Avista Utilities

Customer Service Quality and Electric System Reliability for 2017

APRIL 2018

Avista Utilities Customer Service Quality and Electric System Reliability for 2017 – *Revised Report*

Avista originally filed this report on April 30, 2018 but has since identified the need to make certain corrections, which are provided in this revised report dated June 27, 2018.

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Executive Summary

Avista's Service Quality and Reliability Report provides the annual performance results for the Company's "Service Quality Measures" program and for its overall Electric System Reliability for 2017. Results for the service quality measures have been incorporated into the Electric System Reliability Report the Company files each year with the Washington Utilities and Transportation Commission ("WUTC" or "Commission").

Background

Prior to the 2016,[1] Avista annually submitted a technical report to the Commission detailing its electric system reliability performance for the prior year. Our definition of "electric system" for this report has always referred to our overall network[2] of transmission lines, substations, and the distribution lines, or "feeders," that carry electricity to every home and business in our Washington and Idaho service area. "System reliability" refers to the various measures of the number of times during the year that our customers experience an electric service outage (number of outages) and the average length of time of these outages (outage duration). In accordance with the Commission's rules,[3] the Company established a baseline year (2005) for each of its reliability measures and then annually compares the results for each reporting year with these baseline statistics. In addition to reporting annual statistics, Avista must also report any changes to the methods used to collect and report the results, identify the geographic areas of greatest reliability concern on the Company's electric system, and explain our plans to improve reliability performance in those areas. Finally, Avista reports the number of complaints from its customers related to power quality and system reliability. The detailed reporting requirements are listed under definitions and electric system reliability reporting requirements in Appendix A. Avista files its annual electric system reliability report with the Commission by April 30th each year.

In early 2015, Avista engaged Commission Staff and representatives of the Public Counsel Division of the Washington Office of the Attorney General and the Energy Project

[1] 2015 reporting year.
[2] Entire electric system, irrespective of state jurisdiction.
[3] Washington Administrative Code (*WAC) 480-100-393.*

(collectively, the "Parties") to develop a set of service quality measures to be reported to the Commission and Avista's customers each year (in addition to the electric system reliability report). This effort reflected the interest of Staff in having each of its regulated energy utilities report annually on their service quality performance, and was not driven by any general or specific concerns regarding Avista's customer service performance. Through the course of these discussions Avista and the Parties agreed on a set of service measures and accompanying benchmarks and reporting requirements that, taken together, provide an overall assessment of the quality of the Company's service to our customers. These measures, referred to collectively as Avista's "Service Quality Measures Program," include:

- ✓ Six (6) individual measures of the level of customer service and satisfaction that the Company must achieve each year;
- ✓ Reporting on two (2) measures of our electric system reliability;
- ✓ Seven (7) individual service standards where Avista provides customers a payment or bill credit in the event we do not deliver the required service level ("customer guarantees").

Under our agreement, the Company also reports to its customers and the Commission annually on its prior-year performance in meeting these customer service quality and reporting requirements. Because these performance measures are related, at least in part, to electric system reliability, Avista includes this report as part of its annual electric system reliability report. The Company's reporting requirements[4] under this program were approved by the Commission in June 2015. Avista is currently reporting on the 2017 results of our Service Quality Measures Program.

Customer Service Measures - Results for 2017

Listed in the table below are the six customer service measures, including their respective service requirements (benchmarks), and the Company's performance results in meeting them in 2017. Avista achieved all of its customer service benchmarks for the year.

[4] Avista's reporting requirements are described in our Washington Schedule 85 for electric service and Schedule 185 for natural gas service, in Dockets UE-140188 and UG-140189 (consolidated).

Table 1. Results for Avista's Customer Service Measures in 2017.

Customer Service Measures	Benchmark	2017 Performance	Achieved
Percent of customers satisfied with our Contact Center services, based on survey results	At least 90%	93.6%	✓
Percent of customers satisfied with field services, based on survey results	At least 90%	95.2%	✓
Number of complaints to the WUTC per 1,000 customers, per year	Less than 0.40	0.16	✓
Percent of calls answered live within 60 seconds by our Contact Center	At least 80%	81.5%	✓
Average time from customer call to arrival of field technicians in response to electric system emergencies, per year	No more than 80 minutes	39.9 Minutes	✓
Average time from customer call to arrival of field technicians in response to natural gas system emergencies, per year	No more than 55 minutes	50.29 Minutes	✓

Electric System Reliability - Results for 2017

The tables below list the two measures of electric system reliability to be reported by Avista each year as part of its service quality measures program. Because the annual electric reliability results often vary substantially year-to-year (the case for any electric utility's system), it is difficult to derive a meaningful assessment of the Company's system reliability from any single-year's result. Consequently, in addition to reporting the current-year result for each measure, we also report the average value of each measure for the previous five year period, the average for the current five-year period (which includes the results for the current year - 2017), and the "five-year rolling average" from 2005 – 2017. These data provide our customers some context for better interpreting each year's reliability results.

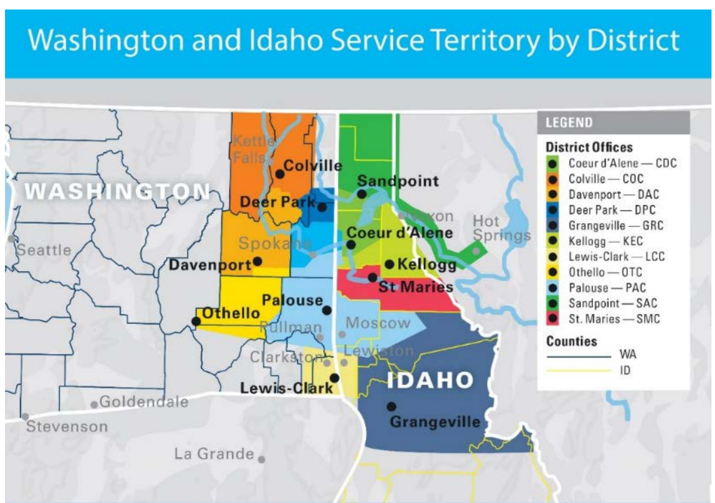


Table 2. Results for Number of Outages on Avista's System in 2017 (SAIFI).[5]

Number of Outages	2017 System Results	Current 5-Year Average (2013-2017)	Previous 5-Year Average (2012-2016)
Average number of sustained outages (interruptions) per customer for the year (SAIFI)[6]	1.20	1.05	1.04

Table 3. Results for Duration of Outages on Avista's System in 2017 (SAIDI).

Outage Duration	2017 System Results	Current 5-Year Average (2013-2017)	Previous 5-Year Average (2012-2016)
Average duration of sustained outages (interruptions) per customer for the year. (SAIDI)[7]	183 Minutes	151 Minutes	142 Minutes

The two charts below show the "five-year rolling average" for each reliability measure from 2005 through 2017. As shown in the figures, the long-term trend for each reliability measure is fairly stable during this period. The trend in number of outages is slightly improving, while that for outage duration is slightly declining. Though the Company formally reports its reliability results, as noted above, for its entire electric system, beginning in 2015 Avista agreed to also report its annual results for only its Washington system. The Washington-only number of average electric system outages per customer in 2017 was 0.83, and the average total outage duration per customer was 127 minutes.

[5] For a more-detailed definition of these reliability measures please refer to Appendix B.
[6] See Appendix B for calculation of indices.
[7] See Appendix B for calculation of indices.

Figure 1. Historic Five-Year Rolling Average for Number of Electric Outages on Avista's Electric System (SAIFI).

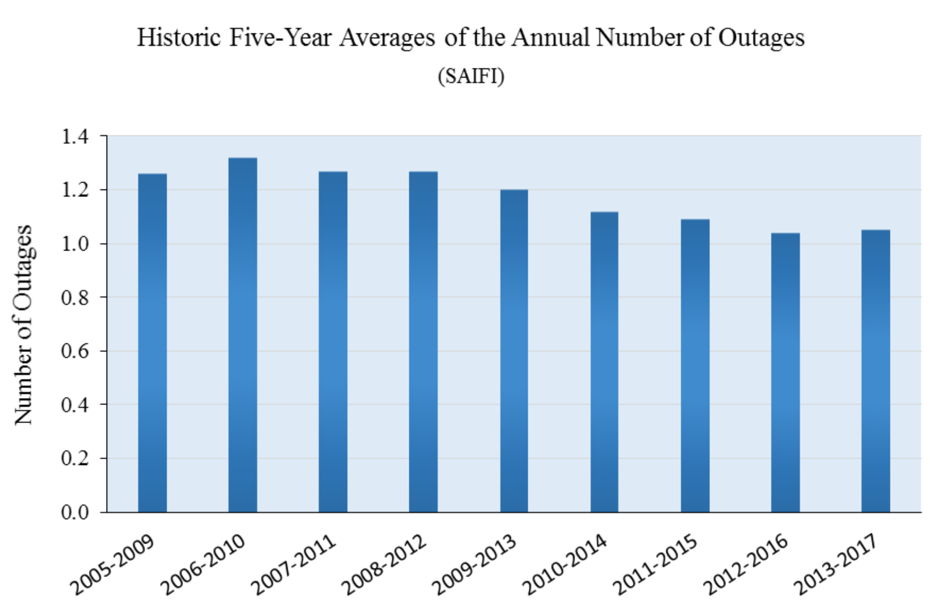
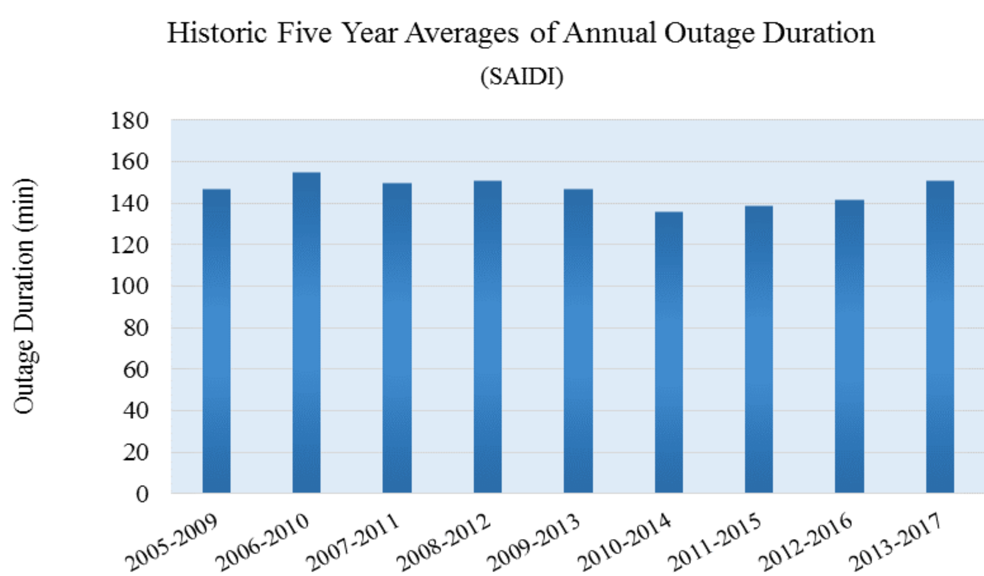


Figure 2. Historic Five-Year Rolling Average for Duration of Outages on Avista's Electric System (SAIFI).



Customer Service Guarantees – Results for 2017

Listed in the table below are the seven types of service for which we provide "customer service guarantees," and the Company's performance results in meeting them in 2017. In the cases we do not fulfill a Customer Service Guarantee, we provide the customer a bill credit or payment in the amount of $50 in recognition of that inconvenience. All costs associated with the payment of customer service guarantees are paid by the Company's shareholders, and are not paid by our customers in their rates for service or otherwise.

Table 4. Results for Avista's Customer Service Guarantees in 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Keeping Our Electric and Natural Gas Service Appointments scheduled with our customers	1,584	11	$550
Restore service within 24 hours of a customer reporting an outage (excluding major storm events)	30,669	23	$1,150
Turn on power within a business day of receiving the request	9,557	0	$0
Provide a cost estimate for new electric or natural gas service within 10 business days of receiving the request	3,929	0	$0
Investigate and respond to a billing inquiry within 10 business days if unable to answer a question on first contact	1,623	0	$0
Investigate a reported meter problem or conduct a meter test and report the results within 20 business days	1,082	1	$50
Notify customers at least 24 hours in advance of a planned power outage lasting longer than 5 minutes	17,079	115	$5,750
Totals	**65,523**	**150**	**$7,500**

Electric System Reliability Report for 2017

Avista reports a range of reliability statistics each year in its electric system reliability report, filed annually with the Commission. Though two of these measures are also reported under the Company's service quality measures program, described above, this report adheres to a separate set of reporting requirements, distinct from those in Avista's service quality measures program. The four primary reliability statistics (or indices) that Avista reports on each year are briefly described below. These measures are derived from technical engineering statistics, which is important in promoting standardized reporting across the utility industry, however, the Company also uses more generic names for these outage measures (in bold font) to make them more easily understood for a range of audiences in the context of this report.

- ✓ **Number of Outages** – known technically as the System Average Interruption Frequency Index or "SAIFI," is the average number of sustained interruptions (outages) per customer for the year.
- ✓ **Brief Outages** – known technically as the Momentary Average Interruption Event Frequency Index or "MAIFI," is the average number of momentary interruptions (outages) per customer for the year.
- ✓ **Outage Duration** – known technically as the System Average Interruption Duration Index or "SAIDI," is the average duration of sustained interruptions (outages) per customer for the year.
- ✓ **Restoration Time** – known technically as the Customer Average Interruption Duration Index or "CAIDI," is the average time it takes to restore a service interruption (outage) for those customers who actually experienced an outage during the year.

In addition to these four primary reliability metrics, Avista also tracks the following measure:[8]

- ✓ **Multiple Outages** – known technically as Customers Experiencing Multiple Sustained Interruptions or "CEMI," is the number of customers who experience greater than an identified or set number of interruptions (outages) during the year.

All of these reliability statistics and the methods of their calculation are discussed in detail later in the report, and in Appendix B.

Results of our four primary measures for 2017 are listed in the table below. In addition to the current-year results we have also listed the average values for the previous five-year period for each measure, along with the 2005 baseline value.

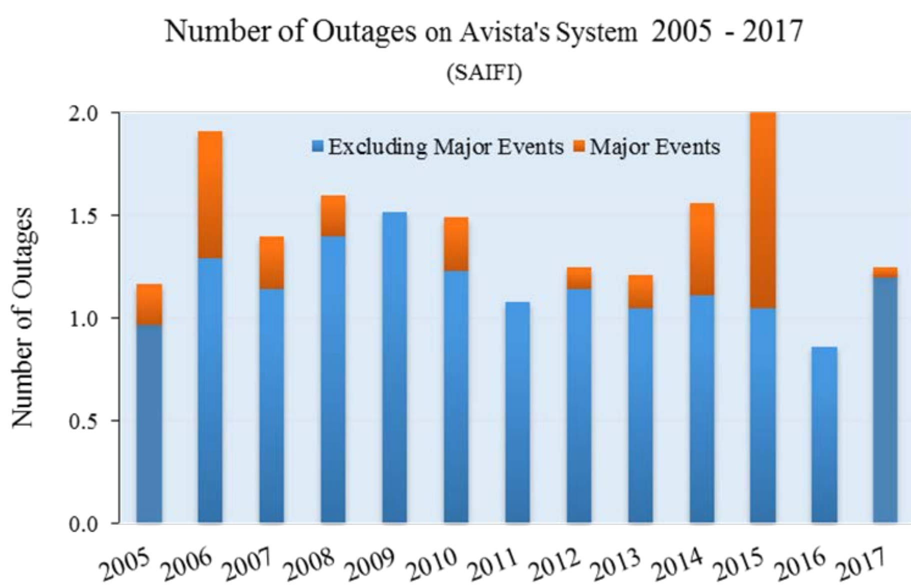
[8] Though not included in this report, the Company also tracks what we refer to as "Multiple and Brief Outages" – known technically as Customers Experiencing Multiple Sustained Interruptions and Momentary Interruption Events or "CEMSMI," this is the number of customers experiencing multiple sustained interruptions (outages) and momentary interruptions (brief outages).

Table 5. Results for Avista's Primary Electric System Reliability Measures for 2017.

Reliability Index	Previous 5-Year Average 2012-2016[9]	Baseline Value 2005	Result for 2017 Reporting Year
Number Outages[10]	1.04	0.97	1.20
Brief Outages[11]	2.22	3.58	2.46
Outage Duration[12]	142	108	183
Restoration Time[13]	138	112	153

The number of outages reported each year on Avista's system is provided in the figure below, shown with and without the outages associated with major event days.

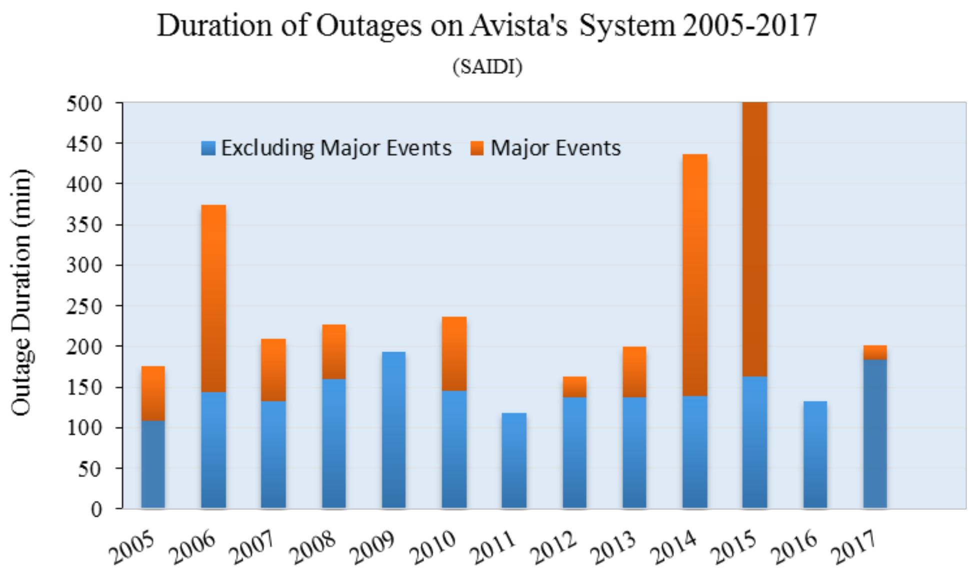
Figure 3. Number of Outages on Avista's Electric System (SAIFI) 2005 – 2017.



The duration of outages each year are shown in the figure below, including the outages associated with major event days.

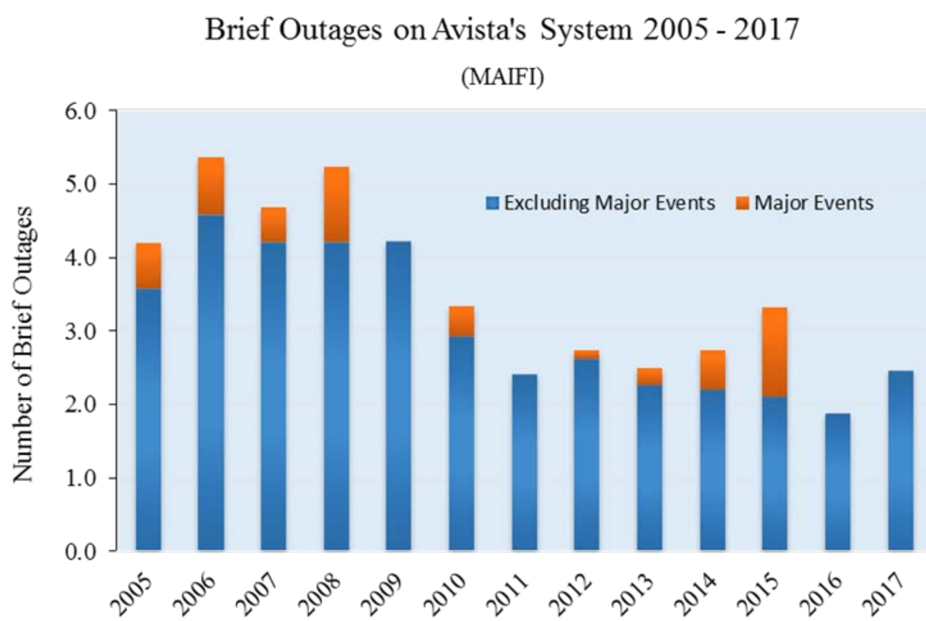
[9] Excludes Major Event Days.
[10] SAIFI
[11] MAIFI
[12] SAIDI
[13] CAIDI

Figure 4. Duration of Outages on Avista's Electric System (SAIDI) 2005 – 2017.



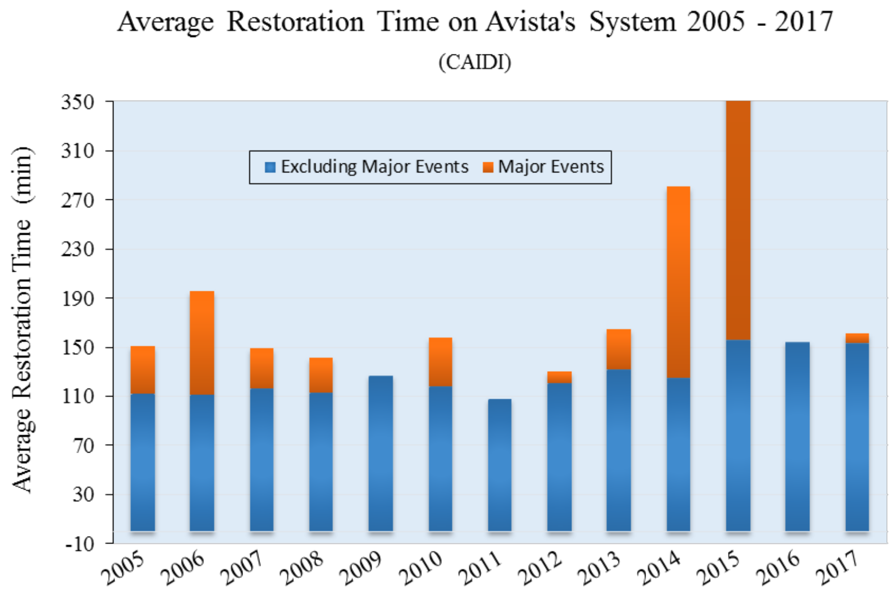
The number of momentary outages reported by year on Avista's system is shown in the figure below, including those outages associated with major event days.

Figure 5. Number of Brief Outages on Avista's Electric System (MAIFI) 2005 – 2017.



The annual average outage restoration time in minutes for those customers who experienced an outage on Avista's system is shown in the figure below, including those outages associated with major event days.

Figure 6. Outage Restoration Time on Avista's Electric System (CAIDI) 2005 – 2017.



Customer Service Quality Measures Program

Background

Avista has a long history of providing safe, reliable and cost-effective service to our customers. Our culture of service is the result of an enduring leadership focus, an organizational ethic of service, actively listening to our customers, and the dedication and commitment of our employees. We also understand the importance of setting goals, measuring performance, and responding through continuous improvement. For many years, we have conducted a quarterly survey of our customers to measure and track their satisfaction with the Company's customer and field services. We have also participated in other survey efforts, such as the JD Power customer satisfaction survey, and have worked to align our internal systems (such as incentive compensation) with our customer satisfaction and service performance. We understand that good customer service is more complex than is represented by a common suite of survey metrics, such as the contact center "average handle time." It requires awareness of, and attention to a host of factors that contribute in some way to the overall service our customers experience with Avista. A few examples include the inherent complexity of a business process, the intuitiveness and appeal of our website, the availability and ease of our self-service options, the apparel worn by our employees, wearing protective booties while inside the customer's home, or calling the customer to make sure their service is restored once we have finished outage repairs.

Keeping Pace with Customer Expectations

We understand that customers' expectations are constantly changing and that the quality and/or nature of our service must evolve over time to keep pace. As an example, new technologies that emerged 20-30 years ago allowed us to better measure and track the service performance of our contact centers. Equipped with new and accurate measures of a broad range of service attributes, we were able to establish new and responsive performance goals and to implement the technology, process, behavioral, and training improvements required to achieve these goals. This concerted effort allowed us to effectively meet the changing service expectations of our customers, and resulted in some industry recognition when we were named the best utility call center in the nation in 1999 by Call Center magazine. Continuing improvements since that time have allowed us to continue to keep pace with the needs and expectations of our customers.

In contrast to the long-term cycle of continuous improvement described above, some improvements in service have come about more abruptly, such as in 1996 when the Company experienced an unprecedented ice storm that devastated many parts of our electric transmission and distribution system. The challenge of managing an event of that magnitude with then-conventional systems, accompanied by the natural frustration of our customers and other stakeholders, prompted us to initiate the development of a state-of-the-art geographical information system (GIS)-based outage management system, launched in 2004. This system provided us much greater visibility of outage events, which enabled us to more-efficiently manage the restoration process. But just as importantly, it allowed us to provide our customers with timely information that is important to them during an outage, such as maps showing the location and extent of the outage, early and updated estimates of outage restoration time, and the option to receive an automated call from the Company when service has been restored.

