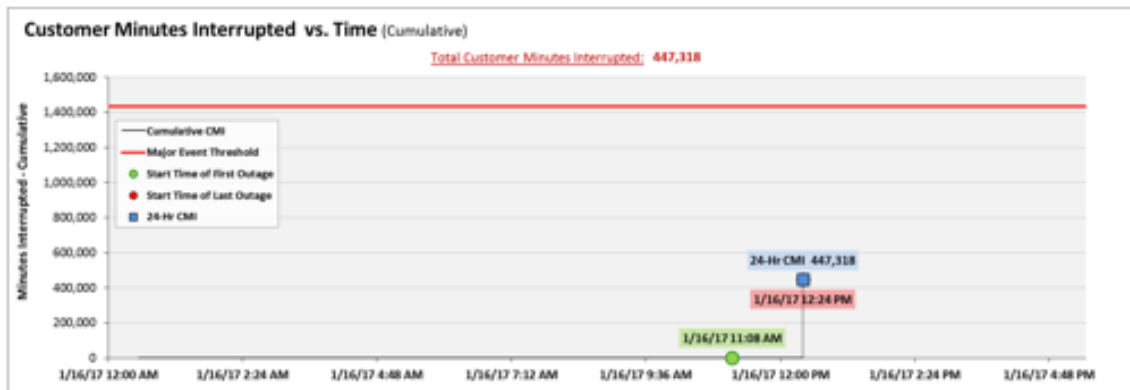
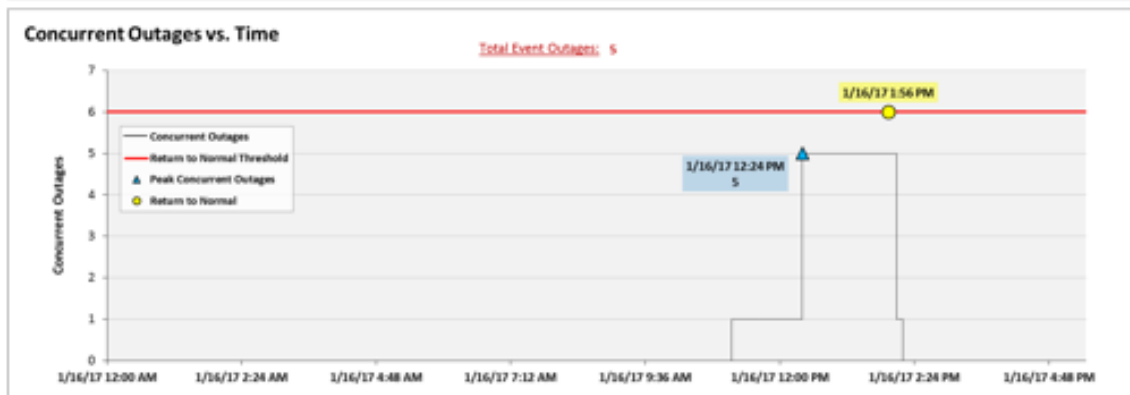
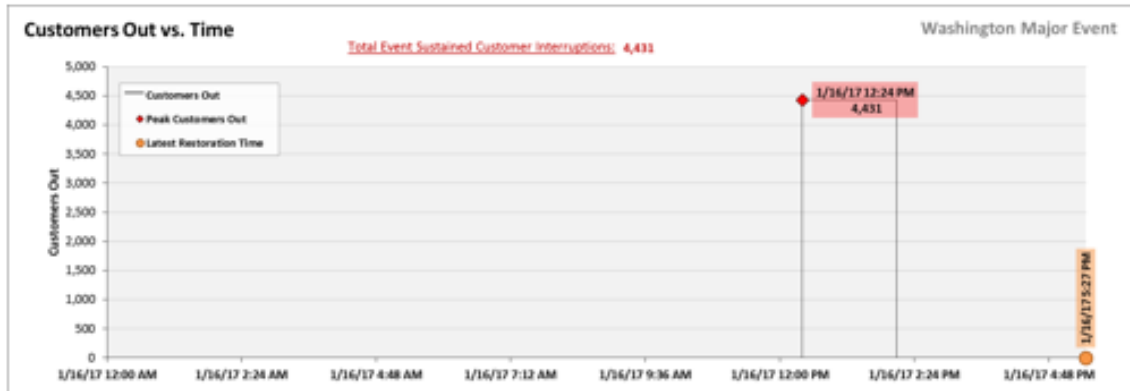
Estimate \$	Labor	Material	Contract Resources +	Total
Capital	\$3,102	\$434	\$0	\$3,536
Expense	\$0	\$0	\$0	\$0
<b>Total</b>	<b>\$3,102</b>	<b>\$434</b>	<b>\$0</b>	<b>\$3,536</b>

### Major Event Declaration

Pacific Power is requesting designation of this event and its consequences to be classified as a "Major Event" for exclusion from underlying network performance reporting. This major event exceeded the company's current Washington system average interruption frequency index-driven (SAIFI) threshold of 10% total operating area customers served sustained interruptions (4,430 customers interrupted out of 28,387 Walla Walla operating area customers, or 16% of the operating area customers) simultaneously in a 24-hour period.



**Event Detail**



**SAIDI, SAIFI, CAIDI by Reliability Reporting Region**

Please see the attached system-generated reports.

**Report to the Washington Utilities and Transportation Commission**  
**Electric Service Reliability - Major Event Report**

Event Date: June 4<sup>th</sup>, 2017

Date Submitted: July 13, 2017

Primary Affected Locations: Sunnyside

Primary Cause: Animal Interference

Exclude from Reporting Status: Yes

Report Prepared by: April Brewer / Mark VanWinkle

Report Approved by: Heide Caswell / Kevin Putnam / David O’Neil / Pablo Arronte

**Event Description**

On the morning of June 4<sup>th</sup>, 2017 at 07:50 am, six circuit feeds from the Sunnyside substation experienced an interruption, when an encroaching squirrel resulted in an electrical fault, which damaged buss work, disconnect switches, and insulators within the substation. The outage event affected 6,458 customers with outage durations ranging from 5 hours 14 minutes to 10 hours. The event affected 26% of the total customers served within the Sunnyside operating area.

<b>Event Outage Summary</b>	
# Interruptions (sustained)	17
Total Customer Interrupted (sustained)	6,458
Total Customer Minutes Lost	3,357,306
Event SAIDI	25.02 Minutes
CAIDI	518
Major Event Start	6/4/17 12:00 AM
Major Event End	6/5/17 12:00 AM

**Restoration Summary**

At 7:50 am on the morning of June 4<sup>th</sup>, 2017, Sunnyside, Washington, experienced a loss of supply event when transformer high side fuses operated at the Sunnyside substation, causing a loss of feed to six distribution circuits, serving 6,458 customers. Crews were quickly dispatched to the area to assess damage and begin restoration activities. Once personnel arrived at the substation it was determined that a squirrel had encroached into the animal-guarded substation, resulting in a fault that damaged 9 main bus insulators, main bus, three disconnect switches, and various animal guarding pieces, with the majority of the damage in the 5Y316 feeder bay.