In recent years, we have placed an emphasis on improving our customers' experience and satisfaction by improving the quality of the many service "touchpoints" where our customers interact with Avista. In this effort we inventoried the many touchpoints across our business and developed a programmatic approach for evaluating and improving them - from the customers' perspective - one touchpoint at a time. From 2012 to 2014 we commissioned 39 employee "touchpoint teams" to assess and improve a range of service touchpoints. Through this process the Company has made numerous individual improvements to the overall quality of service we provide our customers.

Most recently, as customers' expectations regarding technology and self-service continue to advance, we are making strides to keep pace with these changes. In early 2015, the Company launched new customer information and work management systems. These new platforms provide the foundation for future technologies, such as the new outage information center launched in November 2015, a mere two weeks before a severe wind storm, the most devastating storm the Company has experienced in its history, hit our service territory. The new outage information center provides real time updates and alerts (via emails or text messages) to customers about outages in their area and can be accessed at www.avistautilities.com from a computer or smart phone. The next phase of the outage information center, released in June 2016, was a mobile application ("app") that customers are able to download to their smartphone. In February 2017, the Company launched a new payment experience as part of its overall website replacement effort. This new tool provides easier self-service for customers through the Company's website from a computer or smart phone. The full replacement of our customer website (myavista.com) was completed in phases throughout 2017. Lastly, the Company's pending deployment of advanced metering infrastructure in our Washington service territory will provide our customer a range of benefits, including the opportunity to better understand and manage their energy usage and costs.

Striking the Right Balance

As described above, Avista, like every business, is continuously engaged in the very granular and evolving work of assessing our customers' expectations and evaluating our capabilities and performance in meeting them. The key point here is that Avista must constantly judge whether its overall service quality meets the expectations of our customers, in balance with what it costs to deliver that level of service. We believe we are striking a reasonable balance among our customers' expectations, the characteristics of our extensive and often rural system, the quality of our services, and the cost associated with delivering those services. And when we sense that we are out of balance in a certain area, we make changes and investments needed to achieve, in our judgment, the optimal level of service. The examples described above help illustrate this point. As another example, in our customer contact center, we have for many years maintained a 'grade of service' of answering 80% of our customer calls within sixty seconds. While there are numerous examples of industry norms where the grade of service is higher than Avista's, we have chosen to maintain our service level because, on balance, our customers are satisfied with our overall customer service. And we believe it is not cost effective to increase our customers' costs to achieve a higher level of service in this one area, when they are already very satisfied with the service they receive from our customer contact center.

The Value of Setting Goals and Measuring Performance

We believe that measurement is, inherently, a good thing. It promotes organizational focus and accountability and always stimulates ideas for improvement. We also know from experience that it is very important to measure the right things, and for the right reasons. We all naturally take steps to promote the things that get measured, but sometimes at the expense of other things that (while unmeasured) can be much more important. For many years we have measured the satisfaction of our customers through a quarterly survey we refer to as "Voice of the Customer." The purpose of the survey is to measure and track customer satisfaction for Avista Utilities' "contact" customers – i.e., customers who have contact with Avista through the Call Center and/or field personnel with work performed operationally in the field. Customers are asked to rate the importance of several key service attributes, and are then asked to rate Avista's performance with respect to the same attributes. Customers are also asked to rate their satisfaction with the overall service received from Avista Utilities. Finally, customer verbatim comments are also captured and recorded. Our most recent 2017 year-end results show an overall customer satisfaction rating of 94.5% across our Washington, Idaho, and Oregon operating divisions. This rating reflects a positive experience for customers who have contacted Avista related to the customer service they received.

Adopting the Service Quality Measures Program

It is from the above perspective that we approached the process of working with Commission Staff and other interested parties in 2015 to develop and implement a set of service quality measures for Avista. We believe the Company's history of customer service, including the level and quality of service we provide today, effectively meets the needs and expectations of our customers, and that it provides them with cost-effective value. We believe the service quality measures adopted by the Commission[14] for Avista, as contained in this report, represent a reasonable set of service expectations for our customers, the Commission, and our Company.

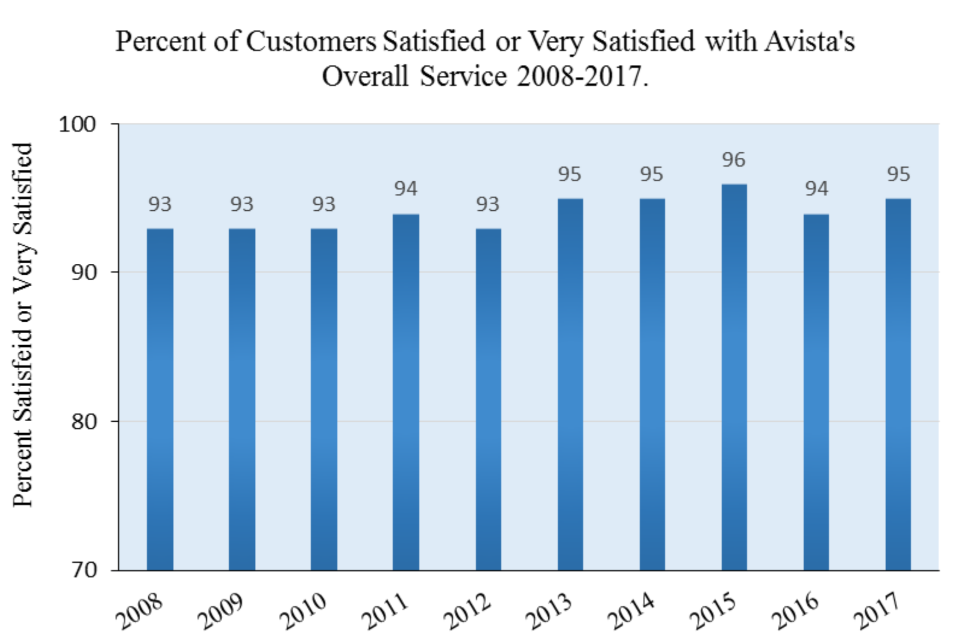
Customer Service Measures

As noted above, there are many points of service our customers have with Avista and each contributes to the overall impression they have of the Company and the level of satisfaction they have with our services. While for many years we have tracked our customers' satisfaction with primary services such as our customer contact center and field services, we have also been interested in knowing whether our performance is meeting our customers' broader service expectations. As part of our Voice of the Customer survey we have asked our customers to rate their level of satisfaction with the overall service they

[14] On June 25, 2015 the Commission approved Avista's Service Quality Measures Program as filed by the Company on May 29, 2015. Order 06 - Final Order Approving Avista's Service Quality Measures Program Compliance Filing, in Dockets UE-140188 and UG-140189 (consolidated).

receive from the Company. We believe this overall measure is an important barometer of our customers' satisfaction with the entirety of the integrated services and value they receive from Avista. As show in the figure below, the overall satisfaction of Avista's customers (either satisfied or very satisfied) has ranged between 93% and 96% over the past eight years. These results are similar to our customers' satisfaction with our contact center and field services for this same time period. Accordingly, we believe the results of the six customer service measures contained in this report, taken together, provide a reasonable assessment of our customers' overall satisfaction with the quality and value of our service.

Figure 7. Percent of Customers Satisfied or Very Satisfied with Avista's Overall Service Level 2008-2017.



Customer Satisfaction with the Telephone Service provided by Avista's Customer Service Representatives

As part of Avista's Service Quality Measures program, the level of our customers' satisfaction with the telephone service provided by the Company's contact center will meet or exceed a benchmark of 90%.[15]

Several factors influence our customers' satisfaction with the quality of telephone service provided by our customer service representatives and contact center. We measure the importance of these factors to customers as well as their satisfaction with them each year. These factors, including our customers' satisfaction (either satisfied or very satisfied) for each factor in 2016 are listed below.

- ✓ The customer service representative handling the customer's call in a friendly, caring manner. **(97%)**
- ✓ The customer service representative being informed and knowledgeable. **(94%)**
- ✓ The customer service representative meeting the customer's needs promptly. **(94%)**
- ✓ The customer service representative giving the customer all the information they need in one call. **(95%)**
- ✓ Being connected to a customer service representative in a reasonable amount of time. **(96%)**

In February of 2017 the Company celebrated its two-year anniversary of launching its new customer information and work and asset management system (Project Compass). Since the launch our customer contact center has continued to learn and adapt to the new system, and to leverage added value from its greater capabilities. Because our last customer

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[15] The level of Customer satisfaction with telephone service, as provided by the Company's Contact Center, will be at least 90 percent, where:

a. The measure of Customer satisfaction is based on Customers who respond to Avista's quarterly survey of Customer satisfaction, known as the Voice of the Customer, as conducted by its independent survey contractor;
b. The measure of satisfaction is based on Customers participating in the survey who report the level of their satisfaction as either "satisfied" or "very satisfied"; and
c. The measure of satisfaction is based on the statistically-significant survey results for both electric and natural gas service for Avista's entire service territory for the calendar year, and if possible, will also be reported for Washington customers only.

information system was in place for over 20 years the Company's practices and processes were very-tightly adapted to that system, and our customers were accustomed to these processes. In adapting to the new system, our customer contact center successfully maintained high levels of customer satisfaction in 2017. This outcome is due to Avista's continued diligence in listening to its customers, being attentive to their needs, and continuously training and educating its contact center representatives.

2017 Results – The annual survey results for this measure of customer satisfaction show that 92.7% percent of our customers were satisfied with the quality of the telephone service they received from our customer service representatives. Overall, 78.5% of our customers were "very satisfied" and 14.2% were "satisfied" with the quality of our service.

Table 6. Customer Satisfaction with Avista's Contact Center Representatives in 2017.

Customer Satisfaction with Avista's Contact Center Representatives	Service Quality	2017 Performance	Achieved
Percent of customers either satisfied or very satisfied with the Quality of Avista's Customer Contact Center Representatives	90% or Greater Satisfied	93.6%	✓

Prior to the development of the service quality measures program, Avista did not separately track or report results for any of our state jurisdictions, and for reporting our annual service quality performance under this program the Company will continue to use its system-wide results. We will, however, separately track and report the results for this measure for our Washington customers only. For 2017, the percent of Washington customers satisfied or very satisfied with the Company's customer service representatives and contact center was 93%.

Customer Satisfaction with Avista's Field Service Representatives

As part of Avista's Service Quality Measures program, the level of our customers' satisfaction with the Company's field services will meet or exceed a benchmark of 90%.[16]

The quality of our field services and the satisfaction of our customers is influenced by several factors. Each year we measure the importance of these factors to our customers and their satisfaction with each aspect of our service. These factors, including our customers' level of satisfaction (either satisfied or very satisfied) with each factor in 2016, are listed below.

- ✓ The service representative keeping you informed of the status of your job. **(90%)**
- ✓ The service representative or service crew being courteous and respectful. **(99%)**
- ✓ The service representative or service crew being informed and knowledgeable. **(99%)**
- ✓ The service representative or service crew leaving your property in the condition they found it. **(98%)**
- ✓ The service work being completed according to the customer's expectations. **(99%)**
- ✓ The overall quality of the work performed by Avista Utilities. **(97%)**

2017 Results – The annual survey results for this measure, as reported in the table below, show that 95.2% percent of our customers were satisfied with the service provided by Avista's field service representatives. Overall, 82.6% of our customers were "very satisfied" and 12.1% were "satisfied" with the quality of our field services.

[16] The level of Customer satisfaction with the Company's field services will be at least 90 percent, where:

a. The measure of Customer satisfaction is based on Customers who respond to Avista's quarterly survey of Customer satisfaction, known as the Voice of the Customer, as conducted by its independent survey contractor;
b. The measure of satisfaction is based on Customers participating in the survey who report the level of their satisfaction as either "satisfied" or "very satisfied"; and
c. The measure of satisfaction is based on the statistically-significant survey results for both electric and natural gas service for Avista's entire service territory for the calendar year, and if possible, will also be reported for Washington customers only.

Table 7. Customer Satisfaction with Avista's Field Services Representatives in 2017.

Customer Satisfaction with Avista's Field Services Representatives	Service Quality	2016 Performance	Achieved
Percent of customers either satisfied or very satisfied with the Quality of Avista's Field Service Representatives	90% or Greater Satisfied	95.2%	✓

Prior to the development of the service quality measures program, Avista did not separately track or report results for any of our state jurisdictions, and for reporting our annual service quality performance under this program the Company will continue to use its system-wide results. We will, however, separately track and report the results for this measure for our Washington customers. For 2017, the percent of Washington customers satisfied or very satisfied with the Company's field service representatives was 95.5%.

Customer Complaints made to the Commission

As part of Avista's Service Quality Measures program, the number of complaints filed by our customers with the Commission will not exceed a ratio of 0.4 complaints per 1,000 customers.[17]

When our customers are unhappy with any aspect of the service they receive from Avista, and the Company is made aware of the issue, our intent is work with the customer to quickly and fairly resolve the issue to their satisfaction. Though we are successful in resolving the majority of these customer issues, there are some that cannot be favorably resolved and result in the customer filing a formal complaint with the Commission. In addition to complaints arising in this manner, there are also instances where a customer files a complaint without having first notified the Company of their issue or concern. While past experience has shown that the Commission ultimately finds in the great majority of these complaints that the Company has acted properly, Avista agrees that the number of complaints filed does provide one indicator of the level of dissatisfaction our customers may have with our service.

2017 Results – Our Washington customers filed a total of 67 complaints with the Commission in 2017, a decrease of 36 complaints from 2016. The predominant areas of concern related to credit and collections and billing matters, just as in years past. Avista's customer count as defined for this measure was 423,688. The resulting fraction of complaints (67 ÷ 423,688) was 0.0001581, and the number of complaints per 1,000 customers (0.0002475 × 1,000) was 0.16 (rounded up), as noted in the table below.

Table 8. Percent of Avista's Customers Who Filed a Complaint with the Commission in 2017.

Percent of Avista's Customers Who Filed a Commission Complaint	Service Quality	2016 Performance	Achieved
Number of Avista's customers who file a complaint with the Commission (number of complaints per 1,000 customers)	Ratio of 0.4 or Lower	0.16	✓

[17] The ratio is calculated by dividing the sum of all electric and natural gas customer complaints filed with the Commission by the average monthly number of Avista customers for the year. The rate is calculated by multiplying the percentage by 1,000.

Answering Our Customers' Calls Promptly

As part of Avista's Service Quality Measures program, the percentage of customer calls answered live by a customer service representative within 60 seconds will average 80% or greater.[18]

This particular customer service measure is one of the subset of service attributes that contribute to the customer's overall satisfaction with our service representatives and contact center. Often referred to as the "grade of service," this measure is the average percentage of customer calls to our contact center that are answered live by a customer service representative within 60 seconds for those customers who wish to speak with a service representative. When a customer calls Avista's contact center their call is initially received by our automated (voice activated) phone system. The customer is presented the option of using the phone system for self-service (e.g. to check their account balance or pay their bill, etc.) or to speak with a customer service representative live to meet their service need. Avista's response time in answering the customer's call is the time that elapses between the customer's request to speak to a representative and when their call is answered live by a representative.

For many years Avista has maintained a service benchmark of 80% or greater, even though some utilities and businesses have established a higher "grade of service" (e.g. 90% or a goal of answering calls within 30 seconds). Because it requires an increased level of staffing and cost to customers to achieve a higher service level, Avista has focused on lower cost/no cost measures, such as effective employee training and coaching to achieve superior standards for attributes such as courtesy, caring, knowledge, and proficiency, to maintain our very-high level of overall customer satisfaction with our service representatives and contact center.

In addition to responding to customers effectively, Avista has implemented measures to help reduce the overall volume of customer calls, which helps reduce the cost of service paid by our customers. These efforts include providing customers a way to communicate with the Company using their preferred "channel" of communication, such as e-mail,

[18] The percentage of Customer calls answered by a live representative within 60 seconds will average at least 80 percent for the calendar year, where:

a. The measure of response time is based on results from the Company's Contact Center, and is initiated when the Customer requests to speak to a Customer service representative; and
b. Response time is based on the combined results for both electric and natural gas Customers for Avista's entire service territory.

customer web, or the automated phone system. In addition to providing for numerous communication channels, the Company has focused on enhancing customer self-service options as discussed above. These efforts not only help reduce the volume of calls to our contact center and maintain a high level of service at lower cost, but also improves customer experience and satisfaction.

2017 Results – Our Washington customers made a total of 737,993 qualifying calls to Avista that were answered live by a customer service representative in 2017. Of these calls, 601,236 were answered live in 60 seconds or less, for a score of 81.5%, as shown in the table below.

Table 9. Percent of Avista's Customer Calls Answered Live within 60 Seconds in 2017.

Percent of Avista's Customer Calls Answered Live Within 60 Seconds	Service Quality	2016 Performance	Achieved
Percent of Avista's customer calls answered live by a customer service representative within 60 seconds	80% or Greater	81.5%	✓

Avista's Response Time for Electric Emergencies

As part of Avista's Service Quality Measures program, the average response time to an electric system emergency will not exceed 80 minutes for the year.[19]

When our customers call Avista to report an electric emergency we work with the customer to quickly ascertain the particular circumstances being reported, and instruct the customer on how best to ensure the safety of themselves and that of others until help arrives. We immediately begin the dispatch of service personnel best situated to respond in the shortest time possible. Once at the scene Avista's first priority is to make the situation safe for our customers, citizens, other emergency responders, and our employees. Restoration of the problem can begin once the safety of the site is secured and needed resources arrive at the scene. The Company's ability to respond quickly to an electrical emergency is influenced by many factors, some of which include the urban or rural locale, the location of the nearest available respondent (especially in rural areas), the time of day, season of the year, weather conditions, traffic, and the presence of other simultaneous emergency events across the system. For this measure, the response time to an electric emergency is the elapsed time between the confirmation of the emergency with the customer (when the dispatch field order is given) and when the Avista service person arrives at the scene.

2017 Results – The average response time for the year is calculated by dividing the sum of all applicable electric emergency response times by the total number of qualifying electric emergency incidents. Avista received 483 qualifying emergency reports in 2017, which had a cumulative response time of 19,272 minutes. The average response time for the year is calculated by dividing the cumulative response time by the total number of responses. The resulting average for 2017 was 39.9 minutes as noted in the table below.

[19] The Company's average response time to an electric system emergency in Washington will not exceed 80 minutes for the calendar year, where:

a. Response time is measured from the time of the Customer call to the arrival of a field service technician;
b. "Electric system emergency" is defined as an event when police / fire services are standing by, or arcing/flashing wires down (unspecified location, pole to house, or pole to pole), or for feeder lockout; and
c. Response times are excluded from the calculation for those periods of time when the Company is experiencing an outage that qualifies as a "Major Event Day" (or "MED"), as defined by the Institute of Electrical and Electronics Engineers, and which includes the 24 hour period following the Major Event Day.

Table 10. Avista's Response Time for Electric Emergencies in 2017.

Avista's Response Time for Electric Emergencies	Service Quality	2017 Performance	Achieved
Average time from customer call to the arrival of Avista's field technicians in response to electric system emergencies	80 Minutes or Less	39.9 Minutes	✓

Avista's Response Time for Natural Gas Emergencies

As part of Avista's Service Quality Measures program, the average response time to a natural gas system emergency will not exceed 55 minutes for the year.[20]

When our customers call Avista to report a natural gas emergency, we work with the customer to quickly ascertain whether the presence of natural gas (odor) is likely coming from inside the customer's home or business or from facilities located outside. If inside, the customer is instructed to immediately evacuate the building to a safe distance and await the arrival of emergency responders. If the leak is in facilities outside, instructions to the customer are based on the proximity and type of the leak to their (or others') home or business. Once the nature of the leak has been determined and the customer has been given precautionary instructions on how best to ensure their own safety and that of others until help arrives, we immediately begin the dispatch of service personnel best situated to respond at the scene in the shortest time possible. At the scene Avista's first priority is to make the situation safe for our customers, citizens, other emergency responders, and our employees. Restoration of the problem can begin once the safety of the site is secured and needed resources arrive at the scene.

The Company's ability to respond quickly to a natural gas emergency is influenced by many factors, some of which include the urban or rural locale, the location of the nearest available respondent (especially in rural areas), the time of day, season of the year, weather conditions, traffic, and the presence of other simultaneous emergency events across the system. Natural gas emergencies differ from electric emergencies, however, in that the risk of a potential consequence to a gas leak can increase with the passage of time as leaking natural gas may accumulate at the site. For this reason Avista's work practices and staffing levels aim to provide an average response time of 55 minutes or less. For this measure, the response time to a natural gas emergency is the elapsed time between the confirmation of the emergency with the customer (when the dispatch field order is given) and when the Avista service person arrives at the scene.

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[20] The Company's average response time to a natural gas system emergency in Washington will not exceed 55 minutes for the calendar year, where:

a. Response time is measured from the time of the customer call to the arrival of a field service technician; and
b. "Natural gas system emergency" is defined as an event when there is a natural gas explosion or fire, fire in the vicinity of natural gas facilities, police or fire are standing by, leaks identified in the field as "Grade 1", high or low gas pressure problems identified by alarms or customer calls, natural gas system emergency alarms, carbon monoxide calls, natural gas odor calls, runaway furnace calls, or delayed ignition calls.

2017 Results – The average response time for the year is calculated by dividing the sum of all applicable natural gas emergency response times by the total number of qualifying emergency incidents. Avista received 3,882 qualifying emergency reports in its Washington service area in 2016, which had a cumulative response time of 195,229 minutes. The average response time for the year is calculated by dividing the cumulative response time by the total number of responses. The resulting average for 2016 was 50.29 minutes as noted in the table below.

Table 11. Avista's Response Time for Natural Gas Emergencies in 2017.

Avista's Response Time for Natural Gas Emergencies	Service Quality	2017 Performance	Achieved
Average time from customer call to the arrival of Avista's field technicians in response to natural gas system emergencies	55 Minutes or Less	50.29 Minutes	✓

Electric System Reliability

Providing safe and highly-reliable electric service for our customers at a reasonable cost is fundamental to our business. We believe our current level of reliability is reasonable, acceptable and cost effective for our customers, and our long-term objective is to generally uphold our current levels of electric system reliability. Achieving this requires an ongoing effort to balance the many investment and other priority needs across our system for today and with implications that project far into the future. As already explained, we monitor and track various aspects of the reliability performance of our system each year relying on industry-standard measures[21] (or indices). Two of the most-commonly reported measures are very-briefly described below, and are discussed in greater detail in section three of this report and in Appendix A. For its service quality measures program Avista reports its annual reliability results in the context of its historic five-year rolling average for these two measures.

- ✓ **Number of Outages** – known technically as the System Average Interruption Frequency Index or "SAIFI," is the average number of sustained interruptions (outages) per customer for the year.
- ✓ **Outage Duration** – known technically as the System Average Interruption Duration Index or "SAIDI," is the average duration of sustained interruptions (outages) per customer for the year.

As explained in the next section of this report on the Company's Electric System Reliability Results for 2017, many factors influence the number and duration of outages on any electric system. Some of these include the average age of the system, its engineering design, construction standards, general condition, the extent of the system that is rural, terrain, utility equipment and staffing levels, and its day-to-day operation. The type and proximity of surrounding vegetation and local and regional weather patterns, including variability in weather, can have a pronounced impact on system reliability. Because the frequency and duration of the electric system outages that result from these factors can vary substantially from year to year, there is, naturally, a lot of variability in the annual measures of system reliability over time.

For Avista, weather-related outages tend to have a predominant impact on the reliability of our system. This is because individual weather events often impact large portions of our

[21] See Appendix B for definitions and index calculations.

system and can result in damage to many types of facilities. Weather caused outages, particularly from high winds, ice, and snow can also require substantial effort and time to restore. These storm events can result in many customers without service for an extended period of time.

Because the impact of weather events on system reliability is common to all electric systems, the industry has adopted standardized adjustments that remove outages related to weather events of a certain magnitude from the calculation of results for outage frequency and duration. This threshold level of severity is referred to as a Major Event Day or ("MED"). The outages caused by any storm event that qualifies as a major event day are removed from the data used to calculate the utility's annual reliability results. For Avista, the impact of these major storm events is clearly evident in the substantial system outages caused by windstorms in the late summer of 2014, and the very significant wind storm event of November 2015. By contrast, in 2016, the Company did not experience any storm events that constituted major event days, and we experienced a fairly-limited number of major events in 2017 (for illustration, please see Figures 5 and 6 in this report). Although the year-to-year variability in outage duration is substantially reduced by the adjustment for major events, there can still be a substantial weather impact on the reliability results we report each year. This is the result of storms that, while not qualifying as major events, still result in substantial system outages.