Crews began working with dispatch and area engineers to develop the appropriate substation switching orders in an effort to begin restoring power to customers concurrent with isolating power feeds to the equipment needing repair. The station transformers were inspected and tested for damage, with satisfactory test results. Feeder 5Y316 bay sustained significant damage and it was identified that repairs would take the longest so field switching efforts were undertaken outside the substation to restore customers from other sources. All customers served by feeder 5Y316 were step restored at 1:04 pm, 1:53 pm, 2:37 pm, 4:26 pm, and 4:40pm.

At 4:17 pm the first of the six circuits was re-energized, restoring power to 1,434 customers. By 4:26 pm three additional circuit feeds were re-energized, restoring power to another 2,645 customers. And at 5:50 pm the last 1,206 customers without power were restored. Once all customers were restored focus shifted to completing repairs to 5Y316 feeder bay and to restore the substation and feeders in the field to a normal configuration. 5Y316 breaker was restored to normal configuration at 11:02 pm, with the remaining restoration actions completed the morning of June 5. There were no company or commission customer complaints made regarding the major event.

### Restoration Intervals<sup>1</sup>

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24+ Hrs.
6,485	8	6,477	0

### Restoration Resources

Personnel Resources	
Collector	2
Journeyman	10
Relay Technician	4
SR Warehouse Worker	1
Materials	
15KV Post Insulators	9
Line Fuses	6
Animal Guarding Material	22

### State Estimated Major Event Costs

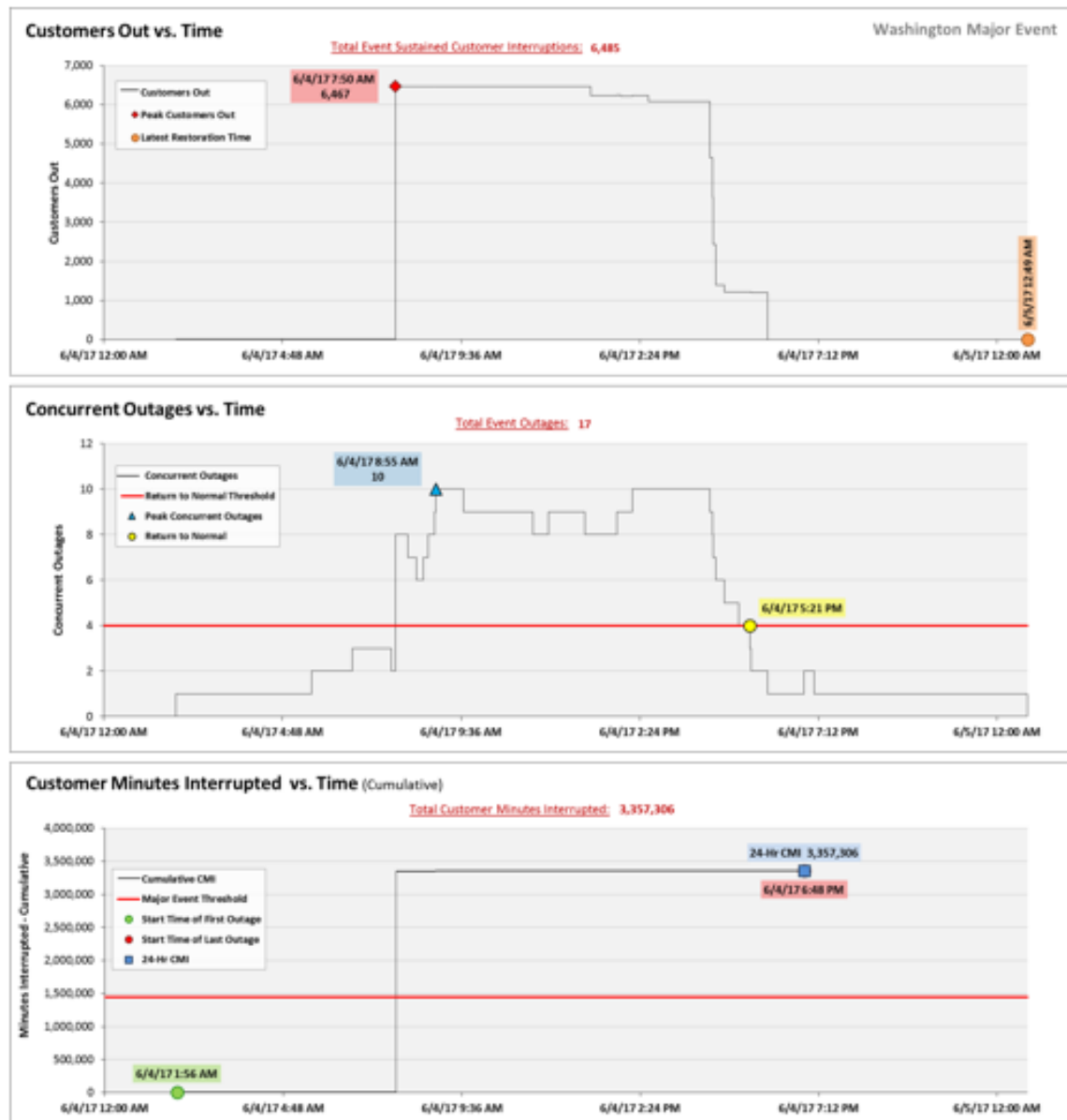
Estimate \$	Labor	Contracts	Materials	Overheads	Total
Capital Expense	\$29,887	\$173	\$20,201	\$3,239	\$50,261
	-	-	-	-	-
<b>Total</b>	<b>\$29,887</b>	<b>\$173</b>	<b>\$20,201</b>	<b>\$3,239</b>	<b>\$50,261</b>

<sup>1</sup> Data provided represents specific system records for personnel, resources, and costs. However additional resources whose participation did not get individually captured in transaction recording systems were utilized during the event, thus the data presented here effectively understates the resources, including cost, involved in restoring the system to normal.

## Major Event Declaration

Pacific Power is requesting designation of this event and its consequences to be classified as a “Major Event” for exclusion from network performance reporting with the IEEE 1366-2003/2012. This major event exceeded the company’s 2017 Washington threshold of 1,444,820 customer minutes lost (10.77 state SAIDI minutes) in a 24-hour period.

## Event Detail



## SAIDI, SAIFI, CAIDI by Reliability Reporting Region

Please see the attached system-generated reports.