The important point of this discussion is that the reliability results for any single year, considered in isolation, do not provide a meaningful measure of the overall reliability of the utility's system, or an assessment of whether the performance that year was "acceptable" or "unacceptable." The reliability performance of our system (or any utility system) should be evaluated over the long term as the basis for evaluating whether our reliability is trending stably, improving, or degrading.[22] Avista has agreed to report its annual reliability results to its customers in the context of its historic five-year rolling average. This approach helps our customers better understand how each year's reliability results fit into our long-term trend in overall system reliability.

[22] This is similar to the approach now used by the California Public Utilities Commission to evaluate electric utilities' system reliability. In: Approaches to Setting Electric Distribution Reliability Standards and Outcomes, pages 130 - 136. The Brattle Group, Ltd. 2012.

Number of Electric System Outages

As part of Avista's Service Quality Measures program, the Company will report its annual electric system reliability measure for the number of non-major storm power outages experienced per customer for the year (SAIFI).[23]

2017 Results – This measure, as noted earlier, represents how often on average an Avista electric customer experienced a sustained[24] service outage during the year. This measure is calculated by summing the total number of customer outages recorded for the year, divided by the total number of customers served by the Company in that year. The 2017 result of 1.2 is above the average value for the previous five-year period (2012-2016) of 1.04, and for the current five-year period of 1.05. For 2017, our Washington-only result was 0.98, which was slightly better than our previous and current five-year 'system' averages of 1.04 and 1.05, respectively.

Table 12. Number of Electric System Outages for the Average Avista Customer in 2017.

Number of Electric System Outages for the Average Avista Customer	2017 System Results	Current 5 Year Average (2013-2017)	Change in 5 Year Average
Number of sustained interruptions in electric service for the average Avista customer for the year (SAIFI)	1.2	1.05	+0.01

The figure below shows the rolling five-year average value for SAIFI for each five-year period from 2005 through 2017. Over this period, the general patterns shows a slight improvement in system reliability, though the overall trend is fairly stable.

[23] The Company will report the frequency of electric system interruptions per Customer for the calendar year, where:

a.

b. The interruptions are measured as the System Average Interruption Frequency Index ("SAIFI"), as calculated by the IEEE;

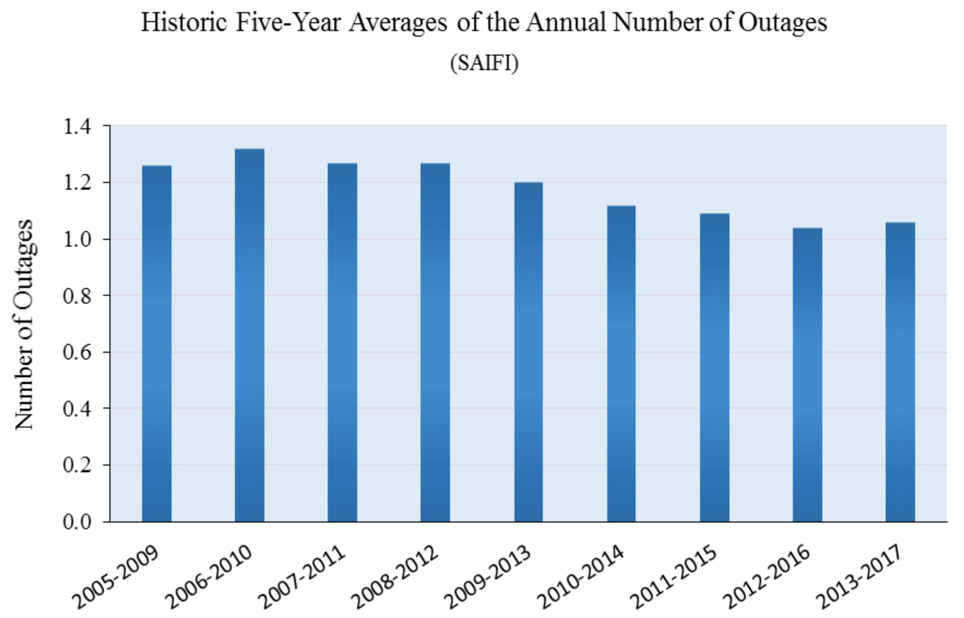
c. The calculation of SAIFI excludes interruptions associated with any MED;

d. The report will provide a brief description of the predominant factors influencing the current-year results, and in the context of the Company's historic five-year rolling average of SAIFI; and

e. The results will be reported on a system basis for Washington and Idaho and will include the annual SAIFI for Washington only.

[24] Any service interruption that is greater than five minutes in duration.

Figure 8. Historic Five-Year Rolling Average for Number of Outages (SAIFI) on Avista's System.



Average Duration of Electric System Outages

As part of Avista's Service Quality Measures program, the Company will report its annual electric system reliability measure for the total duration of non-major storm power outages experienced per customer for the year (SAIDI).[25]

2017 Results – This measure, as noted earlier, represents the average duration or length of outages for the year. Outage duration (SAIDI) is calculated by summing all of the customer outage time occurring in the year, divided by the total number of customers served by the utility in that year. The 2017 value for outage duration of 183 minutes was substantially greater than the average value for the previous five-year period (2012-2016) of 142 minutes. This 2017 result increased the average value for the current five-year period (2013-2017) by nine minutes, to 151 minutes as shown below in Table 13. For 2015 the Washington only value was 136 minutes, which was substantially better than our combined system result of 183 minutes.

Table 13. Outage Duration for the Average Avista Customer in 2017.

Total Outage Duration for the Average Avista Customer	2017 System Results	Current 5 Year Average (2013-2017)	Change in 5 Year Average
Total duration of all electric service outages for the average Avista customer for the year (SAIDI)	183 Minutes	151 Minutes	9 Minutes

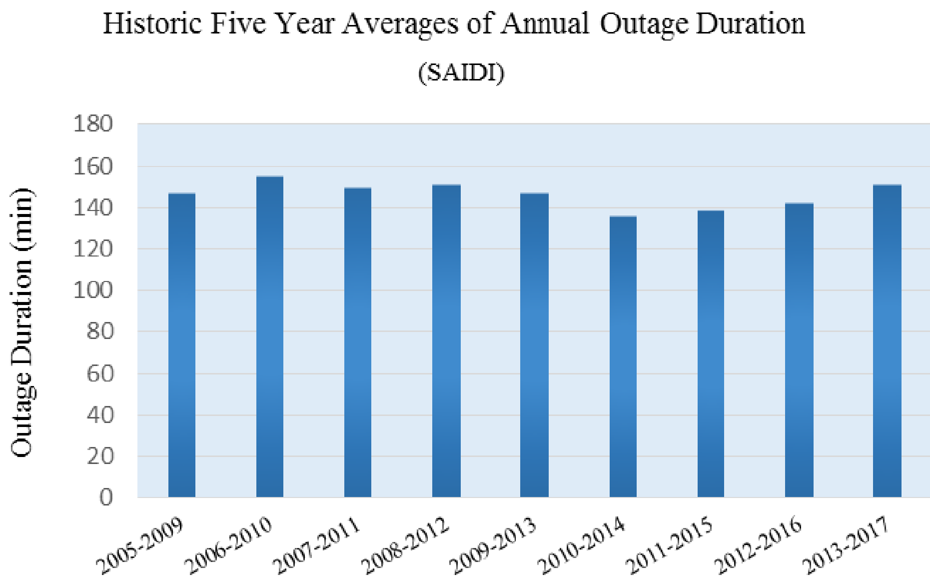
The figure below shows the rolling five-year average value for Avista's outage duration for each five-year period from 2005 through 2017. Over this period, the trend shows a slight increase in the average outage duration during the early years, with a decline in the midrange, followed by a slight increasing trend in more-recent times, though the overall

[25] The Company will report the duration of electric system interruptions per Customer for the calendar year, where:

a. The interruption duration is measured as the System Average Interruption Duration Index ("SAIDI"), as defined by the IEEE;
b. The calculation of SAIDI excludes interruptions associated with any MED;
c. The report will provide a brief description of the predominant factors influencing the current-year system results, and in the context of the Company's historic five-year rolling average of SAIDI; and
d. The results will be reported on a system basis for Washington and Idaho and will include the annual SAIDI for Washington only.

trend is relatively stable. Understanding the reasons behind this increasing trend in recent years is a topic of interest to the Company, and is briefly discussed later in this report.

Figure 9. Historic Five-Year Rolling Average of Duration of Outages (SAIDI) on Avista's System.



Customer Service Guarantees

Our service quality measures program includes seven types of service for which Avista provides "customer service guarantees." Our service commitments under these guarantees recognize the customer inconvenience that may result when our delivered service does not meet our stated goal. In such cases we will provide our customers a bill credit or payment in the amount of $50 in recognition of that inconvenience. All costs associated with the payment of customer service guarantees are paid by the Avista's shareholders, and are not paid by our customers, or included in the rates they pay for service.

Following the approval of the Company's program on March 29, 2015, the Company spent the remainder of 2015 setting up the processes required to implement, track, and monitor each of the seven guarantees in order to begin offering the guarantees on January 1, 2016.

> The Company is pleased to report that in the second year of this program we met 99.78% of our applicable service commitments, providing our customers a guarantee credit in just 150 out of 65,673cases.

Keeping Our Electric and Natural Gas Service Appointments

The Company will keep mutually agreed upon appointments for electric or natural gas service, scheduled in the time windows of either 8:00 a.m. – 12:00 p.m. or 12:00 p.m. – 5:00 p.m.[26]

Avista provides its customers with appointments for certain types of electric and natural gas service requests. For electric service, the Company will schedule appointments for service drops or disconnects. For all other electric service work, the customer does not need to be present for the Company to perform the required work (i.e., check meter, meter test, voltage check…). For natural gas service, the Company provides appointments for dealer-requested service, meter exchange and tests, meter unlock, no heat inspections, reconnects, relighting of Avista repairs, and repeated pilot light outages on natural gas

[26] Except in the following instances:
a. When the Customer or Applicant cancels the appointment;
b. The Customer or Applicant fails to keep the appointment; or
c. The Company reschedules the appointment with at least 24 hours notice.

appliances. The Company offers more types of natural gas service appointments (than electric service) because the customer must be present for our employees to complete the work as they must enter the customer's home. If the requested date and/or time of the service request is unavailable, the Company will still accommodate the customer's request, but will not commit to a specific time that an employee will arrive to work on the service request. Often times this practice results in better customer satisfaction as the Company makes every effort to accommodate a customer's request on that day, rather than schedule the work on a future date. Finally, new service connects and credit reconnects are not available for appointments as the work orders are completed the same day of the request.

2017 Results – In 2017, the Company successfully kept 99.3% of its scheduled customer appointments (1,595) for applicable electric and natural gas service, and paid a guarantee credit in just 11 instances for the year. The primary reason for the missed appointments is emergency work orders that arise during the day and which prevent the Company from meeting its scheduled appointment time. Due to the risks and danger of electric and natural gas emergencies, the Company prioritizes emergency orders over all service work. The result of this necessary prioritization is that the Company will occasionally miss a few appointments, as reflected in the 2017 results.

Table 14. Avista Service Appointment Results for 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Keeping Our Electric and Natural Gas Service Appointments scheduled with our customers	1,595	11	**$550**

Prompt Restoration of Electric System Outage

When our Customers experience an electric interruption, the Company will restore the service within 24 hours of notification from the Customer.[27]

The Company strives to restore power to its customers as quickly as possible, while maintaining the safety of our employees, customers, and the public as our top priority. Electric system outages can be complex and occur all hours of the day and night, and all days of the year. In many years, even in cases where Avista does not experience any storms that qualify as major events, it may still be impossible for us to restore service to all our customers within 24 hours. In other years, by contrast, such as in 2016, we are able to successfully restore service to all of our customers who experienced an outage within this benchmark of 24 hours. In 2017, though we provided customers a guarantee credit in 23

[27] Except for the following instances:

a. During periods of time when the outage is associated with a MED, which includes the 24-hour period following the MED; or
b. When an action or default by someone other than a utility employee that is outside the control of the company prevented the Company from restoring supply.

instances, we were able to successfully restore service to our customers within the benchmark 99.93% of the time.

2017 Results – In 2017, the Company's Washington customers experienced 30,692 outage events in which all but 23 had their power restored within 24 hours.

Table 15. Avista's Outage Restoration Results for 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Restore service within 24 hours of a customer reporting an outage (excluding major storm events)	30,669	23	**$1,150**

Promptly Switching on Electric Service When Requested

The Company will switch on power within one business day of the Customer or Applicant's request for service.[28]

When customers sign up for service they have a reasonable expectation their service will be turned on as quickly as possible, or promptly on a future date they request. The Company strives to meet these customer requests by all reasonable means. Typically, for electric service the meter is not shut off between customers, so when a customer moves to a new location the service is already on when they open an account for service at the location. In situations where the service is not already on at a customer location the Company must send an employee to reconnect the meter at the location. With our pending deployment of advanced metering in our Washington service area, Avista will be able to in the future remotely connect a customer's electric service within minutes of their request.

2017 Results – Avista met its benchmark to turn on our customers' service in one business day in each of the 9,557 requests we received in 2017, for a success rate of 100%.

Table 16. Avista's Switching on Power within One Business Day for 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Turn on power within a business day of receiving the request	9,557	0	**$0**

[28] Except for the following instances:

a. When construction is required before the service can be energized;
b. When the Customer does not provide evidence that all required government inspections have been satisfied;
c. When required payments to the Company have not been received; or
d. The service has been disconnected for nonpayment or theft/diversion of service.

Promptly Providing Cost Estimates to Customers for New Service

> *The Company will provide a cost estimate to the Customer or Applicant for new electric or natural gas supply within 10 business days upon receipt of all the necessary information from the Customer or Applicant.*

When constructing a new home the process for providing new electric or natural gas supply can be complex, and may involve a customer, contractor, electrician, or dealer depending on the nature of the new service. A request for new electric or natural gas service is typically routed through our customer contact center and is assigned to one of our employee Customer Project Coordinators (CPC) in our natural gas and electric construction areas. Our customer project coordinators are responsible for discussing the request with the customer (applicant), meeting with the customer at the location, designing the service, and then providing the customer a cost estimate for the required construction. The Company's goal for completing the cost estimate, and for which it offers a customer service guarantee, is 10 business days.

2017 Results – The Company received 3,929 requests for new electric or natural gas service in 2017 and we successfully provided cost estimates for each within 10 business days of the request, for a success rate of 100%.

Table 17. Avista's Results for Providing Customers a Cost Estimate for New Service in 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Provide a cost estimate for new electric or natural gas service within 10 business days of receiving the request	5,024	0	**$0**

Promptly Responding to Customers' Bill Inquiries

> *The Company will respond to most billing inquiries at the time of the initial contact, and for those inquires that require further investigation, the company will investigate and respond to the Customer within 10 business days.*

For a customer, it can be difficult to understand why the amount of their energy bill can vary sometimes substantially from month to month. Some of these factors include variability in weather, changes in rates, the result of an estimated bill amount in certain circumstances, and variation in the number of billing days included in the billing period. When customers have questions about their bill, Avista's contact center representatives strive to address and resolve all inquiries on the initial customer contact. Some of the tools our employees have to address these bill inquires (which are generally related to circumstances when customers feel their bill is too high), include:

- ✓ Review the meter read and usage history to see if the bill is in line with the prior months or years;
- ✓ Review the number of billing days for the bill in question compared with the norm;
- ✓ Utilize the Company's bill analyzer tool, which is also available to customers on Avista's website, for a comparison of weather, average usage, and rates;
- ✓ Discuss with the customer any life changes, new appliances, or maintenance needs and how those can impact their utility bill;
- ✓ Offer tips on ways to save energy;
- ✓ Direct the customer to Avista's website for additional energy savings advice; and,
- ✓ Offer to mail Energy Use and Savings Guides or Energy Savings kits.

When the contact center representative is unable to address the billing inquiry on initial contact or the customer is not satisfied with the information provided on their inquiry, the Company will then open a case to further investigate the customer's inquiry. After a case has been created Avista will verify the meter read or obtain a new meter read to double-check the accuracy of the metered use. If there was a billing error the customer representative will initiate sending a corrected bill. After determining the accuracy of the bill, the customer service representative will then discuss the inquiry again with the customer along with the results of the verification of the meter read or new meter read. Typically, after this process our customer is satisfied with the resolution. In situations where the customer is not satisfied and/or requests a meter test to ensure their meter is reading accurately, it triggers a separate process, which is covered by customer service guarantee number six, Promptly Responding to Customer's Requests for Meter Testing.

2017 Results – The Company successfully investigated and responded to all billing inquires, which were not resolved upon the initial customer contact, within 10 business days in 2017, for a success rate for 100%. The number of these follow-up billing inquiries was 1,623.

Table 18. Avista's Results for Responding to Customer's Bill Inquiries in 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Investigate and respond to a billing inquiry within 10 business days if unable to answer a question on first contact	1,623	0	**$0**

Promptly Responding to Customers' Requests for Meter Testing

The Company will investigate Customer-reported problems with a meter, or conduct a meter test, and report the results to the Customer within 20 business days.

Commission rules govern the utility's requirement for meter testing,[29] and Avista has naturally complied with these requirements prior to the implementation of its customer service guarantee program. Under the guarantees now in place the Company will provide a $50 credit if it fails to meet this requirement.

2017 Results – In 2017, 1,083 of our customers reported a meter problem or requested the Company conduct a meter test. Avista successfully tested and reported the results to all but one of these customers within 20 business days, for a success rate of 99.99%.

Table 19. Avista's Results for Responding to Customers' Requests for Meter Testing in 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Investigate a reported meter problem or conduct a meter test and report the results within 20 business days	1,082	1	**$50**

Providing Customers Advance Notice of Scheduled Electric Interruptions

The Company will provide notification to the Customer, through means normally used by the Company, at least 24 hours in advance of disconnecting service for scheduled interruptions.[30]

Commission rules[31] require the utility to notify customers when it plans to disconnect service on a planned basis, and Avista has naturally complied with this requirement before its customer service guarantees program. Today, the Company will provide a $50 credit for each customer if it fails to provide the required notification. Complying with this rule has always been a complex process because there are so many areas within the Company involved in the effort. Some of these include natural gas construction, electric operations, customer project coordinators, asset maintenance program managers, distribution dispatch,

[29] WAC 480-100-183 and 480-90-183 state that an electric or gas "utility must test and report to the customer the accuracy of a meter within twenty business days after receiving an initial request from a customer."

[30] Except for the following instances:

a. When the interruption is a momentary interruption of less than five minutes in duration;
b. When the safety of the public or Company personnel or the imminent failure of Company equipment is a factor leading to the interruption; or
c. The interruption was due to work on a meter.

[31] WAC 480-100-148 requires electric utilities to provide "all customers affected by a scheduled interruption associated with facilities other than meters…notification…at least one day in advance."

service dispatch, and the customer contact center. This complexity requires us to maintain multiple checkpoints in our business processes to ensure all customers affected by a scheduled interruption are notified in advance.

2017 Results – A total of 17,194 customers were affected by scheduled service interruptions in 2017. Of that total, Avista successfully notified 17,079 customers for a success rate of 99.3%. For the 115 customers who we did not provide our required advance notification, the Company provided a $50 credit, for a total payment of $5,750 in credits.

Table 20. Avista's Customers Notified in Advance of a Service Interruption in 2017.

Customer Service Guarantee	Successful	Missed	$ Paid
Notify customers at least 24 hours in advance of a planned power outage lasting longer than 5 minutes	17,079	115	**$5,750**

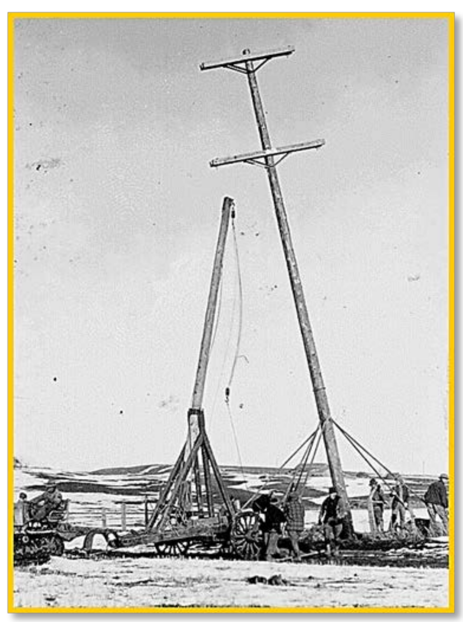
Avista's Electric System Reliability Report for 2017

Introduction

Providing Our Customers Reliable Electric Service

Avista is focused on maintaining a high degree of reliability as an important aspect of the quality of our service, particularly as our society becomes ever more reliant upon electronic technologies. The Company's objective has been to generally uphold our current level of reliability, which we believe has been acceptable to our customers. Providing a level of system reliability that is adequate for our customers represents a complex balance of customer expectations, cost, and performance. Because it is expensive to achieve every new increment of system reliability, and because these investments must be sustained over a period of many years before the benefit is realized, it is important to ensure that we are investing only the amount of money it takes to achieve an acceptable level of performance. Avista believes the current reliability performance of our system effectively achieves this balance, and because of this, it represents a cost-effective value for our customers. This assessment is evidenced by our high level of customer satisfaction with their overall service from Avista (which includes aspects such as electric reliability), our customers' satisfaction with their power quality and reliability,[32] by the low number of complaints we receive each year that are related to reliability issues, and by our performance being in a reasonable range for the electric utility industry.

Prudent Investment – With each investment, Avista demonstrates that the overall need, evaluations of alternatives, and the planned timing of implementation is judicious and in our customers' best interest. Avista believes its Electric Distribution Infrastructure Plan report for 2017 demonstrates that our recent past, current, and planned investments in electric distribution infrastructure are necessary and prudent, and it explains why the failure to make these investments would impair the performance of our system and harm our ability to deliver safe and reliable service to our customers. In that report we explain that the investments we make to uphold the current reliability of our electric



[32] As measured in the annual customer satisfaction survey conducted by J.D. Power.

distribution system are conservative, thoroughly evaluated, and cost effective for our customers. We believe the report demonstrates that our distribution investments are needed and necessary in the timeframes planned in order to prudently conduct our business.

Managing Our Costs – With the increasing levels of distribution and other plant investments made by the Company in recent years, we have worked to mitigate the cost impact by moving to our present level of investment in electric distribution infrastructure more gradually over a period of several years. This effort often requires Avista to fund programs at less than an optimum level in an effort to balance the many competing infrastructure needs we currently face. The Company's efforts to manage the impact of these increasing infrastructure needs, as well as all other normal increases in expenses, has allowed us to hold the annual increases in our customers' electric bill to a reasonable average of 1.9% over the past eight years, keeping Avista's electric bills below the national average, below the average for Idaho (since 2013), and somewhat below the average for electric customers in the state of Washington.[33]

Purpose of this Report

Each year Avista is required to submit to the Commission a report on its electric system reliability performance for the prior calendar year.[34] This report describes results of the Company's annual monitoring of several key reliability metrics (or measures, or indices).

These indices are industry standard measures developed by the Institute of Electrical and Electronics Engineers (IEEE), and which are important in promoting standardized reporting across the utility industry. These measures and their associated technical nomenclature can be somewhat confusing to the reader so for the purposes of this report, Avista uses more generic names for each of these technical outage indices. Listed below in bold font is the generic name we use to describe each reliability measure or index, followed by the technical name and definition of each. A more detailed description of each of these reliability statistics and the methods of their calculation are discussed in detail in Appendix B of this report.

[33] See Appendix A: Avista Customer Costs for a statewide and national customer cost comparison.
[34] Pursuant to WAC 480-100-398.

Number of Outages – This simplified term represents the IEEE index, known as the System Average Interruption Frequency Index, commonly represented by the acronym "**SAIFI**," which is the average number of sustained interruptions (outages) that a customer would experience in a year. "Sustained" outages are defined and those with a duration or length of greater than five minutes. SAIFI is calculated by summing the total number of customer outages recorded for the year, divided by the total number of customers served by the Company in that year.

Number of Brief Outages – This simplified term represents the IEEE index known technically as the Momentary Average Interruption Event Frequency Index, commonly represented by the acronym "**MAIFI**," which is the average number of momentary interruptions (outages) per customer for the year. MAIFI is calculated by summing the total number of brief customer outages recorded for the year, divided by the total number of customers served by the Company in that year.

Outage Duration – This simplified term represents the IEEE index known as the System Average Interruption Duration Index, commonly represented by the acronym "**SAIDI**," which is the average duration or length of sustained interruptions (outages) per customer for the year. SAIDI is calculated by summing all of the customer outage time occurring in the year, divided by the total number of customers served by the utility in that year.

Restoration Time – This simplified term represents the IEEE index known as the Customer Average Interruption Duration Index, commonly represented by the acronym "**CAIDI**," which is the average duration or length of sustained interruptions (outages) per customer for the year. Different from the System Average Indices above, restoration time is calculated only for those customers who actually experience an outage during the year. This index is calculated by summing all of the customer outage time occurring in the year, divided by the total number of customers served by the utility in that year. In addition to these four reliability indices, Avista also tracks the following additional measures:

Multiple Outages – known technically as Customers Experiencing Multiple Sustained Interruptions, commonly represented by the acronym "**CEMI**," is the number of customers who experience greater than an identified or set number of interruptions (outages) during the year.[35]

[35] Though not presented in this report for 2017, Avista also monitors another reliability metric referred to as "Multiple Sustained and Brief Outages." Known technically as Customers Experiencing Multiple Sustained

The Company is also required to report on any changes it has made in the prior year in the manner of collecting reliability data or in calculating values for each reliability index. A brief record of such changes the Company has made historically is provided in Appendix C of this report. As part of this reporting, Avista must also compare its annual reliability performance to a set of baseline reliability statistics, which were established in 2005.[36] The Company's performance for each year since 2005 is presented in each annual report. All of the data included in this report is based on "system data," this is, representing our entire electric service territory in Washington and Idaho.

In addition to reporting annual results for each index, Avista sometimes calculates a statistical range for each based on two standard deviations of the average value for a given period of time. Statistically, this range represents the probability that results for the current year will fall within the range 95% of the time. Annual results will exceed this range in years when weather and storm conditions vary substantially from the normal pattern of variation. In prior years, Avista has referred to this range as a "target," however, this is a misnomer. This range should not be interpreted as a "level of performance" to be achieved, because two-thirds of the factors that determine annual reliability performance are random in nature and are beyond the control of the Company. Rather, this statistical range simply represents the span of variability that is expected to encompass the results for each reliability statistic in most years.

Overview of Avista's Electric Distribution System

Avista's electric system consists of an interconnected network of generating stations, transmission lines, transmission and distribution substations, and the distribution lines that carry energy to our customers. Every element of this electricity supply system is managed to provide a very high level of service reliability. If the Company loses the availability of a generating station it can instantly rely on the resiliency of the transmission grid and its available reserves and market purchases to maintain supply. In the event of a transmission line outage, the Company can most often reconfigure the power flow on its transmission grid through other networked lines to 'bypass' the line outage and prevent our customers from experiencing an interruption in their service. Because customer outages resulting from interruptions in generation and transmission infrastructure are very rare, our primary reliability focus for this report is on our electric distribution system, including a focus on our distribution substations.

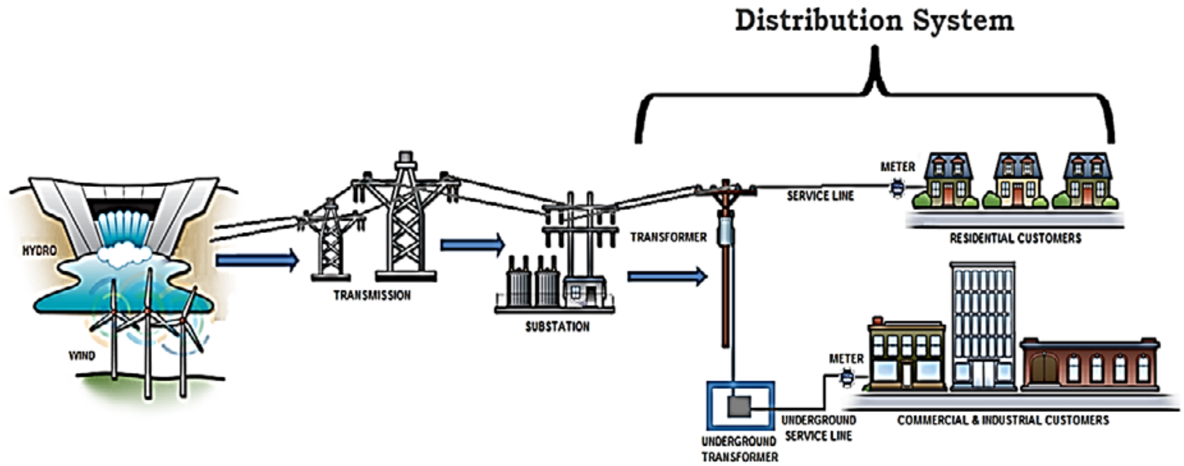
AVISTA'S DISTRIBUTION SYSTEM	
Electric Substations	133
Overhead Lines	7,685 Miles
Underground Electric Cables	4,277 Miles
Service Lines	6,970 Miles

Interruptions and Momentary Interruption Events or "CEMSMI," this is the number of customers experiencing multiple sustained interruptions (outages) and momentary interruptions (brief outages).

[36] WAC 480-100-393(3)(b).

Avista's system includes 19,000 miles of distribution lines, including both overhead wire and underground cable systems, interconnected with 133 distribution substations[37] in the portion of our system depicted in the illustration below.

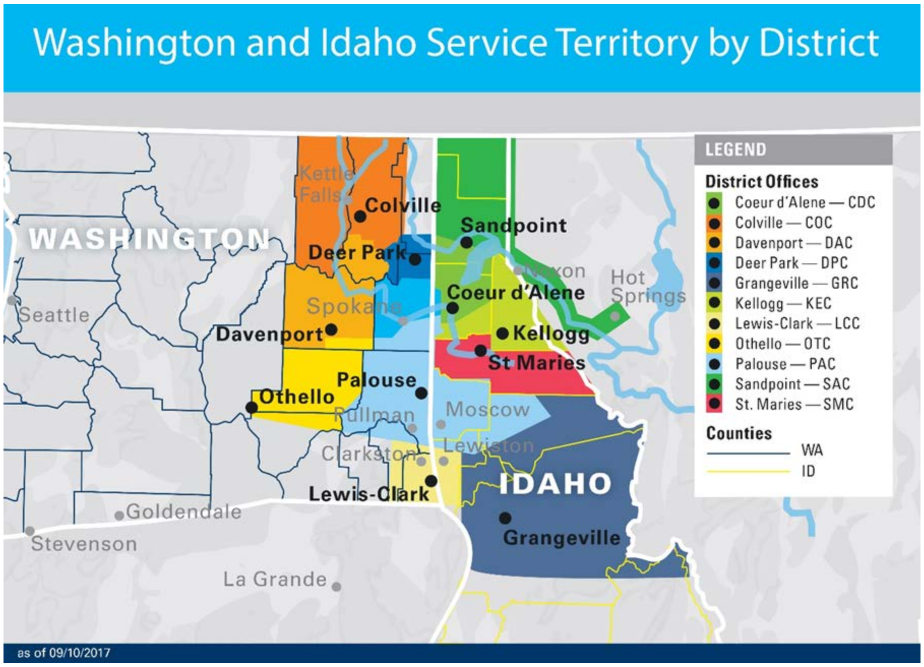
Figure 10. Illustration of major elements of a utility electric system, depicting the generation, transmission and distribution of electricity to end-use customers.



Though the bulk of our electric lines (or feeders) are concentrated in urban areas including Spokane, Coeur d'Alene, Moscow, Pullman, Lewiston and Clarkston, we also serve many rural towns, mining districts and agricultural and forest areas. Our diverse service area is organized in twelve geographic operating districts, however, for the purpose of reliability reporting, two of the districts are combined.[38] In addition, two of our operating districts straddle the Washington and Idaho border, which results in the commingling of a portion of our jurisdictional customers. A map of Avista's electric service territory showing the boundaries of our operating districts is provided below in Figure 11.

[37] Though interconnected with electric distribution feeders, substations are not considered part of the distribution system for the purposes of this plan and report.
[38] Reliability results for our operating districts in Kellogg and St. Maries are combined and reported under the Kellogg District.

Figure 11. Avista Utilities' electric service area in Washington and Idaho, showing boundaries of geographic operating districts.



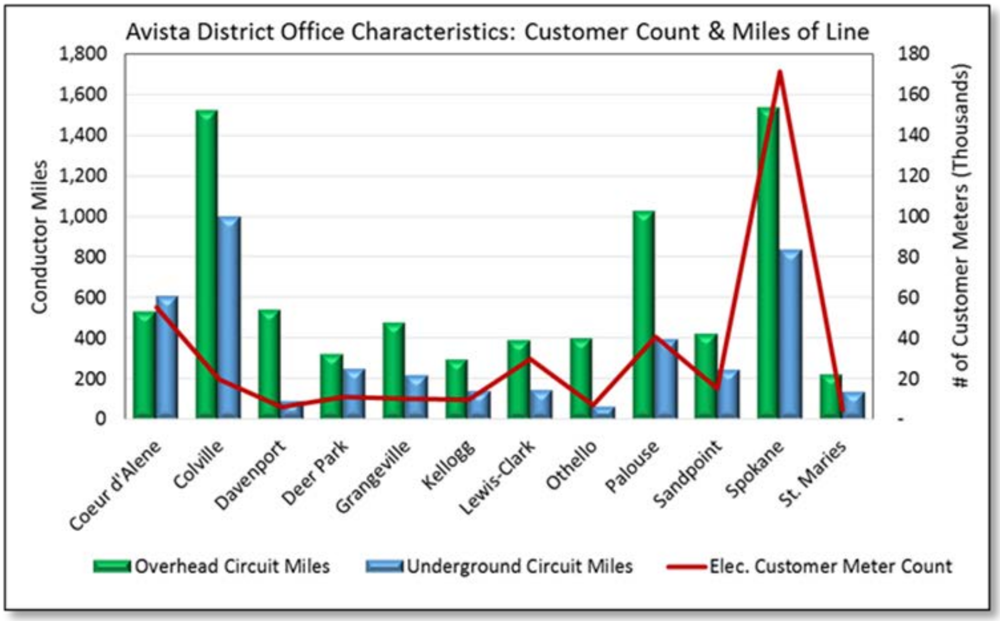
Each operating district has its own unique characteristics and associated challenges, including heavily forested areas, steep mountainous terrain, dense or very sparse customer numbers, diversity in the size of customers, exposure to wildfire risk, and ease of accessibility for crews and equipment. Some of the key characteristics of each operating district are shown the table below.

Table 21. Summary characteristics of Avista Utilities' electric system operating districts in its Washington and Idaho service area.[39]

District Office:	Overhead Circuit Miles	Underground Circuit Miles	Elec. Customer Meter Count	# Primary Meters	Customers per Circuit Mile	Number of Feeders	Number of Transformers	Number of Structures
Coeur d'Alene	530.7	609.0	55,136	13	48.4	38	9,468	23,148
Colville	1521.7	999.6	19,681	7	7.8	26	8,956	23,250
Davenport	541.6	87.6	5,941	4	9.4	13	3,935	11,720
Deer Park	320.9	248.8	10,934	0	19.2	9	3,025	8,069
Grangeville	474.5	216.9	10,106	12	14.6	22	4,495	9,648
Kellogg	293.0	140.1	9,834	13	22.7	19	3,353	7,637
Lewis-Clark	390.2	143.0	29,615	24	55.5	28	7,676	13,000
Othello	397.5	60.4	7,008	5	15.3	15	3,629	8,011
Palouse	1029.5	393.2	40,486	17	28.4	46	9,381	22,094
Sandpoint	422.2	243.3	14,993	2	22.5	17	4,963	11,902
Spokane	1535.4	835.2	171,384	55	72.3	116	28,112	59,536
St. Maries	223.8	136.5	4,575	2	12.7	4	2,159	4,878

[39] From Avista Electric Distribution Infrastructure Plan for 2017.

Some of the key differences among the statistics for these districts are shown in the figure below. For example, the Colville and Spokane districts have nearly the same number of miles of overhead and underground feeder circuits, however, Spokane has over 170,000 customers and approximately 72 customers per mile of line, while Colville has just under 20,000 electric customers and just under 8 customers per mile.



The more striking difference between these two districts, however, is in the number of feeders that comprise the total miles of line. Spokane customers are served by 116 feeders, while our Colville customers are served by just 26 electric feeders. This factor means that an electric customer in Spokane is connected to a feeder that is on average just over 20 miles in length, while the Colville customer is served from a feeder that is on average 97 miles in length. Since the length of the feeder is one key measure of the exposure of customers to a service outage, one can easily see how the operating conditions among our districts can vary widely.

Main Street in Historic Wallace Idaho. Served by Avista since 1903.

Avista's Perspectives on Electric System Reliability

Customer Satisfaction with Service Reliability

The Company's overall reliability objective has been to generally uphold and maintain our current level of reliability, which we believe, as explained earlier, has been acceptable to our customers.[40] Providing a level of system reliability that customers find acceptable represents a complex balance of customers' experience and expectations, system performance level and variability, a host of other reliability-related service options,[41] customer perceptions about their service, and the capital and expense costs required to provide a given level of service. It has been understood in the electric utility industry for some time now that a customer's ultimate satisfaction with the quality and reliability of their electric service is complex and composed of many factors, many of which have much greater influence than their utility's actual physical system reliability. For residential customers, a 2014 study of customer satisfaction with their utility's electric system reliability[42] reported that customer perceptions about their serving utility were the predominant drivers of the degree to which they were satisfied with their service reliability. Some of these key factors, and the degree to which they explain the customer's satisfaction, include:

- ✓ **Customer perceptions** about how well the utility minimizes the number of outages (explains 49% of the variability in customer satisfaction ratings).

- ✓ **Customer perceptions** about how well the utility minimizes the length of outages (49%).

- ✓ **Customer perceptions** about the accuracy of the utility's estimates of the outage restoration time (34%).

Compared with these perceptions of reliability, the study also looked at customers' recollections of any service outages they experienced in the prior three months, as well as the utility's records of its actual service reliability, presented below.

- ✓ **Customer's recollection** of any short or long-term service outages they experienced in the prior three months (explains 7% of the variability in customer satisfaction ratings).

- ✓ **Actual service outages** (2%).

Put simply, at least for residential electric customers, the actual reliability of the utility's system has very little correlation with the degree that its customers are satisfied with their utility's power quality and reliability.

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[40] 2016 Avista Service Quality Report Card, Found in Appendix B.

[41] Such as the utility posting estimated restoration time for service outages, and the degree of accuracy of the estimates.

[42] Assessing Residential Customer Satisfaction for Large Electric Utilities. L. Douglas Smith, et al., Department of Economics Working Papers, University of Missouri St. Louis, 2014.

Industrial and commercial customers, by contrast, typically place much-greater emphasis on the reliability of their electric service since it can directly, and sometimes dramatically, impact their bottom line. Evidence of that is demonstrated by the computation of the cost impacts experienced by these customer groups under a range of outage conditions, using the Interruption Cost Estimator model.[43] In a recent study conducted by the Company for its advanced metering infrastructure project,[44] the forecast direct financial losses of small commercial and industrial customers accounted for 56% of the total, and medium and large commercial and industrial customers experienced 42% of the total estimated financial losses associated with service outages. Residential customers accounted for just 2% of the estimated financial impacts that are associated with outages on the Company's system.

Adding to this complexity, we also know that customers across our service area who regularly experience far more interruptions than the average, and with much-longer outage duration,[45] do not report a corresponding difference in the level of satisfaction they have with the Company's overall service. We track our customers' satisfaction with the overall service they receive from the Company, which historically and currently is quite high (94.5% in 2017). We know from the electric customer satisfaction surveys conducted by J.D. Power that on average approximately 28% of this overall rating is related to a customer's satisfaction with their power quality and reliability. We also monitor the number of customer complaints we receive each year that are related to issues of electric reliability, which are consistently quite low; in 2017, the Company received 9 complaints directly from our Washington customers related to issues of service reliability. In Avista's overall experience, our customers appear to be accustomed to the level of service reliability they experience in the area in which they live, and they generally believe that to be reasonable for their locale.

These results are not to suggest that 'any level of service reliability' is just fine for every customer in every part of our service area. We would anticipate that customers in our core urban service areas, those who experience extremely-high reliability, would notice and respond quite negatively if they suddenly experienced a sustained reduction in reliability corresponding with that regularly experienced in some of our more-rural and remote service areas, such as portions of Stevens County, Washington (Northport), or of Idaho County, Idaho (Elk City). Customers in Spokane or Coeurd'Alene, as examples, are simply accustomed to (and therefore have come to expect) a very-high level of service reliability. We believe that a significant negative shift in reliability, sustained over time, would not be acceptable to these customers because they would not be accustomed to that level of service and would not understand (or likely accept) why that level of service made sense for the area in which they live.

[43] Interruption Cost Estimator (ICE) model. Lawrence Berkeley National Laboratory, U. S. Department of Energy.
[44] Avista Utilities Electric and Natural Gas General Rate Case in Washington, 2016, UE-160228 and UG-160229 (Consolidated) . Exhibit HLR-3, Appendix B, page 12.
[45] See discussion later in this report.

Limitations of Applying System Reliability Metrics

Our industry and many regulatory commissions have naturally focused on the use of standardized reliability measures of overall system performance because they allow them to characterize with one or two values the combined performance of the utility's system. Consequently, these system statistics are often used as the basis for setting reliability targets, or likewise, comparing reliability among a range of utilities to identify "good" and "poor" performers.[46] Single system statistics, however, as explained above and elsewhere in this report, provide no visibility into the range of reliability performance experienced across a utility's system, the reasons for that variation, the experience and expectations of the utility's customers, and no insight into the many complexities involved in providing acceptable service reliability to all of the utility's customers at a reasonable cost. Because of these factors, the use of system reliability statistics to judge performance, set targets or to guide investments can have unintended consequences for the utility and its customers. The following section lists and describes some of the key limitations of the use of system reliability statistics for these purposes.

Assessing the Adequacy of Reliability Performance – Because a utility's system reliability is complex it can be difficult to evaluate whether it is providing its customers an adequate and reasonable level of service reliability. This is compounded by the fact that annual reliability performance can vary substantially from year-to-year. Looking at the upward and downward swings in system performance over time, it's quite natural to think about years of "good" performance compared with those of poor or "bad" performance. Based on this view, it's also natural to want to put bounds on the utility's performance range to ensure it doesn't fall below some target level that has been judged to be minimally acceptable.

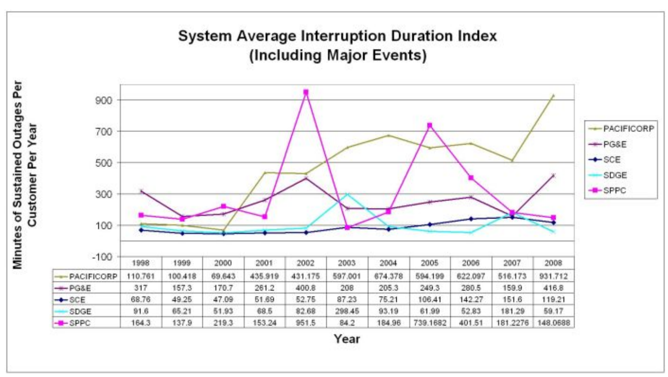
From Avista's perspective, we provide a reasonable and acceptable level of service reliability every year, based on the conditions *that we actually experienced* in that year. For example, we experienced a tremendous number of outages and outage duration time in 2015, but this resulted from hurricane-force winds that produced the greatest natural disaster faced in our 126 year history. Our reliability performance was reasonable for the circumstances we faced that year. It's the same for those years where mild conditions result in our system reliability being extremely high overall compared with other years. Another aberration in our system reliability results, as described previously, is introduced by the industry practice of excluding the outages

[46] Though this is often the case, these comparisons have little value because the system numbers provide no visibility into the system, does not account for differences in utility system design and construction, and fails to account for differences in rural vs urban service or in variability of factors such as weather, landscape or topography.

from major event days from the results we regularly report. Yes, excluding major-event-day outages gives a person a better feel for the utility's 'more-ordinary' reliability performance, but because the exclusion is arbitrary it can distort what are apparently "good" and "bad" performance years.[47]

In short, a focus on reliability statistics at the system level, coupled with the desire to establish bounds on what constitutes reasonable or acceptable performance, ignores the fact that variability in reliability is produced by variation in forces that are largely beyond the control of the utility. It therefore superimposes an arbitrary limit on the capability of the system to perform regardless of the circumstances that are experienced each year. The proper question is what more-granular elements of the utility's service reliability[48] are in need of improvement and why, and what's the plan to efficiently achieve that specific objective. While the treatment of these individual areas of reliability concern will have some impact on the overall system results, they collectively produce a result, they are not driven by a top-down objective to achieve some "system number" for outages or outage duration, etc.

Comparison with Other Utilities – Another approach to defining what constitutes "acceptable" or "unacceptable" reliability performance is to compare a utility's system reliability results with those of other utilities, and to apply a rank-order basis for judging reasonable or unreasonable performance (e.g. third or fourth quartile performance, etc.). This approach too is fraught with problems and limitations because each utility's system, circumstances, and reliability results are unique. One approach to minimize the impact of these many unique differences among



[47] In Avista's case, our system results for 2009 suggest it has been our worst year for the number of outages since we began reporting system statistics in 2005. In fact, Avista did not experience any major event days in 2009, even though we faced several large storms that year that didn't quite qualify as major events. In other words, our results for 2009 reflect all of the outages experienced by our customers that year. When you show the raw reliability numbers (i.e. with the results from major event days included), then 2009 appears to be one of our better reliability years when all outages are considered.

[48] Aspects such as customers regularly experiencing more than 3-5 outages each year, service to large commercial and industrial customers that fails to meet their business needs and expectations for acceptable service, or portions of the service area where brief, momentary outages are especially high.

utilities has been to gather and analyze categories of data for a range of utilities, which can be used to segregate the utilities into groupings that are more similar in nature. This effort involves the identification and gathering of data on such factors as utility size, customer density and the kind of weather exposure they experience. These data are then incorporated into a mathematical model that integrates the data and segregates utilities into "like" groups that Avista refers to as "similarly-situated utilities."

Commission Staff recently authorized such a study to set reliability targets for its three regulated electric utilities who serve in Washington, which was conducted by the firm Power System Engineering.[49] Avista and its sister utilities worked closely with Staff and its consultant to provide system data used in the modeling effort.[50] Modeling results produced a point estimate for the expected number of outages (SAIFI) and outage duration (SAIDI) unique to each utility. These point-estimates represent an expected reliability value based on the reliability performance of other utilities that the model determined were similarly-situated to each utility. The study authors also applied a 95% confidence interval to each point estimate to create a statistically-based range around the point estimate for each reliability statistic.

As one would expect, the modeling results suggest that reliability performance differs among peer groups for the three Washington utilities. This is important, because even with the small number of variables included in the model, it shows the weakness of a direct comparison of reliability results among utilities. At the same time, Avista understands that there are other important variables that were not included in the analysis that can have a substantial impact on the identification and comparison of similarly-situated utilities. For example, our Company was one of the first utilities in the nation to implement a GIS-based, computer-aided outage management tool. Because the outage tool provides much-more complete outage information than is conventionally available (based only on the number of customers that actually call in an outage), it serves to increase the reported value

[49] Reliability Targets for Washington's Three Investor-Owned Utilities. Power System Engineering. March 6, 2017.

[50] Data for model variables included: 1) the level of forestation for each utility; 2) customer density; 3) prevalence of thunderstorms; 4) a statistical measure of elevation; 5) percentage of underground circuits, and 6) conformance with major event day exclusion criteria.

(i.e. produce worse reliability results) for the number of outages and outage duration – even though the utility's actual reliability has not changed, and in fact, may have improved.

The more-important limitation of utility-to-utility comparison, however, is that the results only reveal how a given utility's reliability compares with other somewhat similar utilities. It reveals nothing about the appropriateness of the utility's reliability objectives, whether its strategy for achieving the goal is reasonable, or the degree to which the utility's investments are prudent and efficient. These most important factors can only be evaluated by understanding in some detail the individual utility's operational approach, processes, and practices. Avista was very impressed and pleased with Staff's recent Reliability Review, which appeared to reflect their desire to better-understand some of these factors in nitty gritty detail.

Setting Targets for Overall System Performance – Interrelated with the discussion above has been the practice in some jurisdictions of setting annual performance targets for number of outages, outage duration, and other measures, on the basis that exceeding the target in a given year amounts to a "failure" in reliability performance. Another dimension has been the application of financial penalties to the "failure" to achieve reliability targets. Following are some inherent problems with this approach.

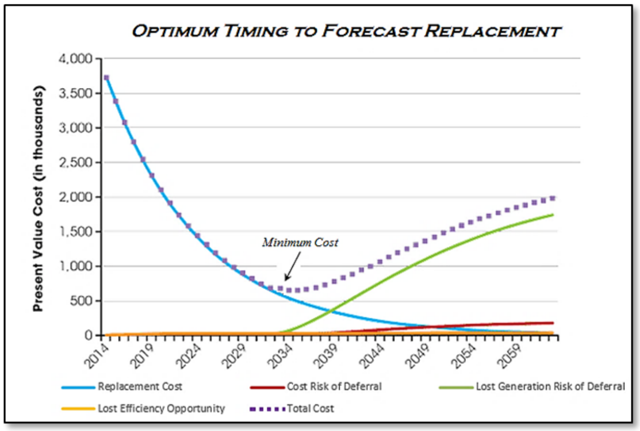
First, approximately 80% of the reliability performance of a utility's system is dictated by the nature of the company's system – essentially, how it's designed and constructed. Simple examples include the breaker and bus design and capacity of substations, whether structures like poles and crossarms are made of wood, steel, iron or composites, and the ratio of the system that is installed overhead versus underground. While the impact of these design and construction choices can be changed over time, it's a decades-long process since most distribution, transmission, and substation plant has an average life span of about 60 years. Setting an annual reliability target, especially an aggressive one, ignores the essential fact that the utility's system generally has a given potential to perform from a reliability perspective. In other words, on a year-to-year basis, the reliability performance of the system is what it is – that is, largely beyond the utility's control. Another fundamental impediment lies in the fact that approximately two-thirds of the utility's system performance is subject to factors such as weather, storms or an outage caused by a car damaging a pole, factors which are generally random in occurrence, and, again, are beyond the control of the utility. Certainly, the reliability impact of some of these variable forces can be mitigated, typically through changes in design and construction practices, but the impact of these changes tend to accumulate slowly over the course of the 60 or so years it takes to completely replace the existing system.