**Report to the Washington Utilities and Transportation Commission  
Electric Service Reliability - Major Event Report**

Event Date:	October 21-22, 2017
Date Submitted:	November 30, 2017
Primary Affected Locations:	Yakima
Primary Cause:	Weather
Exclude from Reporting Status:	Yes
Report Prepared by:	April Brewer
Report Approved by:	Heide Caswell / Kevin Putnam / David O’Neil

**Event Description**

On the morning of October 21, 2017, service areas across Washington began experiencing storm-related outages. The combination of the first rain of the season and the build-up of dust and particulate matter caused pole fires. During the two day event pole fires significantly impacted the system, accounting for almost half of all sustained outage events, 87% of all customer minutes lost, and 88% of all customer outages. On October 21, at 9:41 AM the total customers without power peaked at 8,649. In total, the event caused over 15,000 customer outages with durations ranging from 10 minutes to 40 hours and 28 minutes, with an average event outage duration of 2 hours and 34 minutes.

Event Outage Summary	
# Interruptions (sustained)	52
Total Customer Interrupted (sustained)	15,078
Total Customer Minutes Lost	2,321,643
Event SAIDI	17.3 Minutes
CAIDI	154
Major Event Start	10/21/17 7:19 AM
Major Event End	10/23/17 12:00 AM

**Restoration Summary**

On October 21, 2017, areas across the state began experiencing outages as rainfall, which coincided with pollution-laden hardware from the summer months, caused numerous pole fires and damage to equipment.

During the two day event concurrent outages were up six-fold, and given the quantity of simultaneous outages crews from Oregon (internal) and four crews from Washington (external) were brought in to assist with restoration activities. Portland dispatch managed the outages

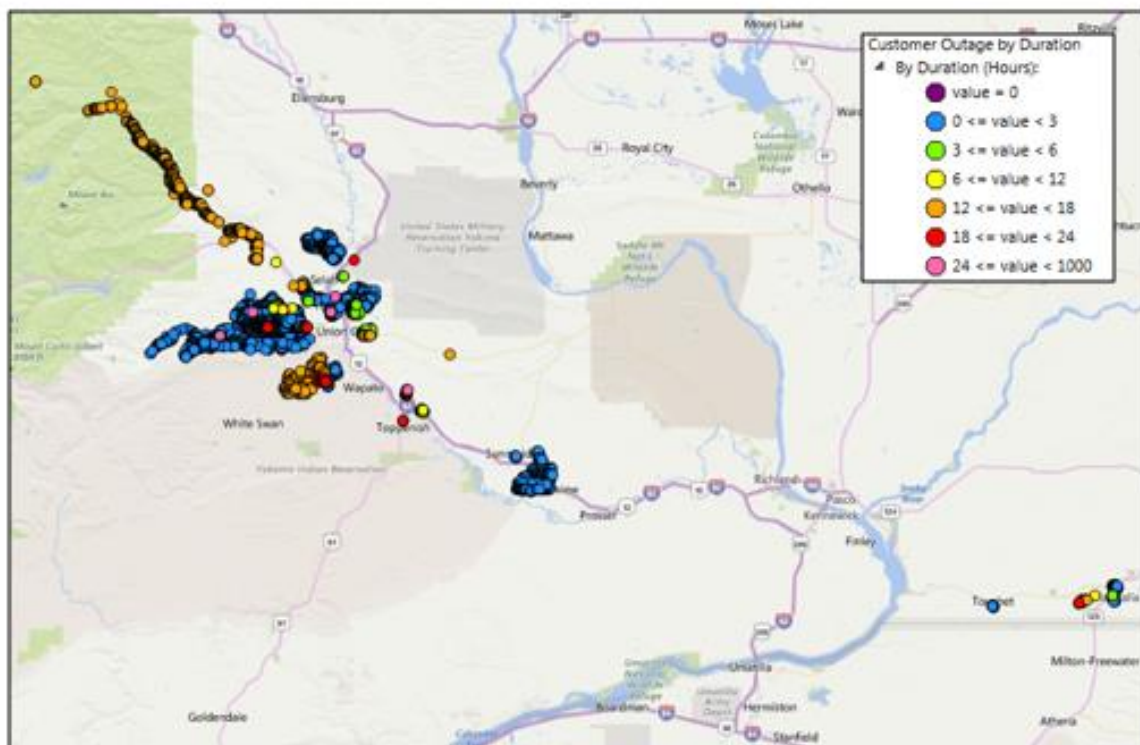
with the local operations center supporting, including several engineers, estimators, and logistics personnel.

The extensive amount of pole fires and damaged equipment limited the amount of switching operations that could be accomplished, extending the duration of outages. Additionally, pole fires were first extinguished to make safe, followed by repair and restoration. In addition, crews worked closely with local fire departments, who assisted with fire suppression when needed.

During the event, six outage events, affecting a total of 47 customers, lasted more than 24 hours. All but one event was attributed to a pole fire which required pole top extensions or a replacement of the pole before power could be restored. On the evening of October 22<sup>nd</sup> restorations efforts had stabilized.

Figure 1 below displays customer outages during the event by their duration. In total over 41 employees took part in the restoration efforts, replacing approximately 630 feet of conductor, 207 insulators, 8 poles, 16 pole extensions, 23 cross arms, and replacing more than 73 cutouts.

**Figure 1 Customer outages by duration**





### Restoration Intervals

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24+ Hrs.
15,078	12,581	2,450	47

### Restoration Resources <sup>1</sup>



Personnel Resources	
District Serviceman	1
Journeyman Estimator	2
Journeyman Lineman	1
Line Foreman	6
Lineman Representative	4
Lineman/Journeyman	11
Logistics Worker	1
Mechanic	3
Meter/Relay Tech Journeyman	1
Serviceman/ Journeyman	2
Stat Wireman Journeyman	1
Wireman Working Journeyman	1
Dispatcher	7
Materials	
Distribution Poles	7
Transmission Poles	1
Approximate Conductor Line (feet)	630
Transformers	7
Crossarms	23
Insulators	207
Cutouts	45
Line Fuses	20
Line Splices	28
Extension Pole Tops	16