Finally, there are the potential negative consequences associated with a utility's efforts to proceed with more-rapid improvements in system reliability statistics, in an effort to meet annual targets. In order to expedite improvements in overall system performance, the utility must focus on reducing the number of outages and outage duration by investing in solutions that have the greatest possible impact. For Avista, our core urban areas like Spokane or Coeurd'Alene already have very good reliability compared with our smaller communities and more-rural service areas. But since the customer density of these more remote areas is much lower than in urban areas, it requires us to have much-more infrastructure supporting each customer. So, if we're trying "move" the overall system numbers quickly, it only makes sense to focus on investments that improve the facilities that touch the most customers, i.e. those in our core urban areas. The likely result of that approach would be that customers who already have very-high reliability would see some incremental improvement, driving an increasingly larger difference between their reliability and that of our more-rural customers. Another consequence would be that the greatest impact would come from improving the reliability for residential customers, and not our larger commercial and industrial customers. This focus belies the fact that these latter customer groups suffer 98% of the financial impacts of service disruptions. Clearly, a reasoned reliability strategy and investments should focus on "areas" of reliability performance that don't meet the Company's expectations for its customer service, such as customers with ongoing multiple outages each year, core urban areas where reliability is unusually low compared with other urban areas, poor reliability performance in key commercial or industrial districts, or portions of the system where outage restoration is taking particularly long. While the treatment of these individual areas of reliability concern will have some impact on the overall system results, they are not the product of a top-down objective to reduce reliability statistics measured at the level of the overall system.

Reliability Investments

Avista has in the past referred broadly to individual investments we make as having the purpose of "improving reliability." This attribution reflects the fact that many investments, especially distribution investments made to replace deteriorated assets, are very likely to improve the reliability of the specific infrastructure that is being rebuilt or replaced. This is the case because the likelihood of failure of an asset generally increases with age and deterioration over its service life. Avista's many infrastructure investments often include at least a mention of these reliability benefits, and some are quantified and discussed extensively, as in the Company's Grid Modernization Program. In the great majority of cases, however, the *predominant* need for these investments is to replace assets that have reached the end of their useful life, or to a lesser degree, to solve capacity and performance issues, and not for improving reliability.[51] But this timely replacement of assets is crucial to our ability uphold and maintain our system levels of reliability performance. Accordingly, we separate electric system investments that are related to reliability into two groups: “Reliability as a Factor” and “Reliability Projects and Programs,” both discussed below.

Reliability as a Factor – Reliability benefits are considered in almost every program and project in Avista’s investment portfolio as well as among alternatives considered. As an example, our Wood Pole Management Program inspects, repairs and replaces wood poles and associated equipment based on asset condition. One of the alternatives considered was a shorter inspection cycle. This option was considered based on potential reliability benefits, but those benefits were superseded by the additional costs of the shorter cycle and the length of time it would take for the reliability benefits to actually improve overall reliability. To further illustrate this concept, even though reliability is obviously a factor when we replace equipment damaged by storms or required by the State when a road is relocated, it is not the primary driver, as this work is required regardless.



Reliability Projects and Programs – In contrast with the consideration of “Reliability as a Factor,” Avista defines Reliability Projects and Programs as being made primarily or exclusively to meet a reliability objective. In other words, were it not for the intended reliability benefit, the investment would likely not be made. An example of a type of investment that has a substantial reliability purpose[52] is the installation of remote communication capability to a feeder in conjunction with remotely operated equipment. This combination allows a feeder to be “sectionalized”[53] to isolate that portion where the outage is located, thus reducing the number of customers who

[51] In this discussion we distinguish between cases where the rebuilding of a deteriorated feeder will very likely result in that feeder being more reliable when completed, versus the impact that feeder rebuild has on the reliability of Avista’s overall distribution system. The investment will likely improve the reliability of that feeder for those customers it serves, but from a system perspective, that investment serves to “uphold” and maintain our current overall level of system reliability.

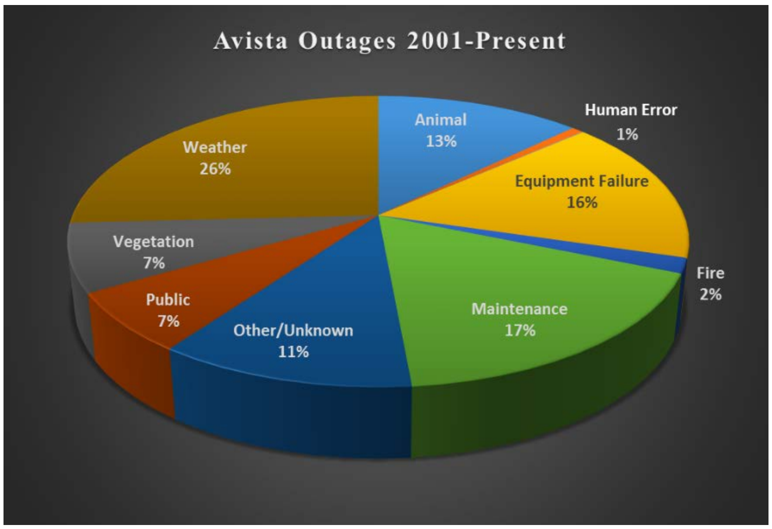
[52] Though it is still not solely for the purpose of improving reliability.

[53] This scheme referred to as Fault Detection, Isolation, and Restoration (or FDIR) refers to the use of switches located along the feeder midline that can be opened to effectively divide the feeder into two or more segments, allowing service on the sections not associated with the outage to be quickly and remotely restored.

experience a sustained outage. Though this investment achieves other substantial value[54] beyond the reliability objective, it is often made to improve the reliability of a feeder for the benefit of those customers. In some instances, without a substantial reliability objective, the incremental investment for the additional equipment may not be made. Even in this example, however, the overriding "system" reliability objective is to uphold our current level of performance, not to improve it.

Evaluation of Reliability Results

Outage Factors – A key focus in our annual reporting is understanding and analyzing the causes of outages, particularly those associated with major events, and identifying any particular pattern that merits further investigation. As shown in Figure 22 of the Company's Electric Distribution Infrastructure Report for 2017, over two thirds of our outages are generally considered outside of our control (wind, weather, fire, animals, equipment failure, some vegetation, and public-caused outages). Weather alone, not including the impacts of high winds and snow and ice, accounts for an average of 26% of our outages over the past 16 years. In addition to these outages, 17% are "planned" outages where service must be disconnected in order to perform work on the system.[55] Together, these outages required for system maintenance, upgrade or repair, combined with forces beyond our control account for over 80% of our distribution outage events.



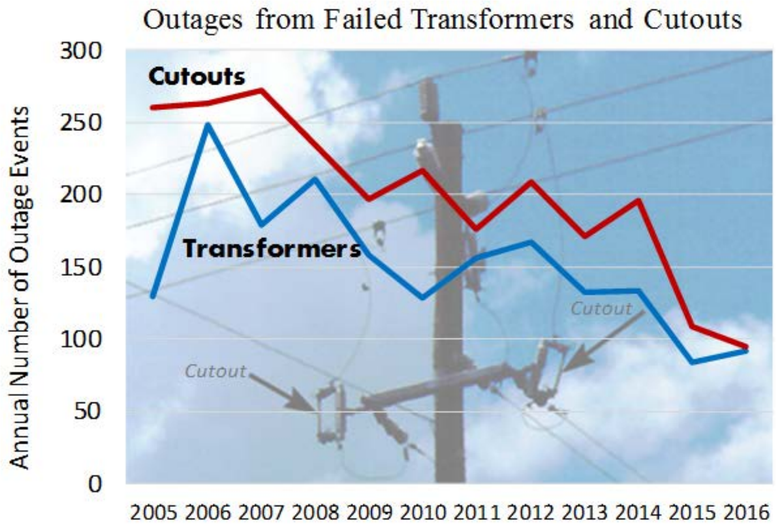
Excluding planned outages and those beyond our immediate control, Avista's "base" system reliability performance is the product of a complex network of factors, and the sum of the individual performances of a wide range of individual assets (e.g. transformers, meters, conductor, insulators, etc.). While our overall reliability trend meets our general objective of upholding and maintaining our current reliability performance, the underlying story is more complex.

Asset Replacements – The reliability of assets is based on how they tend to deteriorate over time, the manner in which they are maintained, the point in their life cycle when they are replaced, and the impact of specific asset condition or reliability improvement projects

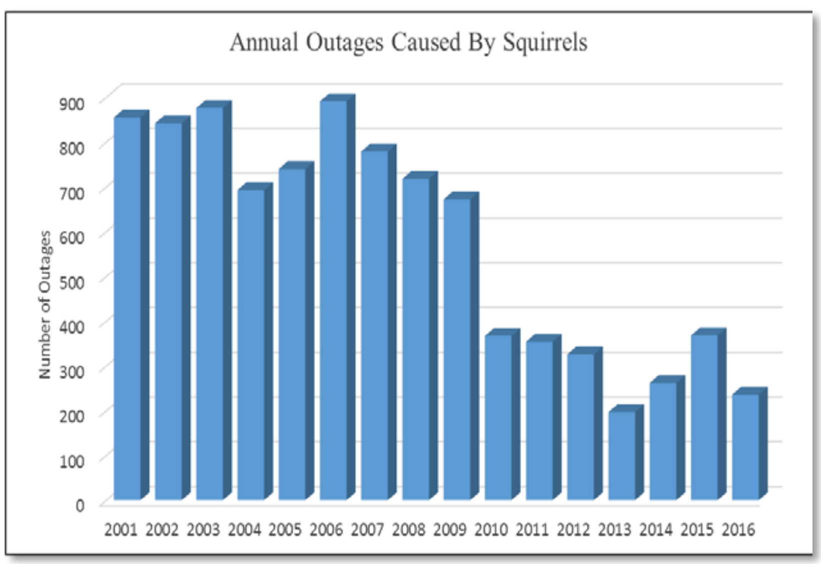
[54] Remote communication of operation of feeder devices can also be used to achieve energy savings through Conservation Voltage Reduction (or CVR).

[55] Avista follows a standardized customer notification process for work that requires us to interrupt their electric service.

and programs. Avista's Grid Modernization and Wood Pole Management[56] programs have had a positive impact on the reliability of overhead distribution infrastructure by replacing end-of-life assets based on condition. In addition to repairing and replacing wood poles, these programs, working jointly, also install new equipment including crossarms, transformers, grounding, lightning arresters, and cutouts. Through the actions of these programs, assets are replaced at the end of their useful life but generally before they are likely to fail, which would have resulted in an outage for our customers. Replacement of these assets, based on the Company's asset management strategy has had a positive impact on the number of outage events experienced by our customers, as shown for transformers and cutouts in the Company's Electric Distribution Infrastructure Plan report.[57]



Targeted Improvements – While the above improvements derive predominantly from the end of life replacement of assets (or "reliability as a factor" investments), the Company, as explained above, does make certain investments that are primarily to improve system reliability. Among examples of these programs is the Company's effort to evaluate and install "squirrel guards" across targeted areas of our distribution system. A squirrel guard is a protective rubber boot that is installed over the insulator and conductor on transformers, reclosers, and other distribution equipment, insulating the equipment from an animal-caused fault. The squirrel guard program has achieved a substantial reduction in the number of animal-caused outages on feeders where they have

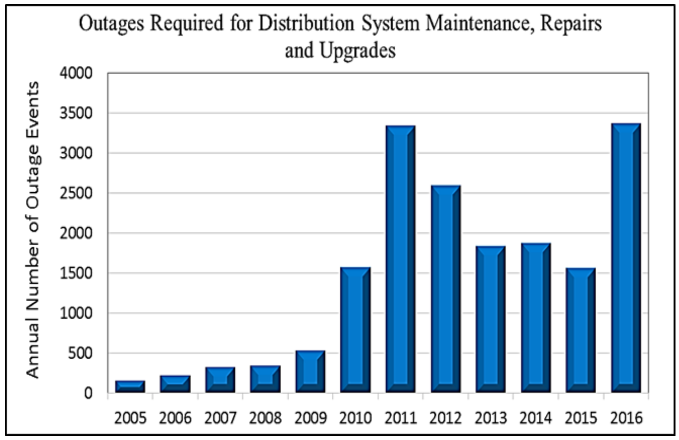


[56] Please see the Wood Pole Management Program discussion (beginning on page 57) and the Grid Modernization Program (beginning on page 64 in this report) discussions and charts for distribution system reliability impacts.
[57] Figure 23.

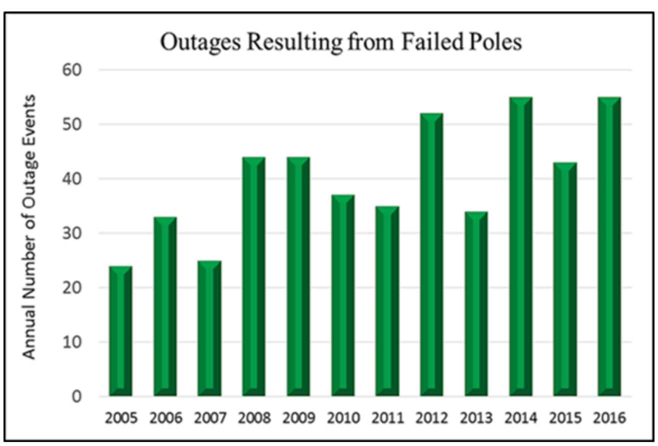
been installed, as shown below in the figure on the right.[58] This treatment has helped Avista achieve a substantial reduction in outage events each year, and squirrel guards are now standard on new installed equipment.

In the example noted earlier, equipping a feeder with remote operations capability through feeder automation has also supported our system reliability objectives. Having the ability to sectionalize a feeder to isolate an outage and restore service to at least some of the customers, has allowed the Company to avoid an average of over 400,000 customer outage minutes per year since 2013.[59]

Continuing Challenges – While these management strategies have a positive impact in reducing the number and duration of outage events we experience on our system, there are other trending factors that are at the same time diminishing the reliability of our system. An example is the number of outage events that result from the Company's need to "de-energize" the system in order to complete maintenance, repairs and upgrades. As Avista has increased the level of its investments in electric distribution infrastructure over the prior decade, we have experienced a corresponding increase in the number of planned outages required to complete this work, as shown in the adjacent figure.[60]



The Company is also experiencing a slightly increasing trend in the number of wood poles in its system that fail each year, resulting in outages for our customers. While Avista's Wood Pole Management Program reduces the number of poles that would otherwise be failing, they are not yet sufficient to stabilize the long term reliability and performance of our wood pole population, as shown in the adjacent figure.[61] This result is due to the changing age profile of our pole population combined with our conservative 20-year inspection cycle, which is expected to result in a continuing increase in the number of pole failures each year.



[58] From Avista's Electric Distribution System Infrastructure Plan report for 2017, Figure 24.
[59] Analysis available upon request.
[60] From Avista's Electric Distribution System Infrastructure Plan report for 2017, Figure 25.
[61] From Avista's Electric Distribution System Infrastructure Plan report for 2017, Figure 26.

Reliability Consequences – Another important consideration in evaluating the Company's approach to managing its system reliability is the significant impact that the type of outage event has on the number of outages and outage duration. For example, the failure of a distribution transformer will likely impact from one to five customers, the same as with the failure of a cutout or an outage caused by a squirrel. Accordingly, the outage benefits provided by the reduction in these types of outages has a proportional impact on the overall reliability numbers for the system. By contrast, the failure of a pole may interrupt service for an entire feeder, impacting up to several hundred customers, and, depending on the location of the pole, may cause an extended outage. The same general magnitude in reliability improvement can be applied to the benefits provided by feeder automation. When an outage results in the interruption of service on the entire feeder, remote operations can be used to sectionalize the line and avoid a sustained outage for many of the customers served on the feeder. For outages resulting from planned work on the system, the interruption ranges from impacting a single customer to occasionally affecting customers served on an entire feeder, and in unusual cases, an entire substation, which interrupts all of the feeders tied to that station (potentially in the range of a thousand or more customers).

This very brief discussion is intended to illustrate why we often consider investments in electric distribution as being made to "improve reliability." Whether we are avoiding outages that would have occurred due to failures in deteriorated assets, such as with wood poles, or cases where we are actually bringing the base assets to a higher reliability standard, as in the case of squirrel guards and feeder automation, we are increasing the reliability performance of the targeted infrastructure. But from an overall system perspective, these individual improvements in reliability, when combined with the cumulative performance of all of our assets, allow us to generally uphold and maintain our overall current level of reliability performance.

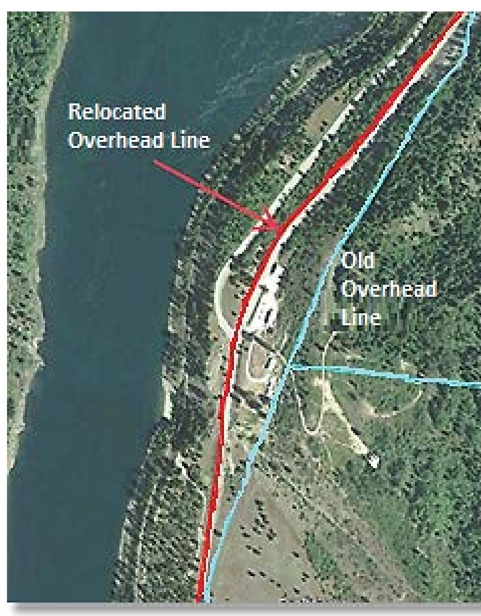
Variation in Reliability Performance Across our Electric System

As noted above, an overall system reliability number masks the wide range of performance we experience in electric reliability among the feeders within an operating district and among the districts themselves. The example we mentioned earlier for our Colville district highlights this fact. This district has approximately 2,500 miles of distribution feeder lines, both overhead and underground. These feeders are predominately rural and serve approximately 19,000 customers. This number of feeder miles exceeds that of the Spokane district, which serves approximately 170,000 customers. More importantly, though, Colville has only 26 individual feeders, compared with 116 feeders in Spokane. This means that individual Colville feeders are, on average, almost 4.5 times as long as those in Spokane. Because the number of feeder miles and the length of individual feeders is correlated with service outages, our Colville customers have a much greater risk of experiencing an outage than do our customers in Spokane.

In addition to the number of miles and the length of feeders in Colville, the locations of the lines themselves also play an important role in service reliability. Colville feeders tend to be located on narrow cross-country rights-of-way as constructed by the local public utility district (PUD) in the years before Avista acquired the system in the 1950s. These conditions not only increase the likelihood of an outage, but they make it difficult for crews to patrol the line to find the cause of the outage, and to get material and equipment to the site in order to perform repairs, thus extending the length of outages. A lengthy trip for our line crews may also be required to reach the site, since this District encompasses over 2,400 square miles. These differences in feeder characteristics are manifest in the average number and duration of outages for Spokane and Colville in 2017, as shown in the table below.

Reliability Measure	Spokane	Colville
System Number of Outages (SAIFI)	0.72	3.7
System Duration of Outages (SAIDI)	87 Minutes	707 Minutes

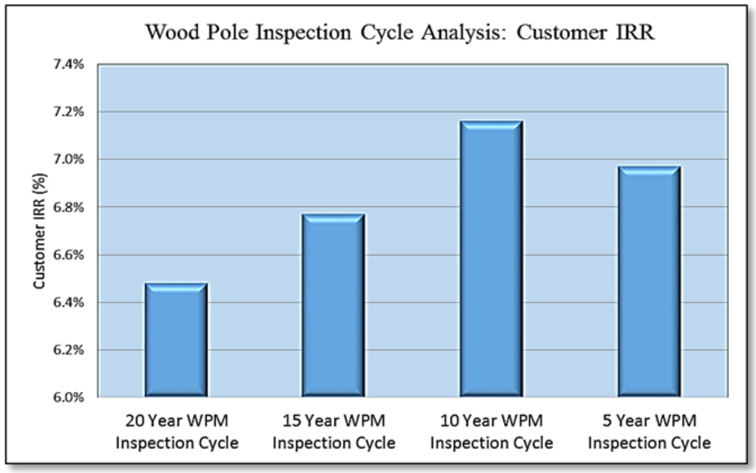
As expected from the feeder data discussed above, Colville customers on average can expect to see five times the number of outages and 8 times the outage duration as the average customer in our Spokane District.



In each of our districts, outages are analyzed by individual feeder to assess areas of concern for reliability performance. These “feeders of concern” are most often rural since it’s normal to have a greater number of outages per customer on these often lengthy and extensive systems. For selected feeders of concern, Avista develops work plans with individual treatments tailored to each feeder. These treatments include such improvements, when cost effective, as moving sections of overhead lines onto public road rights-of-way for easier access, converting them to underground circuits, accelerating or targeting vegetation management and wood pole inspection, improving fuse coordination, dividing individual feeders into two separate feeders, as well as using feeder automation to sectionalize individual feeders. For a brief summary of the Company’s feeders of greatest concern, please see Appendix D.

A Building Focus on Electric System Reliability

Over the prior decade and before, the Company has had an increasing focus on its electric system reliability overall, and in particular on the reliability aspects of its many investment decisions. Our renewed focus on the discipline of reliability engineering began in 2002 with the establishment of a formal asset management group. Avista took another step in 2004, acquiring new, sophisticated asset management tools to improve the analysis of equipment life, reliability and maintenance costs. Specific classes of equipment were prioritized for this analysis, which was used by Avista's engineers in 2007 to develop a new program known as Distribution Reliability and Energy Efficiency. The expertise of Avista's asset management group continued to expand over time and its resources and capability were substantially increased again around 2011. This group continues to bring new asset groups under lifecycle analysis and formal asset management plans, continuing to focus on the lifecycle cost and reliability aspects of infrastructure decisions.



In October 2009, Avista was chosen to receive a matching grant of approximately $20 million from the U.S. Department of Energy for a Smart Grid Investment Grant to upgrade portions of its electric distribution system to smart grid standards. Another grant referred to as our Smart Grid Demonstration Project also focused on these distribution system upgrades. These grants were intended to accelerate and expand on the deployment of the Company's Distribution Reliability and Energy Efficiency program, and were used to initially fund improvements on 58 electric distribution feeders and 14 substations, serving approximately 110,000 electric customers. The projects included installation of new equipment and software used to enable Smart Grid capabilities to increase the reliability and efficiency of the feeder. Among other improvements, the project included the installation of 380 line devices used to monitor and automate certain distribution operations.

As part of these investments, the Company installed a Distribution Management System to support applications enabling Fault Detection, Isolation and Restoration and Integrated VOLT/VAR control (or IVVC) for these feeders. The Distribution Management System provides significant real-time data reflecting the distribution system's operational behavior. This level of intelligence enables more visibility into the distribution network via configuration management, performance monitoring, and network fault monitoring.

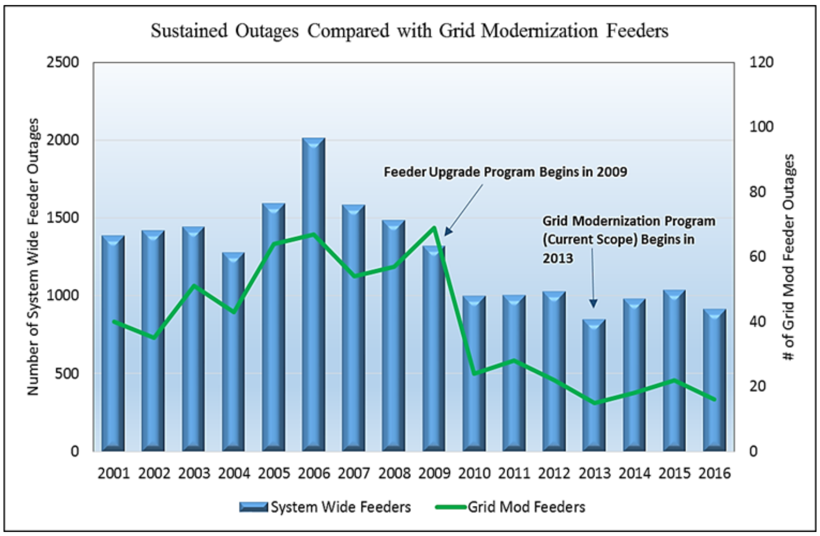
The Company's experience and success with both of its smart grid projects helped support the development of a new integrated program, referred to by Avista as Grid Modernization. This effort is the integration of all programs designed to upgrade system feeders into one evaluation and construction process. These individual programs include energy efficiency and reliability, compliance with construction code requirements, wood pole and transformer management, and the addition of remote communications and operations capabilities on qualifying feeders. In addition to rebuilding the feeder and bringing it up to more-current code, the program focuses on three objectives: reducing maintenance expenses; reducing line losses (energy efficiency), and increasing service reliability.

Engagement with Commission Staff - In recent years Avista has also been much-more engaged with Commission Staff on various topics related to our electric system reliability. Initially, Staff focused on the Company's frequent use of the phrase to "improve reliability" as the justification for many of the electric system investments we made each year. This justification was literally (and naturally) translated as an effort to improve the reliability performance of our overall system. Among other inquiries, Staff focused on the general themes of 'what new level of reliability we were intending to achieve,' 'why the existing level was inadequate,' 'how our current and planned investments were expected to deliver this new level of reliability,' and whether our planned investments were cost effective and efficient.' The Company also engaged with Staff on the subject of electric system reliability during the course of negotiating our Customer Service Quality and Reliability program in 2015, which of course is the subject of this report. While Staff was initially interested in having the Company adopt annual reliability targets for number of outages and outage duration, accompanied by financial penalties for non-attainment, parties to the discussion were ultimately able to agree that Avista would only report its annual system numbers for outages and duration, both for the current year and in the context of its five-year rolling averages.

Staff Reliability Review - Our reliability discussions with Staff continued to develop during the benchmarking study commissioned by Staff, as previously described, and were most-recently capped by Staff's reliability review conducted in February of 2018. A portion of the reliability review discussions focused on key questions posed by Staff related to how the Company could better integrate its reliability plans, analyses, investments, results and responses into a more integrated "story" that would help educate Staff and the Commissioners in a more-holistic manner. The highly-modified format for this current electric system reliability report is the result of those discussions, and represents Avista's initial effort to provide information that is more responsive to the interests and needs expressed by Staff.

Avista's Forward Reliability Plans

While our various indicators tell us that we've been in about the right place with respect to our service reliability, Avista believes the time is right to refocus and look forward toward assessing our longer-term reliability trends and needs. For example, the Company has not conducted an assessment of our likely long-term trend[62] in system reliability, given the investments we have made historically, are making today, and are planning for the relatively near future. While the reliability of our wood pole population is degrading slightly, we have made a number of "offsetting" investments over the years, such as installing squirrel guards or automating feeders, which have helped us maintain our overall performance. At the same time, Avista, the industry, and our regulators, are evaluating new aspects of reliability such as resiliency, as well as understanding how more-variable weather events heighten its potential importance. Not to mention just stepping back to look at all the complexities of providing reliable service to understand if we're focused on the right measures of what's important to our customers. We know that nationally customer expectations for reliable service are increasing, and that they are paying attention to new aspects of reliability, such as the negative consequences of brief interruptions in service. It may also be a good time to look more closely into the reliability performance of our system by operating district, and to refocus our investments based on new strategy insights.



Developing an Avista Reliability Strategy and Plan – An effort to reassess our system condition and needs, potentially-shifting customer expectations, and the spectrum of elements of reliability that are of importance to our customers would provide a good foundation for developing a forward strategy and accompanying work plan. This strategy and plan would guide Avista's efforts to provide the right levels of service reliability to all of our customers at the right price, both now and far into the future. The reliability strategy would define and support the areas of focus and the "goals" we intend to achieve over

[62] Long-term trend refers to the likely trajectory of our system reliability based on current and forecast condition of the assets and the types and levels of infrastructure investment we are making or planning to make at the current time. As an example, we know that the reliability of our wood pole population is deteriorating and will continue to do so under our current wood pole management program.

time,[63] while the reliability plan would lay out the objectives and metrics to guide the implementation of the strategy.

Actionable and Achievable Measures and Targets – Critically-important aspects of successful implementation plans lie in their articulation of measures or targets to be achieved that are both actionable and achievable in nature. "Actionable" here means that the Company can identify specific actions to be taken that will *directly and measurably impact* the achievement of the target. For example, having an objective to achieve a particular long-term result for outage duration, absent an underlying detailed implementation plan such as described below, may not be actionable. This is because the organization needs a plan that lays out the specifics of what everyone needs to accomplish during the year to make that happen.

"Achievable" on the other hand means that the capacity to achieve the target is completely, or at least very predominantly, within the control of the Company. Achievable means that it is within the Company's means and control to decide whether or not the target is achieved. As explained earlier, an annual target for system average outage duration does not meet this standard of achievable. This is because the annual results are very largely outside the control of the Company, due to more or less random events such as wind, weather, fire, car-hit-pole, required planned outages, or a freak failure of major equipment, etc. It's also the case because the investments made each year to achieve the target influence only a very small part of an expansive system, or at least a small part of the variability that determines the annual result. Successful strategies and plans include goals with meaningful measures and timelines, and objectives and targets that are both actionable and achievable.

Alignment and Line of Sight – Finally, in order to achieve Avista's overall reliability objectives in the most effective and efficient manner, the measures and targets established at each level of the organization must all be directly aligned so that every action taken at one level of the organization directly influences the achievement of the target at the next higher level. Getting this alignment means that every investment or action taken is directly impacting our ability to achieve the Company's highest-level objectives. Line of sight means that every employee that has a role in implementing the reliability plan can see clearly how what they are doing is directly impacting the achievement of targets at every level. There is no confusion or disagreement about why they are doing what they are doing, and why

[63] Goals are best stated as aspirational things to be achieved. They provide direction and focus, orient and guide the development of concrete objectives to achieve them, contain specific measures of progress, and are usually time bound. Goals are thus critical and highly-effective organizational tools even though they are often never fully achieved.

it’s the right thing to do (and sometimes more importantly, what kinds of things they shouldn’t be doing).

The diagram at right illustrates these principles in a simplified manner using the example of a goal to reduce outage duration over a ten-year horizon, and specific actions that will be taken each year as one part of achieving the long-term goal.

For Illustrative Purposes Only

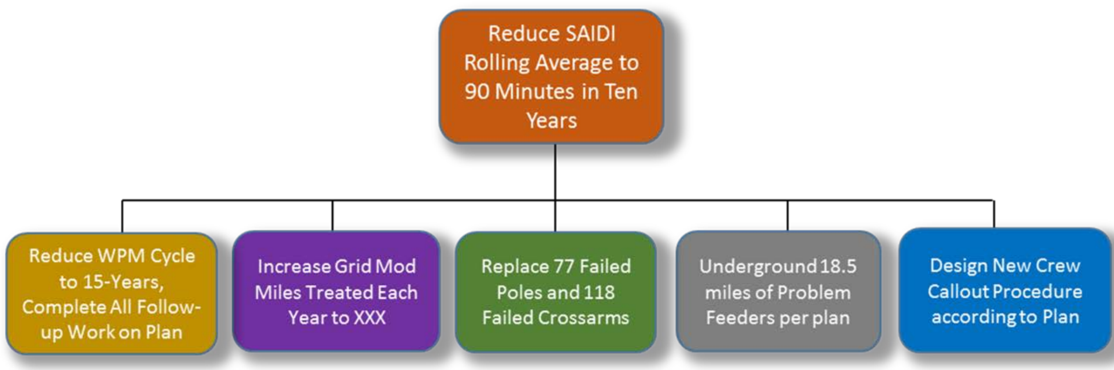
The actions are achievable in this illustration because the Company has hypothetically determined that replacing a given number of failed poles and crossarms over ten years (along with the other actions undertaken) is very likely to produce the target result for outage duration. They’re also achievable because in this example it is within the control of the Company to perform this work each year, and because the manner in which the goal is set (rolling average) helps dampen some of the random variability in the annual results. They’re actionable because everyone in the Company knows specifically what they need to do, and in what amounts, to be successful. And, the example also depicts the important line-of-sight quality of a good strategy and plan since everyone at every level knows what to do and because they can see exactly how their results feed directly into and support the achievement of objectives at every level of the organization above them. And, vice versa from the top to the bottom of the Company.

For Illustrative Purposes Only

In this example, the steps involved in refining our electric system reliability strategy could follow the model presented in the illustration at left. The reliability strategy could be developed in a fairly short period of time by a team of employee experts working full time. The strategy could include a number of individual goals such as the examples as represented in the illustration below. In these examples, it makes sense to have a long-range target to reduce outage duration because you will have identified why it’s important, and in what areas you intend to focus the work. It also makes sense because the Company is not measured against this long-term goal on a year-to-year basis, but rather, looks at multiple years’ of data to understand where our results are "trending" and to assess whether it's appropriate to make course corrections at points along the way.

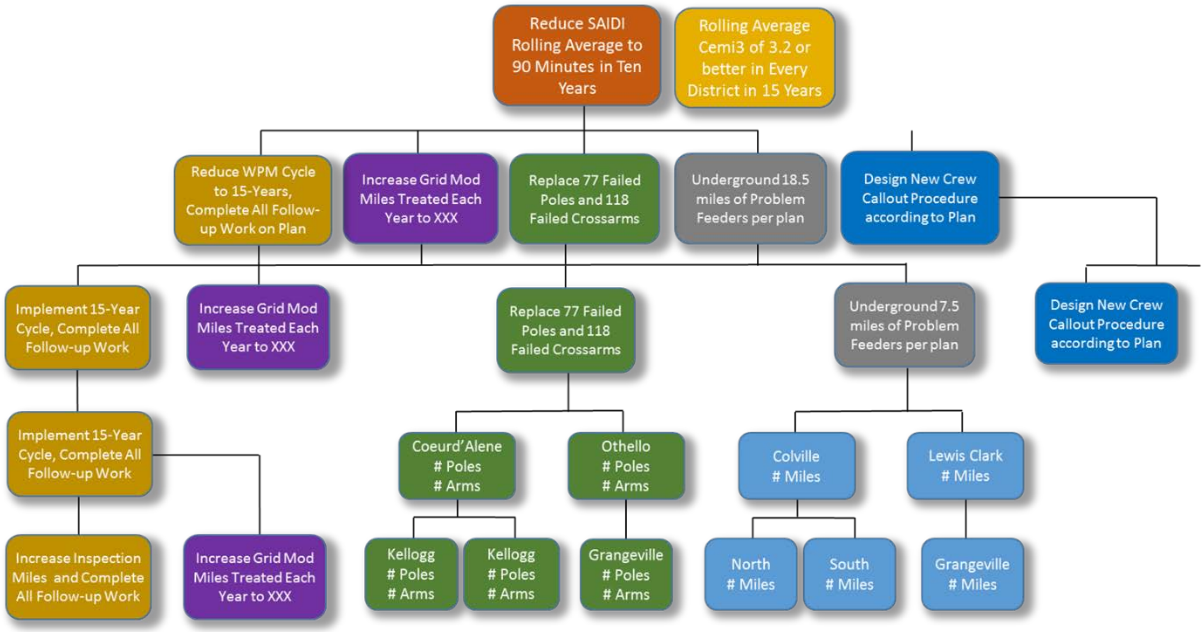
For Illustrative Purposes Only

The effort to develop the reliability implementation plan could involve an employee team working on a part-time assigned basis for a year or longer. There would be some heavy lifting in this effort because the team would have to document a formal analysis of the specific types of actions and investments that could be taken to achieve our overall reliability objectives. The analyses would identify the most cost-effective actions across the system that could be taken, which actions are of highest value when optimized with other needs, and the level (or amount) of investment and actions that would need to be undertaken each year to timely achieve the overall reliability objectives. For illustrative purposes, an example of several reliability plan actions supporting the overall objective of reducing outage duration long term is provided in the illustration below.



For Illustrative Purposes Only

The reliability implementation plan thus translates high-level objectives and their long-term metrics into a detailed plan of work that identifies the specific activities and amounts of work that need to be accomplished in what specific areas in each year of the plan, in order to achieve the long term reliability goal. The diagram below provides an illustrative example of how the work identified in the diagram above could be allocated to each program, operating division and district, as identified by the analysis conducted during development of the reliability implementation plan.



For Illustrative Purposes Only

The measure, then, of whether to Company's reliability objectives have been achieved each year is the degree to which the identified investments planned for in that year have been accomplished.

In its 2019 Customer Service Quality and Reliability Report, Avista will describe any actions taken in 2018 and early 2019 to develop a refreshed reliability strategy and action plan. Accordingly, future reporting will likely be more organized around the Company's reliability strategy and action plan, including the degree to which annual work plans are accomplished, benefits measured in the short term, and our trending toward our long-term reliability objectives.

Results for Avista's Electric System Reliability in 2017

System Results

Results of our four primary reliability measures for 2017 are provided in the table below. In addition to the current-year results we have also listed the prior five-year average for each measure, along with the 2005 baseline value.

Table 21. Avista Reliability Results for Key Measures in 2017.

Reliability Measure	2017 Result*	Previous 5-Year Average (2012-2016) *	2005 Baseline*
Number of Outages (SAIFI)	1.20	1.04	0.97
Brief Outages (MAIFI)	2.46	2.22	3.58
Outage Duration (SAIDI)	183	142	108
Restoration Time (CAIDI)	153	138	112

*Excludes outage results for qualifying major event days.

The charts below show indices for Avista's Washington and Idaho ("system") electric service territory by year. Breakdown by operating division is included later in this report. Each chart shows twelve years of data along with the baseline reliability statistic which is highlighted in green.

Major Event Days

Avista tracks and reports reliability issues associated with major events,[64] and experienced one major event day on its system in 2017, as shown in the table below.

[64] Major Events and Major Event Days as used in this report are defined by the IEEE Guide for Electric Power Distribution Reliability Indices, IEEE P1366-2012. Avista's definition and use of the terms 'major events,' 'major event days' are taken from this IEEE Guide. 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.

Table 22. Major Events[65] and Major Event Days[66] Experienced on Avista's Electric System in 2017.

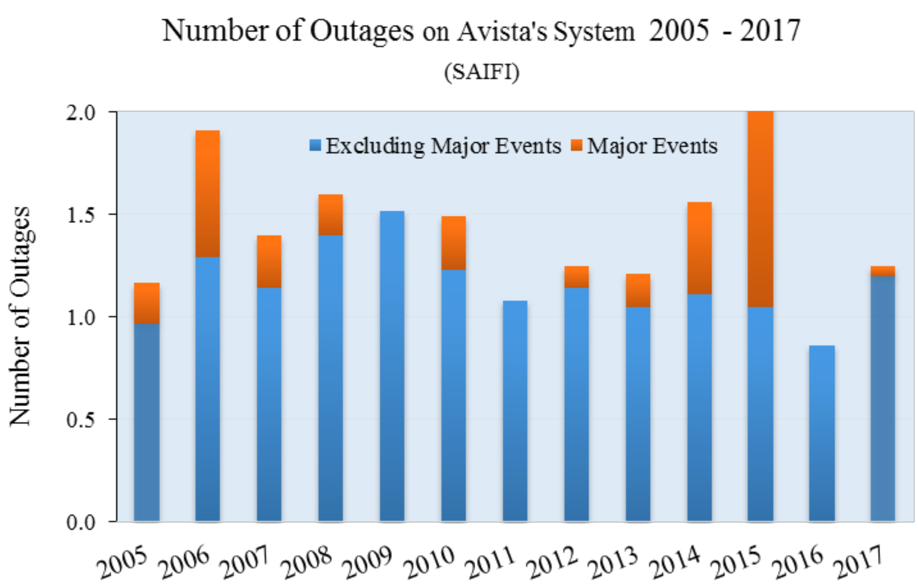
Major Event Day(s)	Outage Duration (minutes)	Event Cause
2017 Major Event Day Threshold	10.19	
December 19, 2017	18.63	Weather – Snow and Ice

Avista reported no major event days on its system in 2016, and a record of our major event days for the period 2004 – 2015 is provided in Appendix E of this report.

Number of Outages (SAIFI)

Historic Performance – The figure below presents the number of outages on the Company's system from 2005 – 2017, reflecting both the total number of outages with and without those associated with major event days.

Figure 12. Number of Outages (SAIFI) on Avista's Electric System 2005 – 2017.



The number of outages for 2017 was well above the prior-year result and was in the highest quartile of results measured on the Company's system since 2005. The average for the

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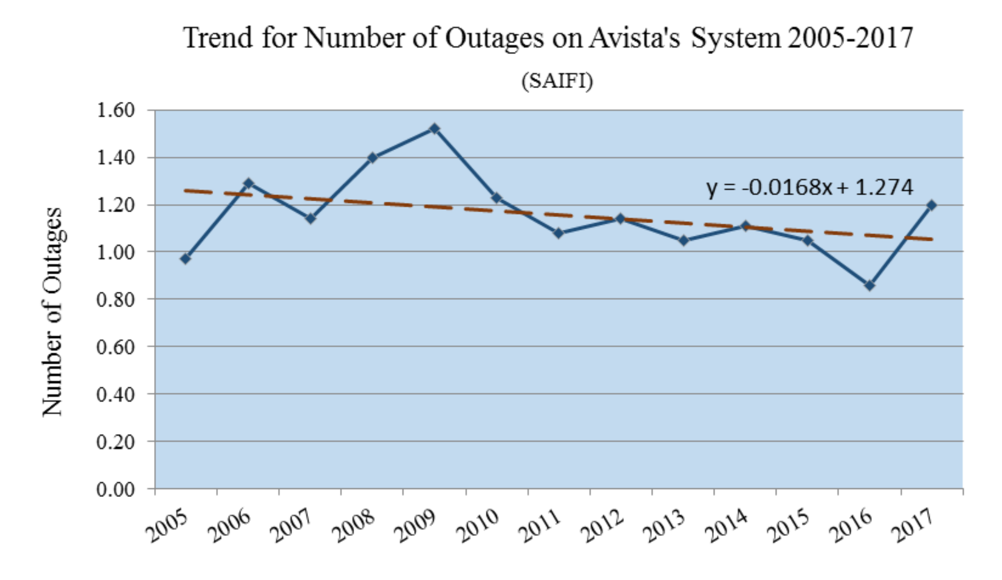
[65] Major Event – Designates an event that exceeds reasonable design and or operation limits of the electric power system. A Major Event includes at least one Major Event Day (MED).

[66] 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.

current five-year period increased only slightly, however, from the previous five-year period. Comparing our 2017 results with those from 2016, which was the lowest number recorded since we began reporting results in 2005, clearly makes the point that randomly-varying factors beyond the control of the Company are the predominant drivers of our annual reliability performance.

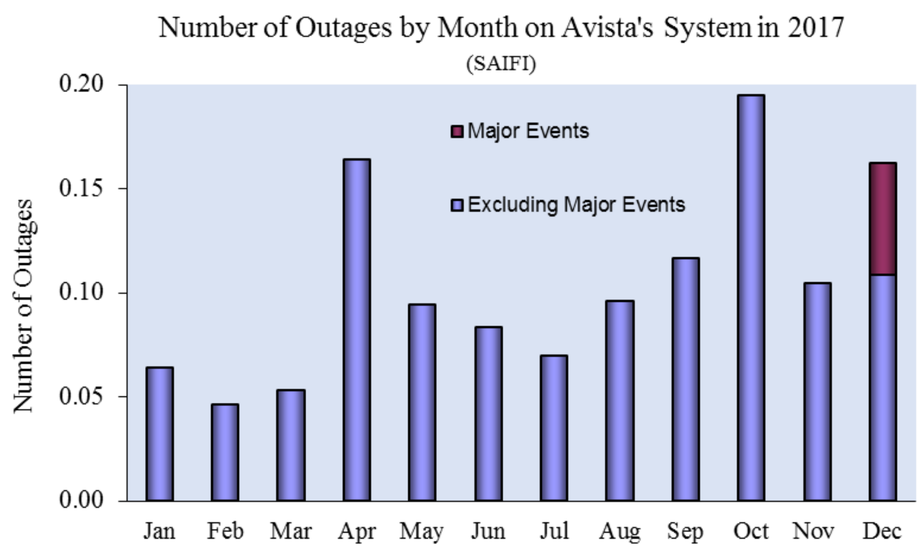
Overall Trend – Though the number of outages in 2017 caused a slight increase in the overall linear trend line from last year, the overall trend remains one of slight improvement in reliability performance over time, as shown in the figure below.

Figure 13. Linear Trend for the Number of Outages (SAIFI) on Avista's Electric System 2005 – 2017.



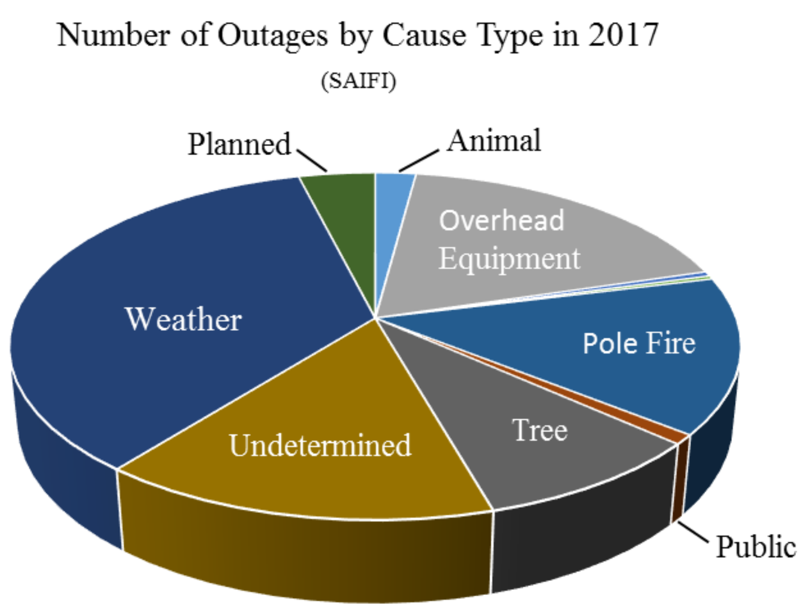
Number of Outages by Month – The figure below shown the monthly contribution to number of outages on the Company's system in 2017. For the months of highest contribution, results in April were impacted by the incidence of failure in overhead equipment and pole fires, October by planned outages for work on the system and incidents related to trees, and December principally by weather and overhead equipment failures.

Figure 14. Number of Outages by Month (SAIFI) on Avista's Electric System in 2017.



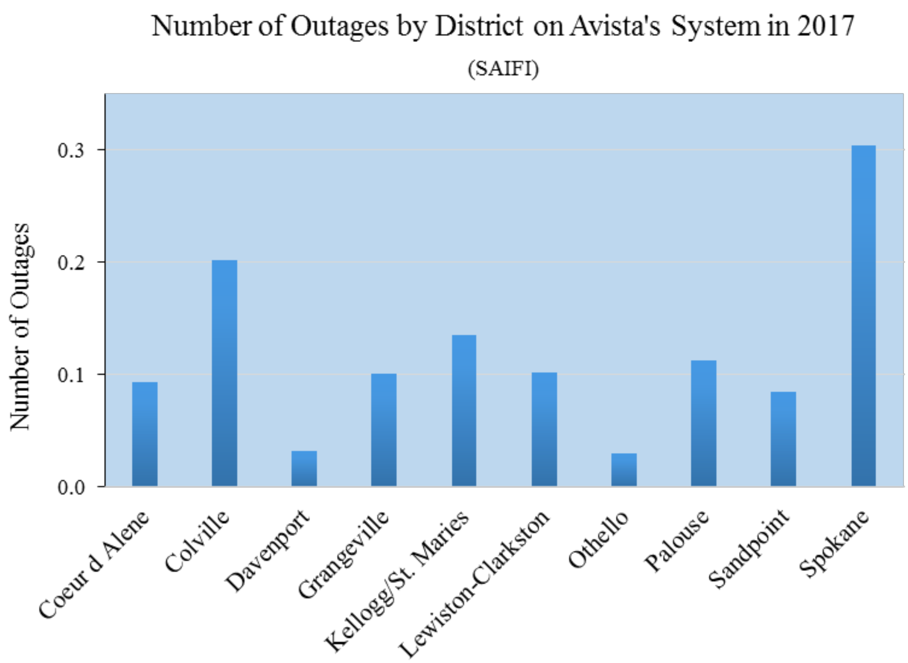
Number of Outages by Cause Type – Contribution to the number of outages by general cause type for 2017 is shown in the figure below. Cause-type definitions are provided in Appendix F to this report.

Figure 15. Number of Outages (SAIFI) by Cause Type on Avista's Electric System in 2017.



Number of Outages by Operating District – The figure below shown the geographic contribution by operations district to number of outages on the Company's system in 2017. Of particular note, as discussed in the previous section, are the relatively high number of outages for some of our more-remote districts, compared with their relatively small numbers of customers.