### State Estimated Major Event Costs <sup>1</sup>

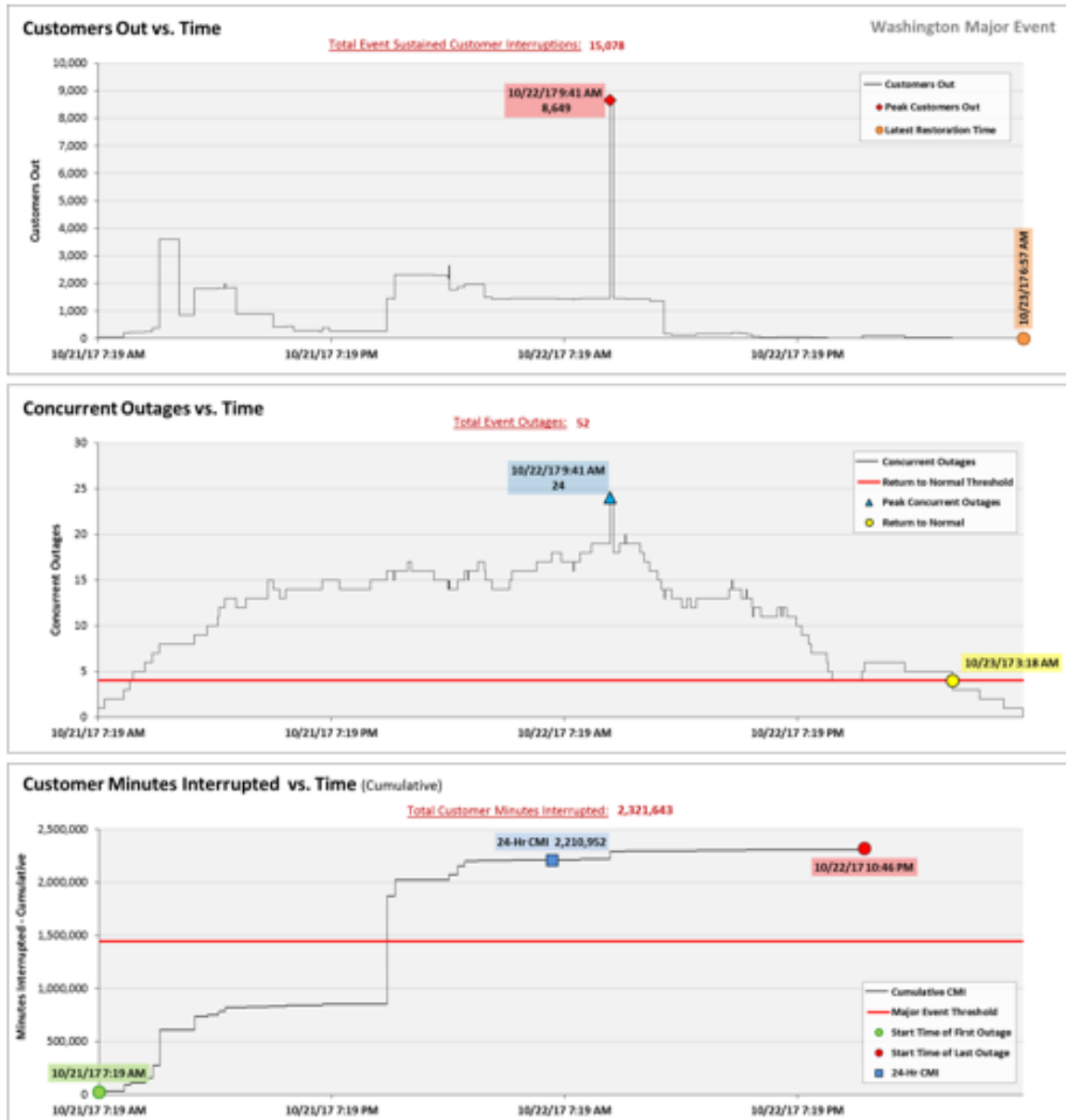
Estimate \$	Labor	Contracts	Materials	Overheads	Total
Capital	\$36,665	\$11,967	\$19,503	\$14,186	\$82,320
Expense	\$52,577	\$14,855	\$21,238	\$5,882	\$94,553
<b>Total</b>	<b>\$89,242</b>	<b>\$26,822</b>	<b>\$40,741</b>	<b>\$20,068</b>	<b>\$176,873</b>

<sup>1</sup> Data provided represents specific system records for personnel, resources, and costs. However additional resources whose participation did not get individually captured in transaction recording systems were utilized during the event, thus the data presented here effectively understates the resources, including cost, involved in restoring the system to normal.

## Major Event Declaration

Pacific Power is requesting designation of this event and its consequences to be classified as a “Major Event” for exclusion from network performance reporting with the IEEE 1366-2003/2012. This major event exceeded the company’s 2017 Washington threshold of 1,444,820 customer minutes lost (10.77 state SAIDI minutes) in a 24-hour period.

## Event Detail



## SAIDI, SAIFI, CAIDI by Reliability Reporting Region

Please see the attached system-generated reports.

**Report to the Washington Utilities and Transportation Commission**  
**Electric Service Reliability - Major Event Report**

Event Date:	November 7, 2017
Date Submitted:	December 15, 2017
Primary Affected Locations:	Walla Walla
Primary Cause:	Loss of Transmission
Exclude from Reporting Status:	Yes
Report Prepared by:	April Brewer
Report Approved by:	Heide Caswell / Kevin Putnam / David O'Neil / Pablo Arronte

### Event Description

On November 7, 2017, Washington experienced a major event when a 69 kV conductor splice failed. The failure caused the Walla Walla Substation circuit breaker to open, de-energizing five substations which feed 14 circuits and serve over 17,800 customers. Outage durations ranged from 10 minutes to 6 hours 19 minutes.

Event Outage Summary	
# Interruptions (sustained)	20
Total Customer Interrupted (sustained)	20,078
Total Customer Minutes Lost	3,192,035
State Event SAIDI	23.8 Minutes
CAIDI	159
Major Event Start	11/7/17 12:00 AM
Major Event End	11/8/17 12:00 AM

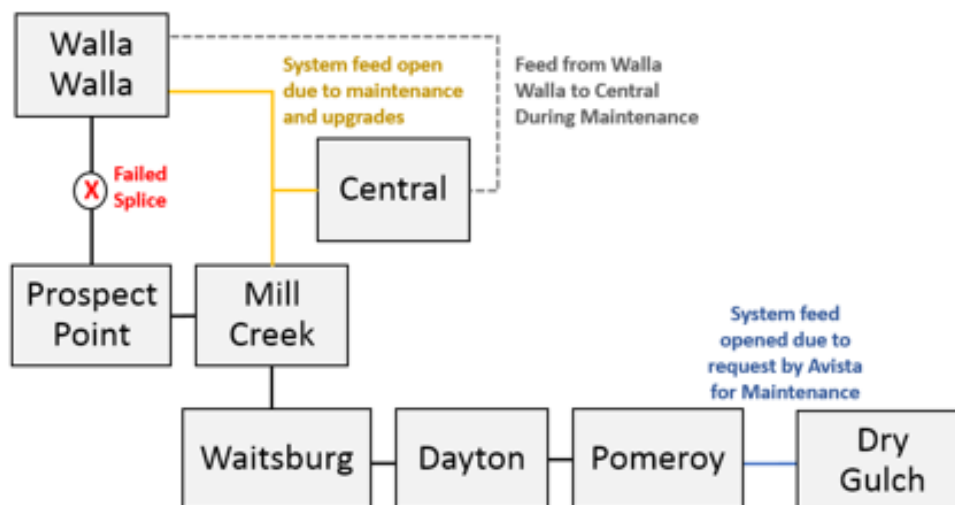
### Restoration Summary

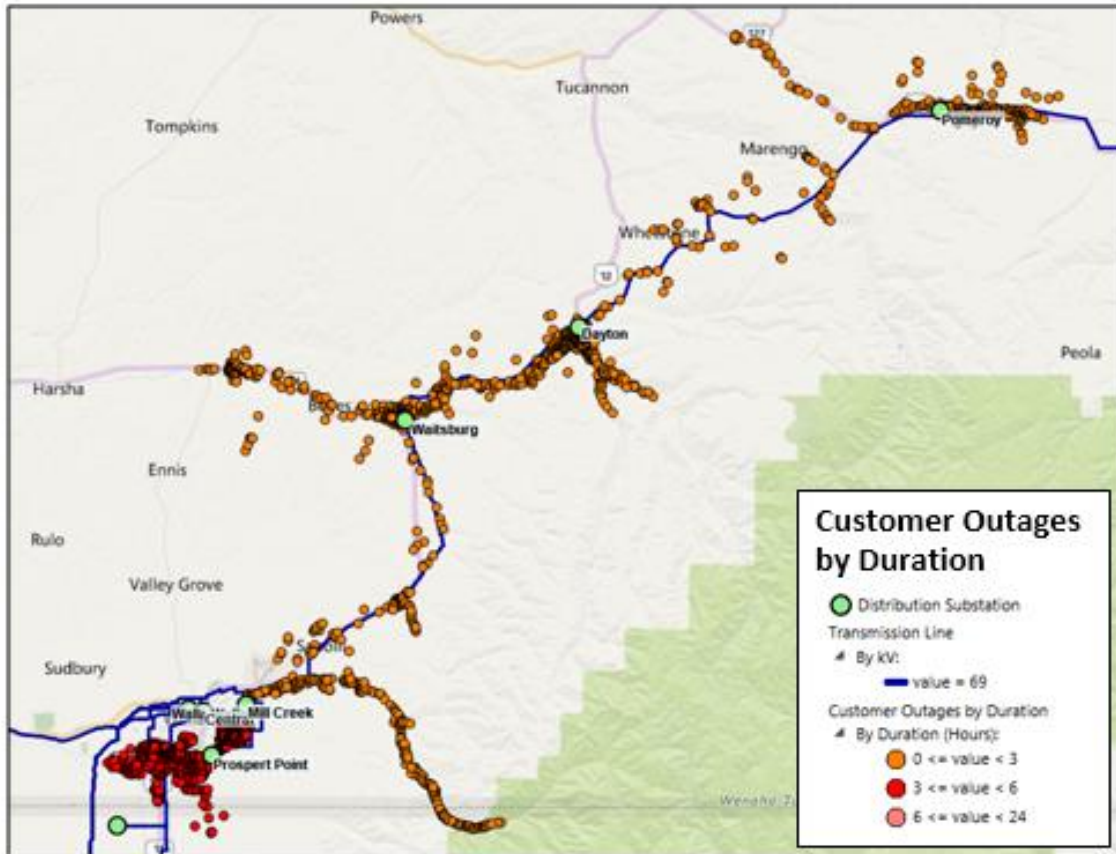
At 8:16 AM on November 7, 2017, Walla Walla, Washington, experienced a loss of transmission line event when a splice on the 69 kV line from the Walla Walla Substation to the Prospect Point substation failed. The event affected five substation; Prospect Point, Mill Creek, Waitsburg, Dayton, and Pomeroy. On November 6<sup>th</sup> the network was set into an abnormal configuration while maintenance and upgrades were being performed at the Central Substation. Under normal configuration Central Substation is in a loop configuration connecting feed to the five affected substations through the Mill Creek Substation. In addition to the work being performed at Central on the breaker serving the Mill Creek Substation, the 69 kV line between Pomeroy and Dry Gulch substations was de-energized at the request of Avista for mitigation

purposes while Avista performed work on the neighboring 230 kV line. This configuration put the five affected substations in a radial configuration.

When the conductor splice failed, dispatch quickly determined that feeds from the Pomeroy substation could be used and closed switches, energizing Pomeroy, Dayton, and Waitsburg Substation through SCADA, which restored power to 4,209 customers after 10 minutes. Restoration to the Mill Creek and Prospect substations required more work as crews had to open jumpers to isolate the Central Substation from Walla Walla-Mill Creek 69kV line. Supply from Walla Walla substation to Mill Creek was then re-established, restoring power to an additional 8,559 customers starting after 161 minutes. Throughout the restoration process operations incorporated concerns for in-rush current and cold load pickup in order to guide how rapidly individual circuits and groups of customers were restored. By 11:53 AM 93% of all customer outages were restored. At 2:05 PM the failed splice on the Walla Walla-Prospect Point line was repaired, fully energizing Prospect Point substation. At 2:35 PM restoration activities were completed. The below diagram outlines the system abnormal configurations during the event.

There were no company or commission customer complaints made regarding the major event.





### Restoration Intervals

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24+ Hrs.
20,078	12,779	7,299	0

### Restoration Resources <sup>1</sup>

Personnel Resources	
Estimator	1
Engineer	1
Relay Tech	3
Substation Journeyman	3
Field Journeyman	10
<b>TOTAL</b>	<b>18</b>

### State Estimated Major Event Costs <sup>1</sup>

Estimate \$	Labor	Material	Overhead	Total
Capital	\$17,855	\$0	\$1,074	\$18,929
Expense	\$15,982	\$0	\$0	\$15,982
<b>Total</b>	<b>\$33,837</b>	<b>\$0</b>	<b>\$1,074</b>	<b>\$34,911</b>