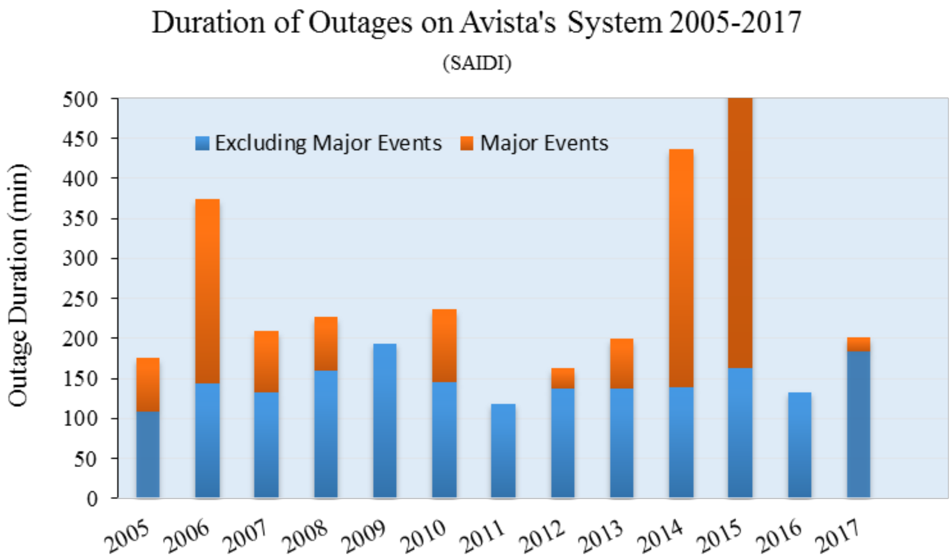
Figure 16. Number of Outages by Operating District (SAIFI) on Avista's Electric System in 2017.



Outage Duration (SADI)

Historic Performance – The figure below presents the duration of outages on the Company's system from 2005 – 2017, reflecting both the total duration of outages with and without those associated with major event days.

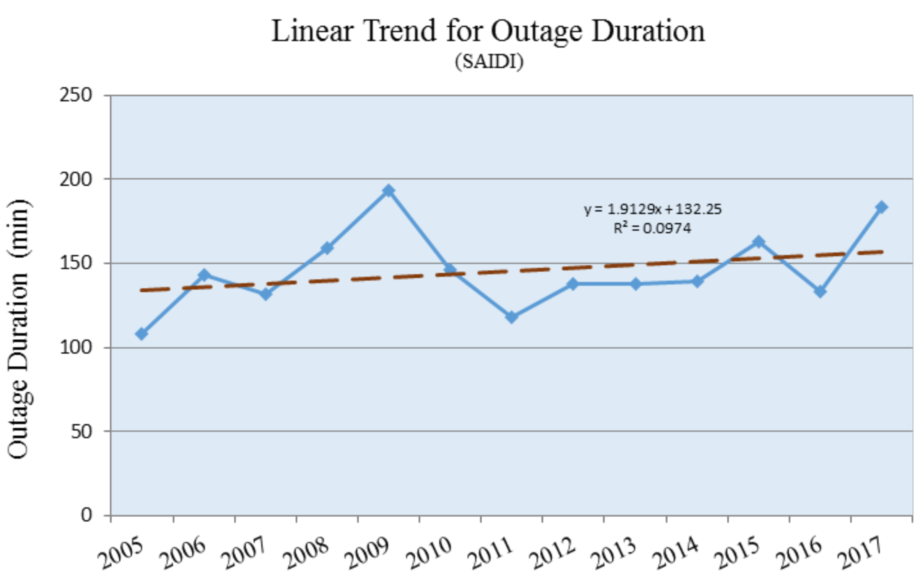
Figure 17. Duration of Outages (SAIDI) on Avista's Electric System 2005 – 2017.



The duration of outages for 2017 was well above the prior-year result, even with the effects of major events removed, and was the second-highest result measured on the Company's system since 2005. The average for the current five-year period increased by nine minutes from that of the previous five years.

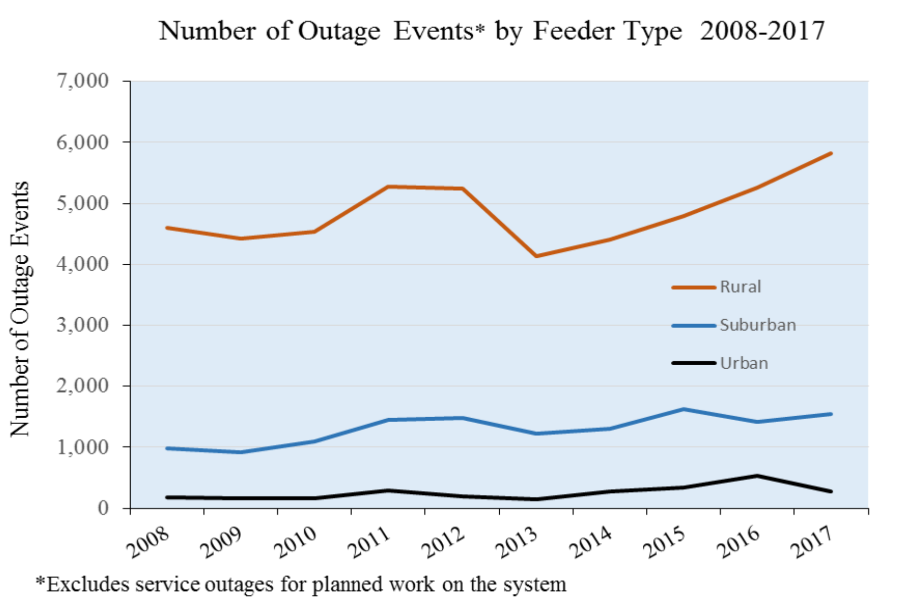
Overall Trend – The result in 2017 caused a slight rise in the overall trend line from last year, adding slightly to the worsening overall trend in outage duration over time, as shown in the figure below.

Figure 18. Linear Trend for the Duration of Outages (SAIDI) on Avista's Electric System 2005 – 2017.



Trend Evaluation – This trend in reliability performance, while not meeting the Company's overarching objective,[67] may or may not represent a problem for our customers that demands immediate attention. To better evaluate the implications of this trend, we identified the underlying cause as an increase in the amount of time it's taking to complete repairs following an outage event. Our first question was whether we were experiencing a shift in the types of outages on our system, the idea being that the time it takes to complete repairs can vary widely (e.g. restoring an outage resulting from a failed pole takes much more time than re-fusing a transformer). Because we didn't see any particular trend in the prevalence of outages by cause type, we were interested in whether any changes in work practices were impacting our restoration times (i.e. is our approach to conducting the work changing in ways that require additional time for restoration?). At this point, we don't have any particular evidence that our repair processes are taking longer. We also took the opportunity to determine if there were any emerging trends in the differences in the incidence of outages based on geographic location. The idea here is that since outages in our more rural areas take longer to reach, typically require more time to patrol to find the cause of the outage, and more time to repair, an increase in the incidence of outages in our more rural areas could show up as a system-wide increase in overall outage duration. In this assessment, we did see a strong trend of increasing numbers of outage events on our more-rural feeders, compared with the increase in events on our suburban and urban feeders, as shown in the figure below.[68]

Figure 19. Numbers of Outage Events on Avista's Electric System 2005 – 2017.

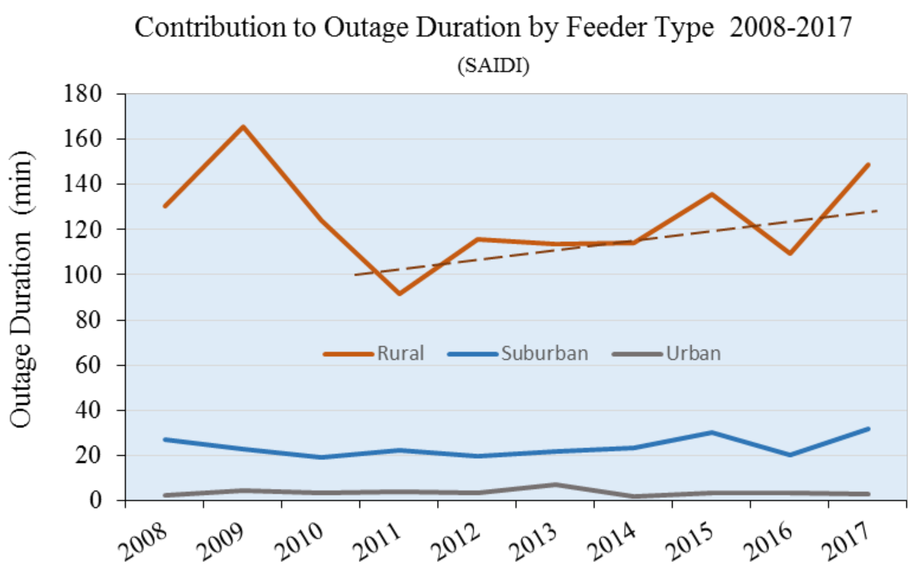


[67] Avista's overarching reliability objective has been to generally maintain and uphold our current levels of electric system reliability (measured at the system level).
[68] For this analysis, Avista defines rural feeders as having 50 or fewer customers per mile, suburban as having between 50 and 150 customers per mile, and urban as having greater than 150 customers per mile.

The number of outage events shown here is a record of the individual failures on our system each year that result in an outage for some number of our customers, but it's not tied to the number of customers that were impacted. It's a different measure than the number of outages (SAIFI), because the latter is a measure of the number of outages on a per customer average basis.

We also looked at the likely impact of this trend on the duration of outages by the same three groups of feeders: rural, suburban and urban. In this analysis, we evaluated the contribution to our overall outage duration (SAIDI) from each of these groups of feeders, as shown in the figure below.

Figure 20. Contribution to Annual Outage Duration (SAIDI) by Feeder Type on Avista's System 2005 – 2017.

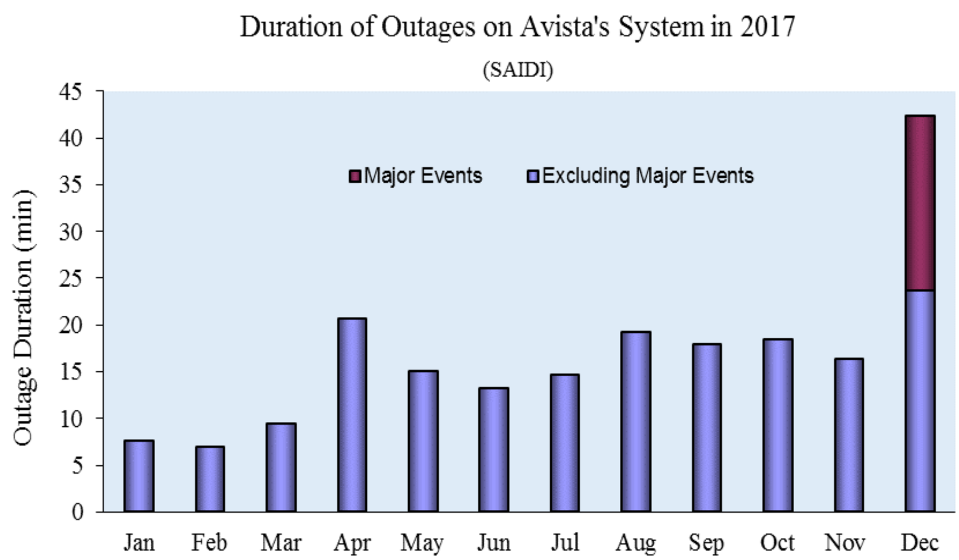


This analysis integrates the number of outage events occurring on these three groups of feeders, along with the number of customers impacted by these events, and assigns a representative portion of the annul outage duration (SAIDI) minutes to each feeder group. The result shows that outage events on our rural feeders over the prior seven years are driving an increasing trend in system-level outage duration, much more so than on our suburban and urban feeders. This, in spite of the fact that outage events on our rural feeders typically impact many fewer customers than similar events on our suburban and urban circuits. The fact that we have so many more outage events on our rural system, coupled with the reality that they take on average much longer to restore than on suburban and urban circuits, translates into our rural feeders having the predominant impact on our overall system-level increases in outage duration (SAIDI).

Future Assessment – Further investigating this trend, as well as evaluating its consequence for our customers (and likely remediation costs), will be one of the topics addressed during the Company's pending review of its electric system reliability strategy and implementation plan, as described in the previous section of this report.

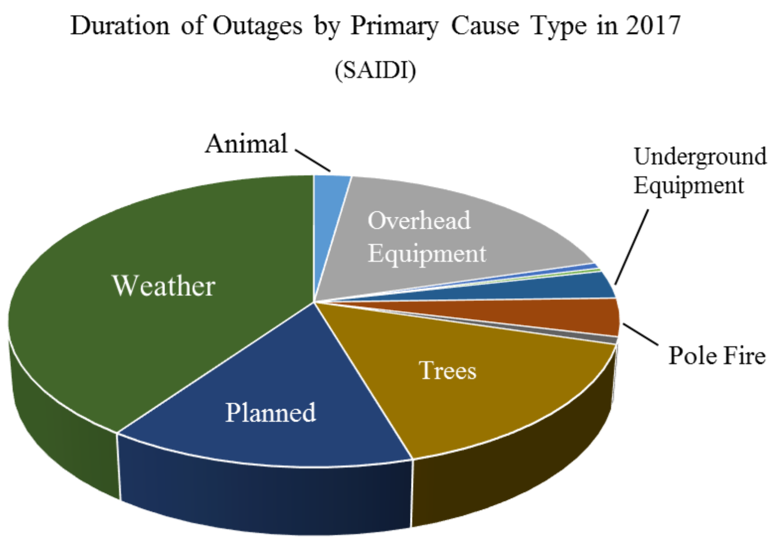
Duration of Outages by Month – The figure below shown the monthly contribution to number of outages on the Company's system in 2017. Overall, we experienced relatively little variability month-to-month with the exception of results in December, which also included the impact of a major event.

Figure 21. Duration of Outages by Month (SAIDI) on Avista's Electric System in 2017.



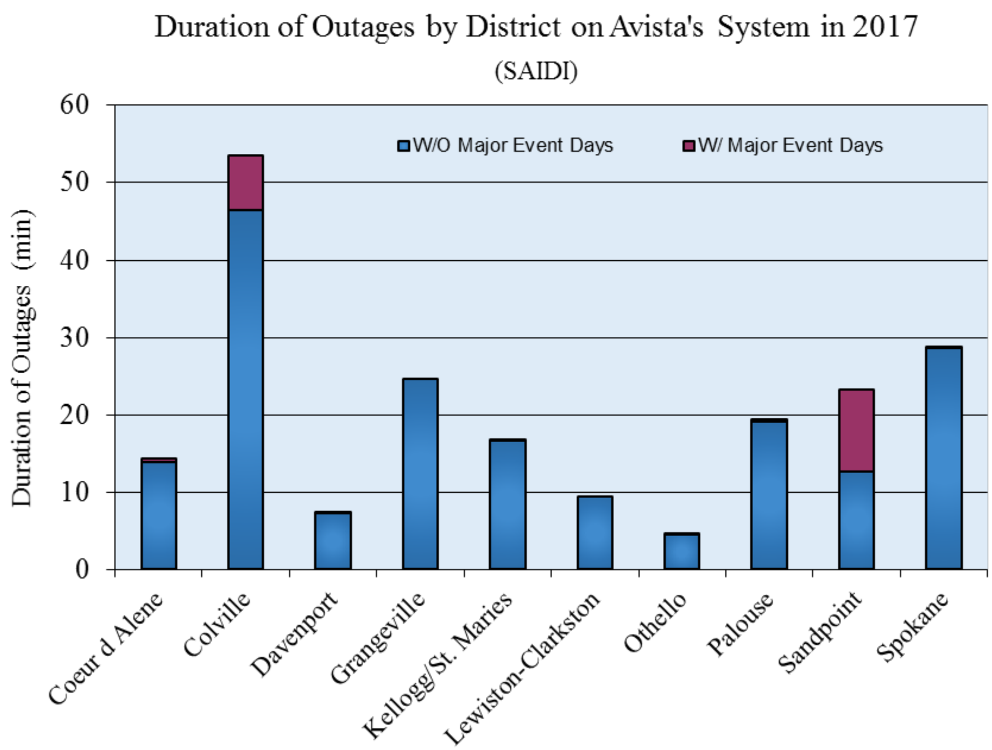
Duration of Outages by Cause Type – Contribution to the number of outages by cause type for 2017 is shown in the figure below.

Figure 22. Duration of Outages (SAIDI) by Cause Type on Avista's Electric System in 2017.



Duration of Outages by Operating District – The figure below shown the geographic contribution to number of outages in the Company's system by operations district in 2017. Of particular note, as discussed in the previous section, are the relatively high number of outages for some of our more-remoted districts, compared with their relatively small numbers of customers.

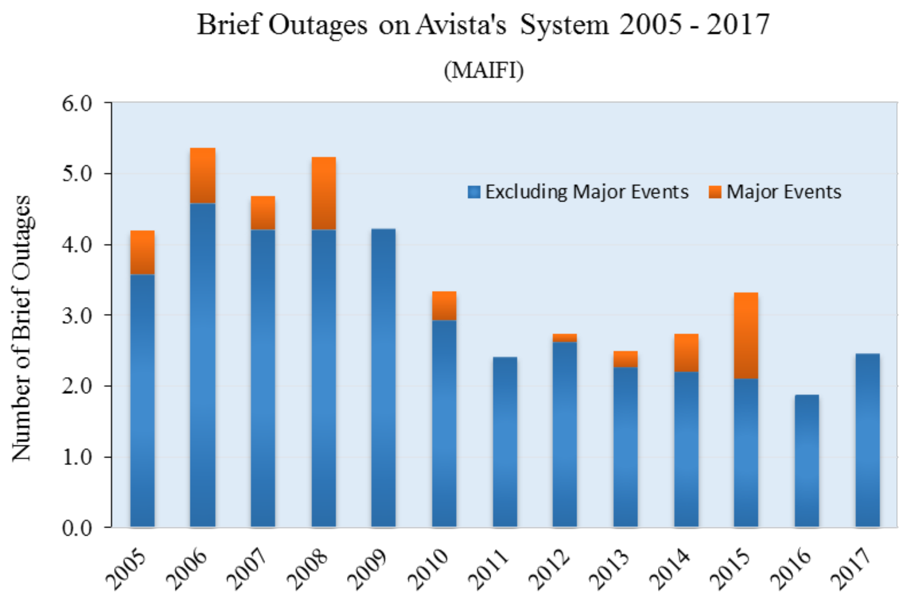
Figure 23. Duration of Outages by Operating District (SAIDI) on Avista's Electric System in 2017.



Brief Outages (MAIFI)

Historic Performance – The figure below presents the number of brief outages on the Company's system from 2005 – 2017, reflecting both the total number of brief outages with and without those associated with major event days.

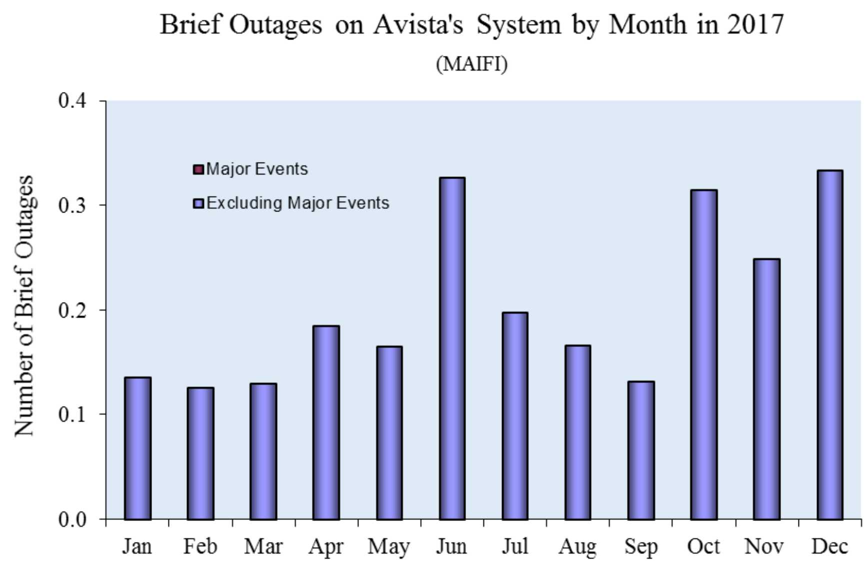
Figure 24. Number of Brief Outages (MAIFI) on Avista's Electric System 2005 – 2017.



The number of brief outages for 2017 was well above the prior-year result but was within the general range of those observed since 2011. Results since that time have remained substantially-below results from the period 2005-2010, which the Company believes resulted from our more intensive distribution vegetation management efforts implemented around 2005. The average for the current five-year period decreased slightly in 2017, compared with that of the previous five years.

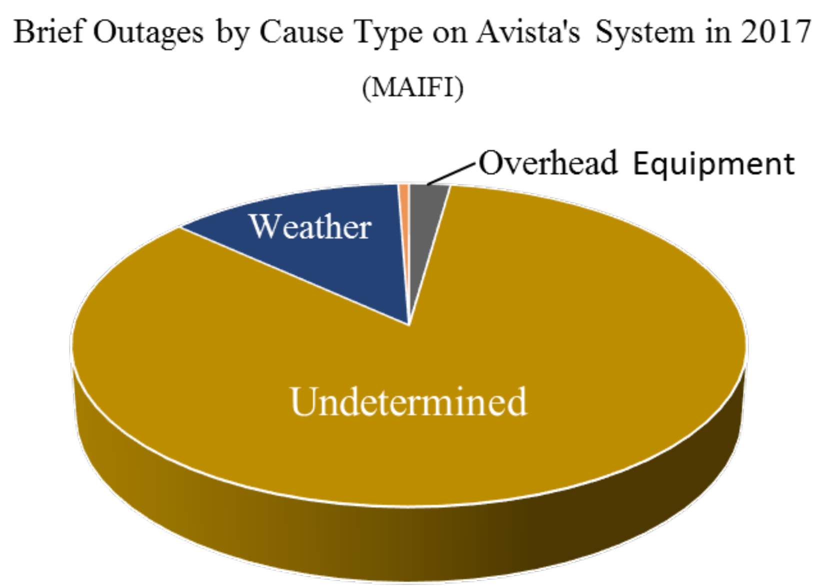
Brief Outages by Month – The figure below shown the monthly contribution to the number of brief outages on the Company's system in 2017.

Figure 25. Brief Outages by Month (MAIFI) on Avista's Electric System in 2017.



Brief Outages by Cause Type – Contribution to the number of brief outages by cause type for 2017 is shown in the figure below.

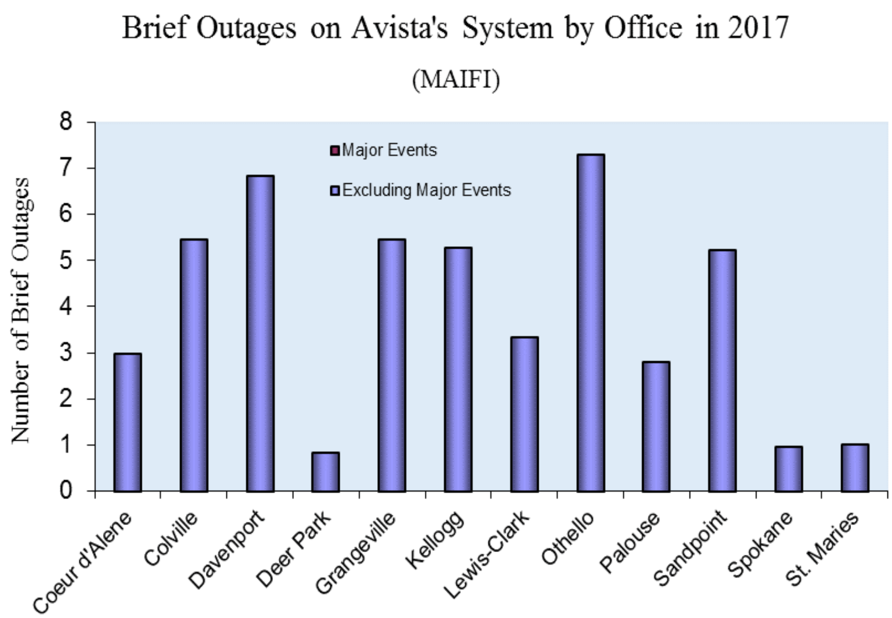
Figure 26. Number of Brief Outages (MAIFI) by Cause Type on Avista's Electric System in 2017.



Since brief outages are typically “cleared” by automated operations of the system,[69] most of the causes of the interruption are impossible to know, as reflected in the high percentage of “undetermined” cause types.

Brief Outages by Operating District – The figure below shown the geographic contribution to number of brief outages in the Company’s system by operations district in 2017. Of particular note are the relatively high number of outages for our more-remote districts compared with our more urban service areas.

Figure 27. Brief Outages by Operating District (MAIFI) on Avista’s Electric System in 2017.