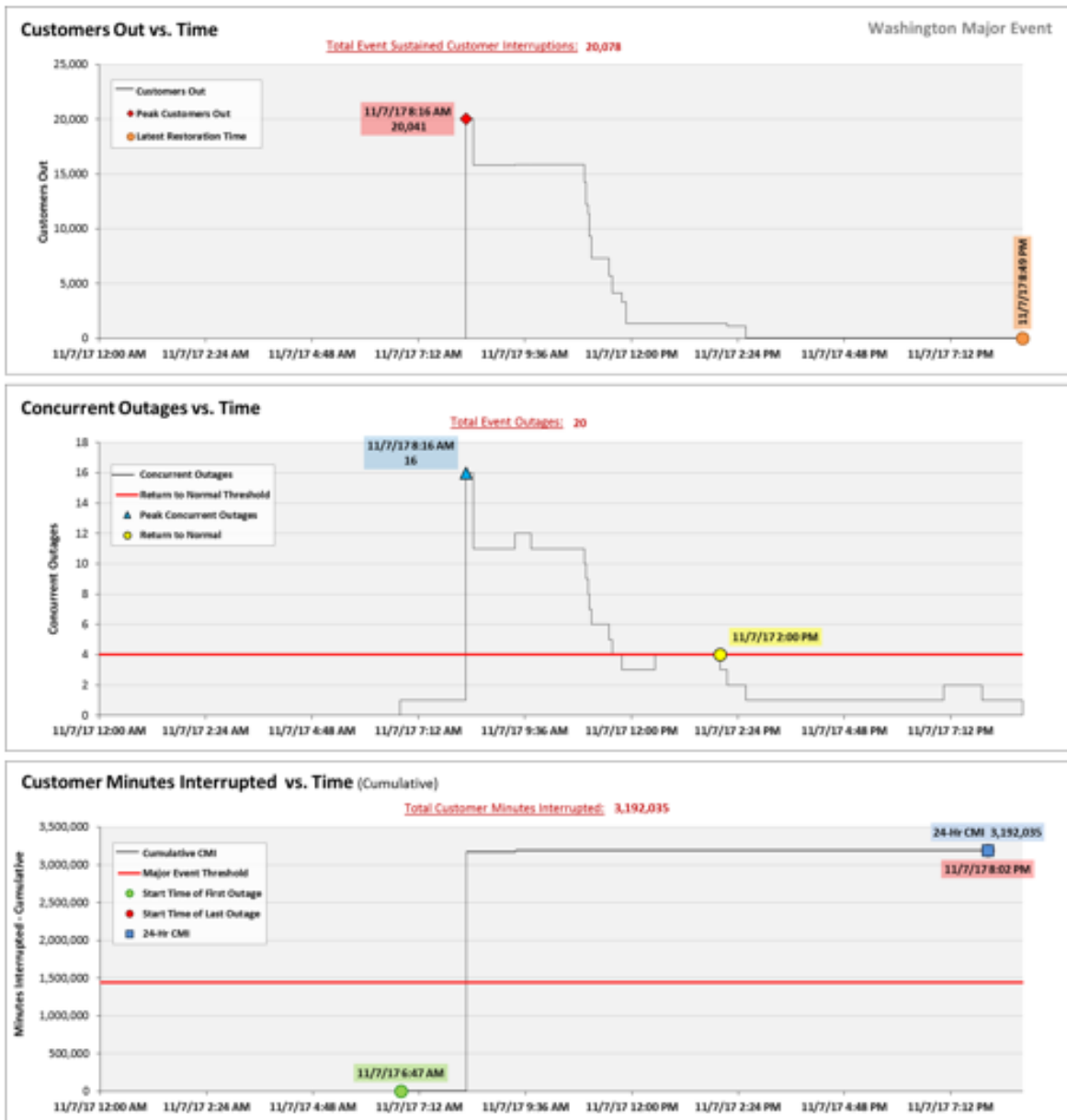
### Major Event Declaration

Pacific Power is requesting designation of this event and its consequences to be classified as a "Major Event" for exclusion from network performance reporting with the IEEE 1366-2003/2012. This major event exceeded the company's 2017 Washington threshold of 1,444,820 customer minutes lost (10.77 state SAIDI minutes) in a 24-hour period.

<sup>1</sup> Data provided represents specific system records for personnel, resources, and costs. However additional resources whose participation did not get individually captured in transaction recording systems were utilized during the event, thus the data presented here effectively understates the resources, including cost, involved in restoring the system to normal.



### Event Detail



### SAIDI, SAIFI, CAIDI by Reliability Reporting Region

Please see the attached system-generated reports.

**Report to the Washington Utilities and Transportation Commission**  
**Electric Service Reliability - Major Event Report**

Event Date:	December 29-31, 2017
Date Submitted:	February 8, 2018
Primary Affected Locations:	Walla Walla
Primary Cause:	Weather
Exclude from Reporting Status:	Yes
Report Prepared by:	April Brewer
Report Approved by:	Heide Caswell / Kevin Putnam / David O'Neil

### Event Description

On the morning of December 29, 2017, service areas across Southeastern Washington and Northeastern Oregon experienced a winter storm during which storm-related outages as ice accumulated on lines and trees caused more than 145 outage events. During the three day weather event 14,224 customer outages were experienced by customers served from the Walla Walla Operating area<sup>1</sup>; 13,113 of these customers reside in Washington. In Washington, tree and ice related outages resulted in 97% of all customer minutes lost and 86% of all customer interruptions.

Event Outage Summary	
# Interruptions (sustained)	125
Total Customer Interrupted (sustained)	16,679
Total Customer Minutes Lost	9,374,920
Event SAIDI	69.86 Minutes
CAIDI	562
Major Event Start	12/29/17 3:39 AM
Major Event End	1/1/18 12:00 AM

<sup>1</sup> The Walla Walla operating area serves customers in both Oregon and Washington. During the three day weather event, Washington and the Northeast reporting region of Oregon exceeded major event thresholds. The 2017 frozen customer count for Walla Walla is 30,263 customers (28,310 customers are served by substations originating in Washington and 1,723 customers are served by a substation originating in Oregon).

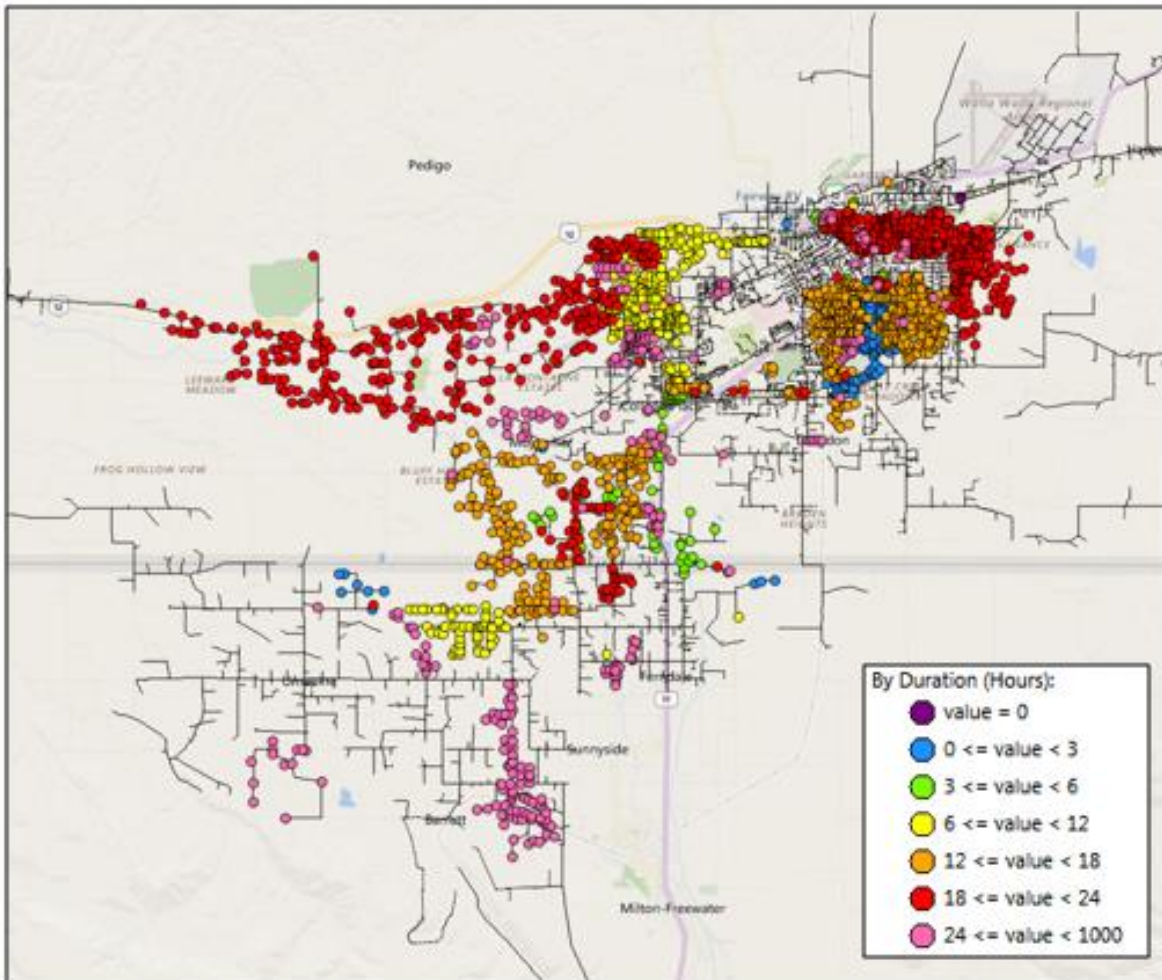
## Restoration Summary

On December 29, 2017, Walla Walla, Washington and the surrounding areas, generally considered within the Blue Mountains, experienced a severe ice storm. With some locations accumulating as much as a half an inch of ice, Walla Walla County issued a “Shelter in Place” warning to its residents. The storm significantly damaged equipment across the operating area as ice-loaded conductor taxed structures beyond their strength limits and trees and tree limbs impacted and damaged multiple spans of lines.

The extent of outages which occurred was more than local operations could handle and internal and external crew resources from Pendleton, Hermiston, Yakima, and Spokane were dispatched to assist in restoration activities. Ice-covered roads and fallen trees limited and slowed access to damaged equipment, delaying patrols and repairs. The nature of the outages meant multiple zones within circuits were often damaged, which also delayed restoration activities. Feeders which experienced this extensive damage in multiple locations were step restored as hazards were cleared and patrolled from protective device to protective device. Further, many of these customers experienced multiple outages as circuit protective equipment, including fuses, reclosers and breakers were opened during these stage restoration efforts. Together dispatch and crews worked to restore power through step restorations whenever possible, restoring power to as many customers as rapidly as possible.

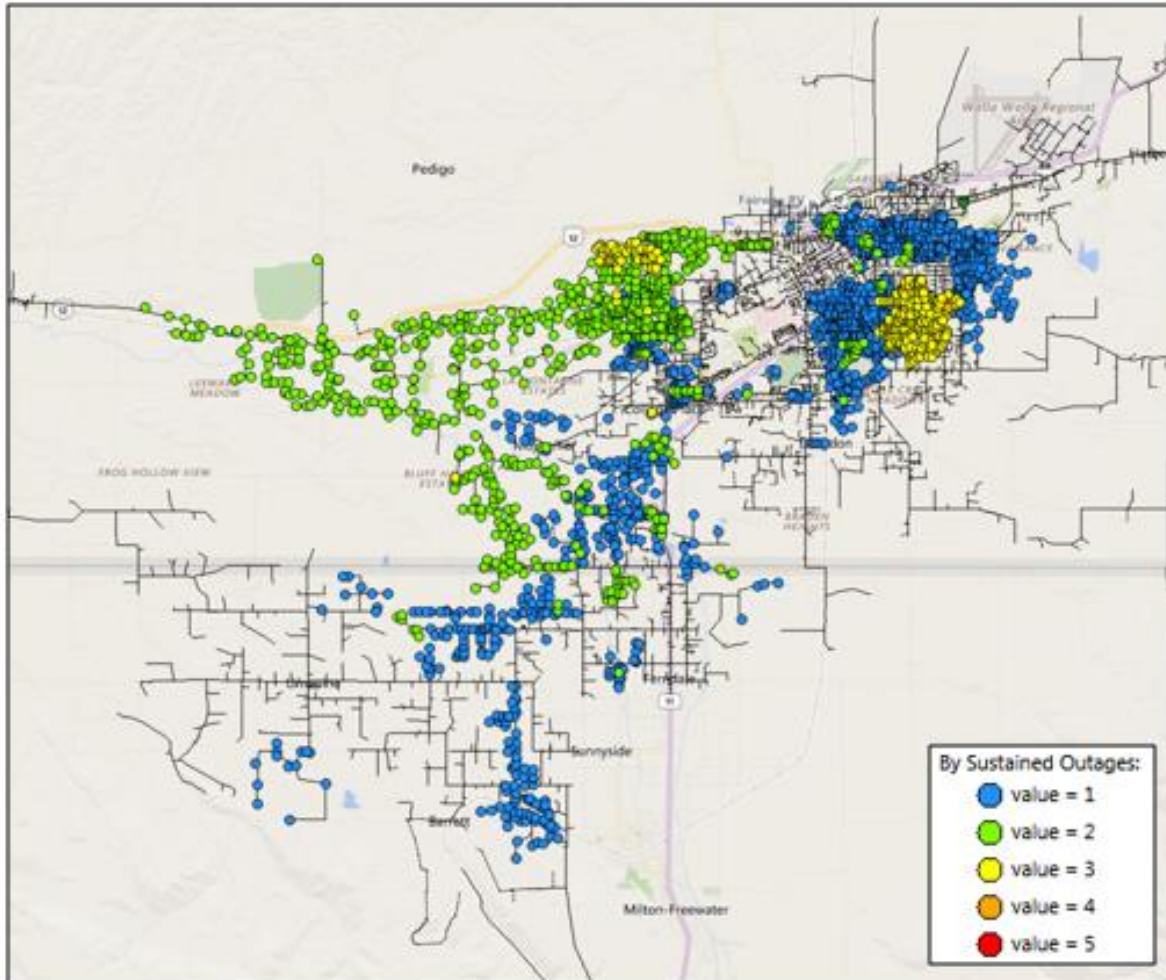
During the event a total of 529 customers in Washington experienced an outage over 24 hours. All but one event can be attributed to weather. On the morning of January 1, 2018 restoration efforts had stabilized and outage levels had returned to normal. Over 58 employees took part in the restoration efforts, replacing approximately 8,545 feet of conductor, 26 insulators, four poles, eight transformers, ten cross arms, 27 fuses, 1,150 line splices and replacing more than 11 cutouts.

Figure 1 below displays customer outages during the event as shown by their duration while figure 2 shows the number of outage events each customer experienced. Figure 3 is a photo of an ice-laden tree which downed lines, blocking access, and creating dangerous situation.



**Figure 1** Customer outages by duration





**Figure 2** Number of outage events experienced by a customer



**Figure 3** One of several ice-loaded trees which downed lines.

### Restoration Intervals for Customers served in Washington

Total Customers Sustained	< 3 Hrs.	3 - 24 Hrs.	24-48 Hrs.	48+ Hrs.
16,679	5,646	10,504	524	5

### Restoration Resources <sup>2</sup>

Personnel Resources	
Lineman/Journeyman	20
Contract Personnel	9
Substation Journeyman	2
General Foreman	1
Estimator	4
Relay Technician	1
Logistics Worker	4
Mechanic	1
Collector	1
Dispatcher	1
Administrative	13
Clerk	1
Materials	
Distribution Poles	4
Approximate Conductor Line (feet)	8,545
Transformers	8
Crossarms	10
Insulators	26
Cutouts	11
Line Fuses	27
Line Splices	1,150
Guy Wire	15

### State Estimated Major Event Costs <sup>2</sup>

Estimate \$	Labor	Contracts	Materials	Overheads	Total
Capital Expense	\$6,031	\$56,939	\$19,595	\$6,358	\$88,923
Total	\$316,373	\$221,320	\$2,274	\$3,541	\$543,508
	\$322,404	\$278,259	\$21,869	\$9,899	\$632,431

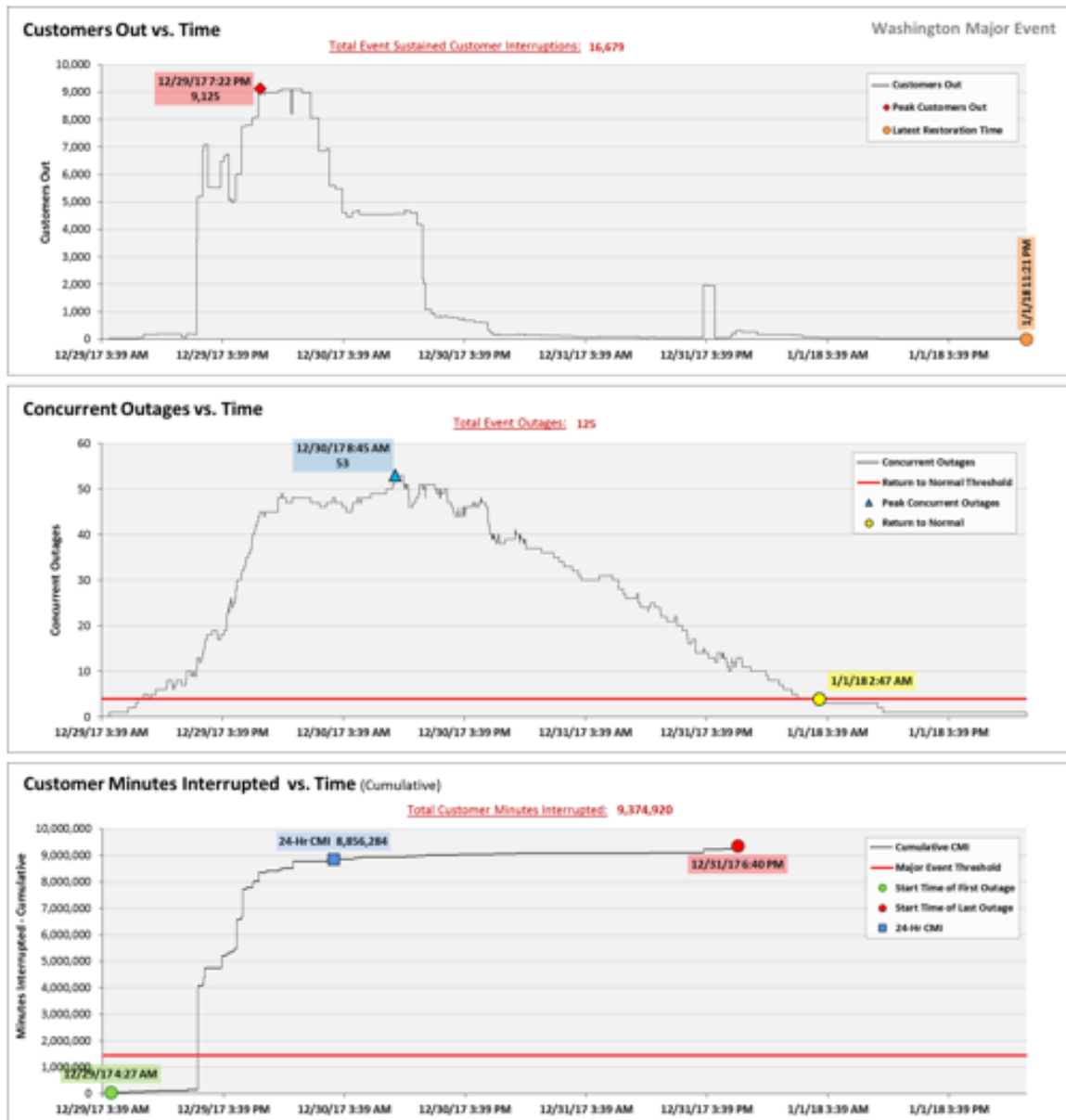
<sup>2</sup> Data provided represents specific system records for personnel, resources, and costs; and is specific to the event, not inclusive of state delineation. However additional resources whose participation did not get individually captured in transaction recording systems were utilized during the event, thus the data presented here effectively understates the resources, including cost, involved in restoring the system to normal.



## Major Event Declaration

Pacific Power is requesting designation of this event and its consequences to be classified as a “Major Event” for exclusion from network performance reporting with the IEEE 1366-2003/2012. This major event exceeded the company’s 2017 Washington threshold of 1,444,820 customer minutes lost (10.77 state SAIDI minutes) in a 24-hour period.

## Event Detail



## SAIDI, SAIFI, CAIDI by Reliability Reporting Region

Please see the attached system-generated reports.