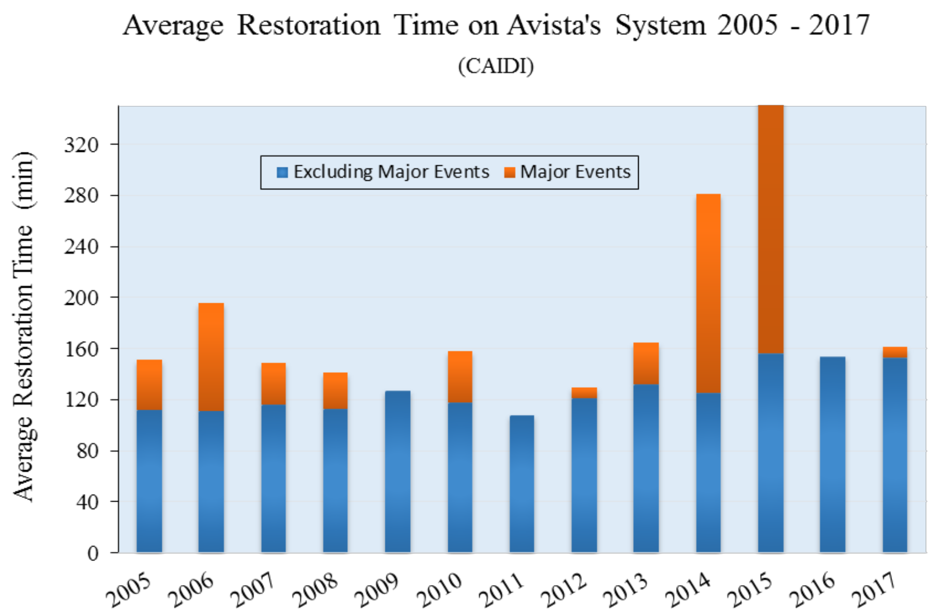


[69] A common automated operation of the system is known as a “trip-and-reclose.” This operation takes place when a fault on the line occurs, such as tree branch blowing from out of the right-of-way onto the line. The breaker will open for the fault but then automatically close the line back into service, often removing the fault (burning off the branch) in the process.

Restoration Time (CAIDI)

Historic Performance – The figure below presents the average outage restoration time on the Company's system from 2005 – 2017, reflecting both the total number of outages with and without those associated with major event days.

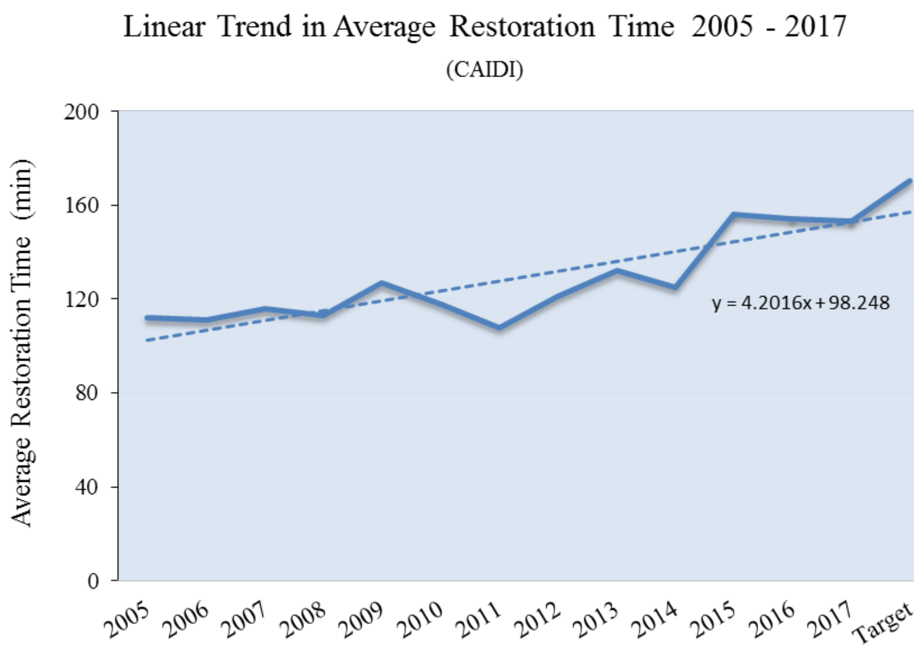
Figure 28. Average Restoration Time (CAIDI) on Avista's Electric System 2005 – 2017.



The average restoration time for 2017 was relatively unchanged from the prior-year result but was still among the three highest values measured on the Company's system since 2005. The average for the previous five years increased by over six minutes in 2017 for a current-period average of 144 minutes. This increasing value for customer restoration time, as reflected in the trend line figure below, generally corresponds with the increasing value for our overall system outage duration (SAIDI) discussed in the prior section.

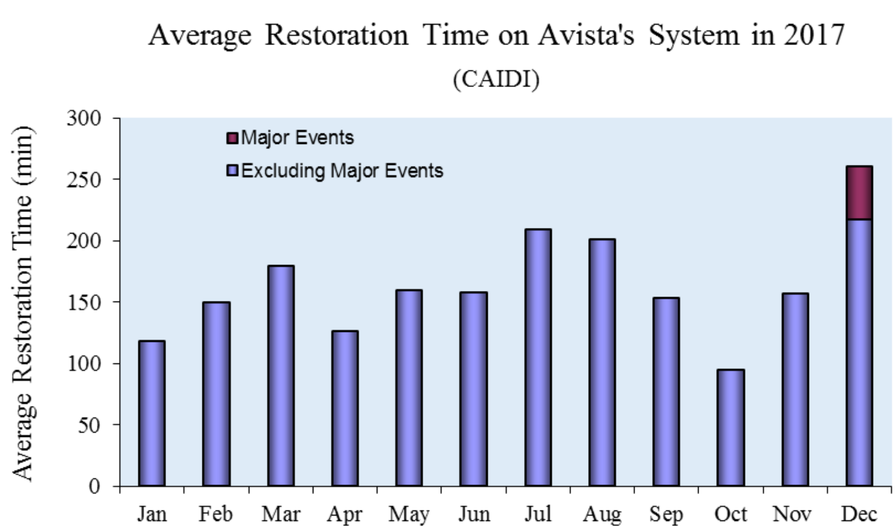
Overall Trend – The result for 2017 only slightly diminished the slope of the trend line from 2016, and did not impact the overall increasing trend in outage restoration time, as shown in the figure below. As noted above, better understanding the causes and implications of this overall pattern will be a focus of the Company going forward, particularly, in the context of reliability strategy and planning.

Figure 29. Linear Trend for Average Restoration Time (CAIDI) on Avista's Electric System 2005 – 2017.



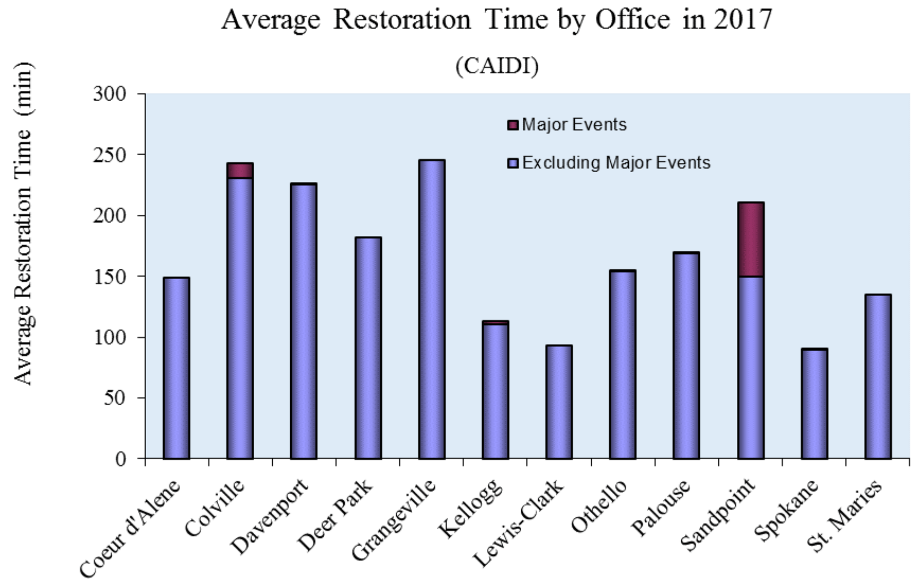
Outage Restoration Time by Month – The figure below shows the monthly contribution to number of outages on the Company's system in 2017. For the months of highest contribution, results in March were impacted by the incidence of failure in overhead equipment and pole fires, July and August by planned outages for work on the system and trees, and December principally by weather and overhead equipment failures.

Figure 30. Average Restoration Time (CAIDI) by Month on Avista's Electric System in 2017.



Number of Outages by Operating District – The figure below shows the geographic contribution to number of outages in the Company's system by operations district in 2017. Of particular note are the relatively high restoration times for our more remote districts.

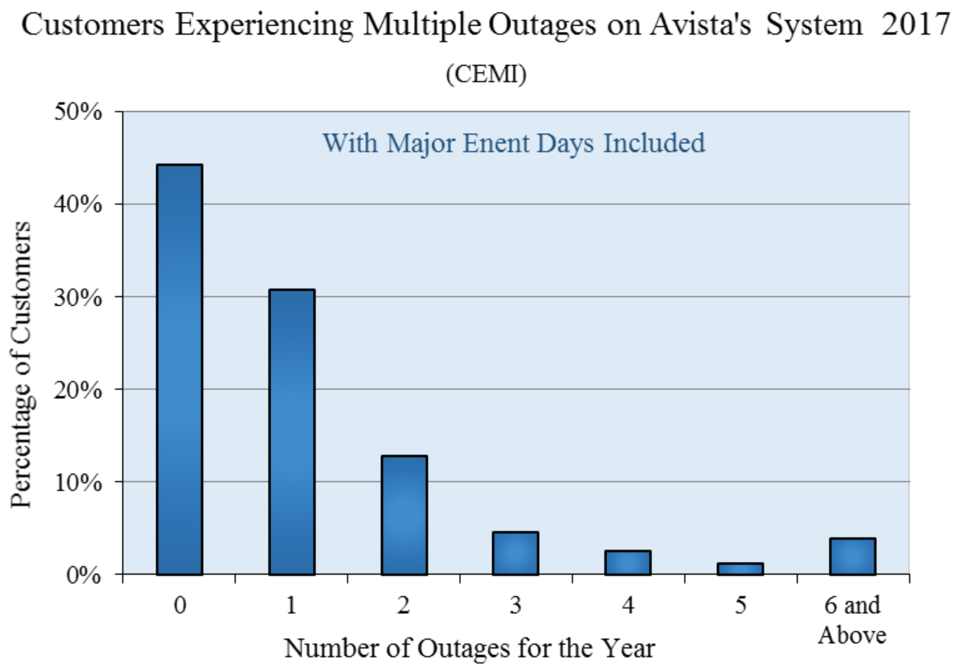
Figure 31. Average Restoration Time by Operating District (CAIDI) on Avista's Electric System in 2017.



Multiple Outages (CEMI)

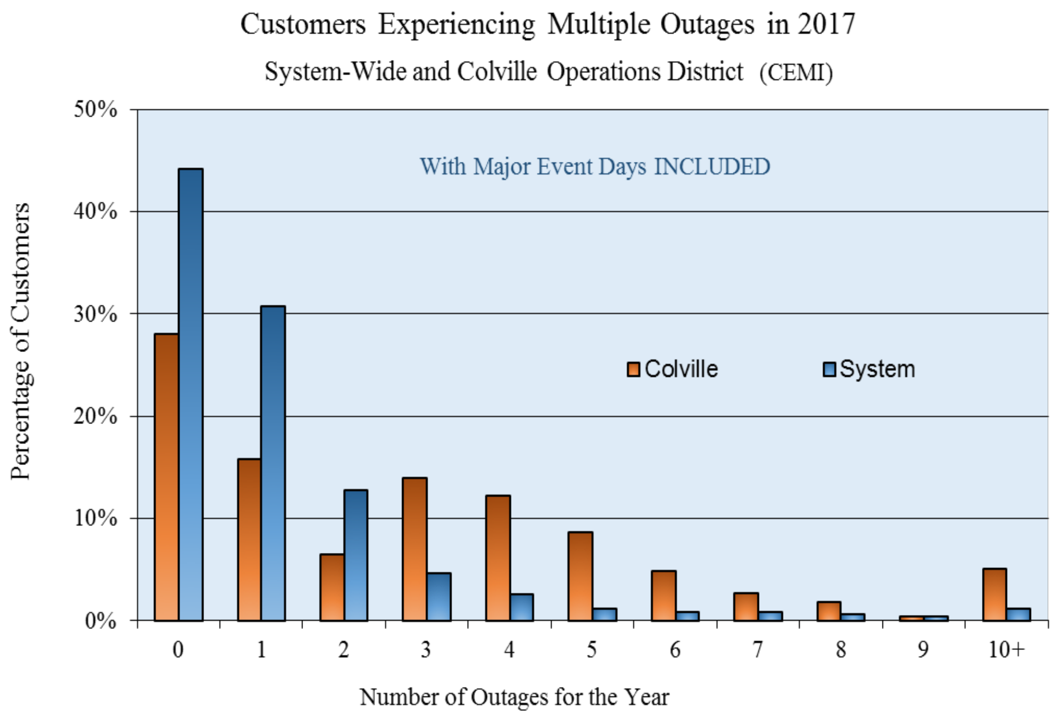
Results for 2017 – The figure below shows the distribution of all outages per customer (including those associated with major event days) on the Company's system for 2017. Nearly 45% of our customers experienced no sustained outages for the year, while just over 30% experienced a single outage. Slightly less than 13% of our customers experienced two service outages, while 4.6% had three outages for the year.

Figure 32. Percentage of Customers Experiencing Multiple Outages (CEMI) on Avista's Electric System in 2017.



Variation Across Our System – The figure below shows customers experiencing multiple outages (CEMI) for our entire electric system, compared with the same measure for our customers in the Colville operations district.

Figure 33. Percentage of Customers Experiencing Multiple Outages (CEMI) on Avista's Overall Electric System and the Colville Operations District in 2017.



Though not representing our entire system, this comparison shows the degree of difference our customers can experience among our more rural and remote operating districts. Notable in this figure is the number of customers in Colville who experience three and more outages per year compared with the overall system results. In Colville in 2017, approximately 50% of our customers had three or more sustained service outages during the year, while for the entire system, the comparable incidence was just under 12%.

Appendices

Appendix A - Definitions

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

"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.

"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.

"Electric Service Reliability" - The continuity of electric service experienced by retail customers.

"*Electric System Reliability Reporting Requirements*" – The minimum reporting requirements are as follows:

> *(1) The report must be consistent with the electric service reliability monitoring and reporting plan filed under WAC 480-100-393. As set forth in the plan, in an identified year, baseline reliability statistics must be established and reported. In subsequent years, new reliability statistics must be compared to the baseline reliability statistics and to reliability statistics from all intervening years. The utility must maintain historical reliability information necessary to show trends for a minimum of seven years.*
>
> *(2) The report must address any changes that the utility may make in the collection of data and calculation of reliability information after initial baselines are set. The utility must explain why the changes occurred and explain how the change is expected to affect comparisons of the newer and older information. Additionally, to the extent practical, the utility must quantify the effect of such changes on the comparability of new reliability statistics to baseline reliability statistics.*
>
> *(3) The report must identify the utility's geographic areas of greatest reliability concern, explain their causes, and explain how the utility plans to address them.*
>
> *(4) The report must identify the total number of customer complaints about reliability and power quality made to the utility during the year, and must distinguish between complaints about sustained interruptions and power quality. The report must also identify complaints that were made about major events.*

"Full-system" - All equipment and lines necessary to serve retail customers whether for the purpose of generation, transmission, distribution or individual service.

"Interruption Cause Code" – Used to describe the cause of an interruption (i.e., animal, tree, public, etc…).

"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.

"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.

"Power Quality" – Characteristics of electricity, primarily voltage and frequency, that must meet certain specifications for safe, adequate and efficient operations.

"*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.

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

Appendix B - Index 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
- = $\frac{\sum N_i}{N_T}$

$MAIFI_E$ – Momentary Average Interruption Event Frequency Index

- The average number of momentary interruption events per customer
- = The number of customers which had ***momentary interruption events*** / 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 $MAIFI_E$ using momentary events. The event includes all momentary interruptions occurring within 5 minutes of the first interruption. For example, when an automatic interrupting device opens and then recloses two, or three times before it remains closed, it is considered a single event.

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).

$$T_{MED} = e^{(a + 2.5\ b)}$$

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.

When an event has reached the threshold to constitute a MED described in subpart (f) above, all outage incidents associated with the MED will be flagged in the Company's Outage Management Tool. As the Company further assesses damage in the field while making repairs, new subsequent outage incidents that were a result of the MED may be created as more accurate information is made available. The subsequent incidents will be flagged and included as part of original outage event and MED.

Avista's Methodology for Calculating CEMI

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. Data can be exported to MS Excel to also create graphs representing different values of n. The calculation for $CEMI_n$ and Customers Experiencing Multiple Sustained and Momentary Interruptions $CEMSMI_n$ is provided in Attachment B.

Avista has used the data from the OMT system integrated with the GIS system to geospatially display reliability data for specific conditions. The specific conditions imply looking at the number of sustained interruptions for each service point (meter point). This would be similar to the SAIFI index, but would be related to a certain number of sustained interruptions. Avista includes all sustained interruptions including those classified under Major Event Days. This provides a view of what each customer on a specific feeder experiences on an annual basis. Momentary Interruptions are not included in the $CEMI_n$ index because by IEEE definition only applies to sustained outages. Other Momentary Indices are not included because of the lack of indication at many rural substations and line locations.

Appendix C - Methods and Measures

WAC 480-100-398 (2) requires the Company to report changes made in data collection or calculation of reliability information after initial baselines are set. This section addresses changes that the Company has made to data collection.

Data Collection

Since Avista's Electric Service Reliability Monitoring and Reporting Plan was filed in 2001 (UE-011428), 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 2016 represents the tenth full year of outage data collected through the Outage Management Tool (OMT). For 2016, 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.

Avista discovered a software coding error that has been within the OMT system since 2002 that caused a small increase in the SAIDI and CAIDI for 2008. Previous years were also evaluated to determine the overall impact to the Avista baseline statistics and at this time Avista is not proposing a change to the baseline numbers. The software error only occurred during very specific outage conditions when a group of customers with an initial outage starting time were "rolled" up into another group of customers that were determined to be part of the first group outage. The second group may have had a later outage starting time. When the first group of customer outage information was rolled up, the original outage starting time was lost and the second group outage starting time was used for both groups of customers instead of using the first outage starting time. The number of customers was counted correctly.

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.

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 above discussion.

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.

Appendix D - Areas of Greatest Concern

As in previous years, our Colville operations district continues to have the greatest reliability challenges in our Washington service area. Reliability there, however, continues to show improvement as targeted work there has been accomplished over several years. Within the Colville area, four feeders were identified as the Areas of Concern in prior years. Additionally, one feeder in the Spokane area and one in the Palouse area have also been identified in prior years as feeders of concern. These are Gifford 34F1, Gifford 34F2, Colville 34F1, and Spirit 12F1 in the Colville Area, Colbert 12F2 in the Spokane area, and East Colfax 222. The Colbert and East Colfax feeders were added to the list in 2016, and no feeders were added for 2017.

Listed below is a summary of the specific cause data for each of these feeders. This is a compilation of data from the Avista outage management tool (OMT) and the reporting from our local servicemen to Distribution Dispatch. Data from the reporting system is shown as a percentage of total customer outage hours for that feeder.

Colville 34F1

ANIMAL	4.2%
COMPANY	0.8%
PUBLIC	5.0%
TREE	5.0%
UNDETERMINED	37.8%
WEATHER	7.6%
EQUIPMENT OH	14.3%
EQUIPMENT UG	3.4%
PLANNED	21.8%

Colbert 12F2

ANIMAL	51.6%
PUBLIC	3.2%
TREE	9.7%
UNDETERMINED	3.2%
WEATHER	9.7%
EQUIPMENT OH	12.9%
PLANNED	9.7%

East Colfax 222

ANIMAL	8.6%
PUBLIC	8.6%
TREE	8.6%
UNDETERMINED	5.7%
WEATHER	2.9%
EQUIPMENT OH	5.7%
PLANNED	60.0%

Gifford 34F1

ANIMAL	9.1%
COMPANY	3.6%

POLE FIRE	3.6%
PUBLIC	1.8%
TREE	12.7%
UNDETERMINED	16.4%
WEATHER	12.7%
EQUIPMENT OH	16.4%
PLANNED	23.6%

Gifford 34F2

ANIMAL	2.5%
COMPANY	7.4%
PUBLIC	4.9%
TREE	14.8%
UNDETERMINED	13.6%
WEATHER	17.3%
EQUIPMENT OH	6.2%
EQUIPMENT UG	2.5%
PLANNED	30.9%

Spirit 12F1

ANIMAL	4.4%
COMPANY	0.9%
PUBLIC	5.3%
TREE	8.8%
UNDETERMINED	8.8%
WEATHER	7.0%
EQUIPMENT OH	4.4%
EQUIPMENT UG	1.8%
PLANNED	58.8%

Colville Operations District Work Plans – Improvement work accomplished or planned for historically low-reliability feeders in the Colville area is briefly described below. The Company's reliability working group is continuing to study these feeders to develop additional work as appropriate. Each of the identified feeders also had planned outages that correspond to the maintenance and replacement activities in the area.

Gifford 34F1

- Storm damage to lines led an effort to reconductor sections to 2/0 ACSR in 2012.
- A recloser was installed to allow for better sectionalizing between the northern and southern sections of the feeder during outage events.
- $167k was spent in 2014 to replace two miles of overhead distribution line with underground cable.
- $250k was spent to reconductor two miles of overhead distribution line in 2015.
- Existing feeder was split into two separate feeders in 2017.

Gifford 34F2

- Approximately 3,000 feet of overhead conductor was replaced in 2010, and the remaining 5,000 feet was replaced in 2012.
- Special vegetation management work trimmed 651 trees and removed 867 problem trees in 2011.
- $167k was spent in 2014 to reconductor two miles of overhead distribution lines.
- $250k was budgeted to reconductor two miles of overhead distribution lines in 2017.

Colville 34F1

- Vegetation Management crews removed 59 trees as unplanned work on this circuit in 2011. A line clearance crew completed Risk Tree mitigation work on this circuit in 2012.
- $100k was spent in 2011 to replace outage-prone overhead sections with underground cable.
- $62k was spent to install wild life guards in 2011. Approximately 65% of the Colville 12F1 feeder was completed in 2011. Remaining work was completed in 2012.
- $250k was spent in 2013 to replace overhead line sections with underground cable to reduce tree exposure.
- $50k was spent in 2013 to install a recloser to allow for better outage sectionalizing.
- $250k was budgeted to reconductor two miles of overhead distribution line in 2017.

Spirit 12F1

- This feeder was part of the Grid Modernization program in 2014. Additional Grid Modernization work on this feeder was scheduled to take place in 2016. Three reclosers were added in 2017 as part of completing the grid modernization process.

Appendix E - Historic Major Event Days on Avista's System

The following table is provided as an initial review of Major Event Day information. The main premise of the IEEE Major Event Day calculation is that using the 2.5b method should classify 2.3 days each year as MED's. The following table shows the previous major event days, the daily SAIDI value and the relationship of the yearly T_{MED}.

Table 4 – Yearly Summary of the Major Event Days

Year	Date	SAIDI	T_{MED}
2004	05-21-2004	7.11	6.35
	08-02-2004	7.36	
	12-08-2004	31.00	
2005	06-21-2005	39.53	4.916
	06-22-2005	9.03	
	08-12-2005	19.60	
2006	01-11-2006	12.10	7.058
	03-09-2006	8.58	
	11-13-2006	30.79	
	12-14-2006	29.26	
	12-15-2006	158.31	
2007	01-06-2007	9.98	8.017
	06-29-2007	32.64	
	07-13-2007	12.79	
	08-31-2007	21.30	
2008	01-27-2008	17.57	9.224
	07-10-2008	36.74	
	08-18-2008	9.49	
2009	None		9.925
2010	5/3/2010	21.04	11.110
	11/16/2010	68.67	
2011	None		10.848
2012	1/19/2012	9.93	9.489
	12/17/2012	14.35	
2013	8/25/2013	24.97	8.956
	8/26/2013	11.78	
	9/15/2013	14.01	
	11/16/2013	11.09	
2014	7/23/14	92.95	8.719
	7/24/14	35.66	
	8/25/14	121.05	
	8/3/14	38.52	
	8/12/14	9.84	

2015	8/29/15	13.42	8.219
	9/30/15	9.99	
	11/17/15	2093.19	
	11/18/15	399.34	
	11/19/15	147.97	
	11/20/15	66.96	
	11/21/15	47.30	
	11/22/15	32.61	
	11/23/15	15.38	
	11/24/15	12.19	
	12/23/15	29.35	
	12/24/15	19.24	
2016	None		10.171
2017			10.189

Appendix F - Interruption Cause Codes

Cause code information is provided in this report to give readers a better understanding of outage sources. Further, the Company uses cause information to analyze past outages and, if possible, reduce the frequency and duration of future outages.

Since 2011, Avista has stopped using the subcategory "protected" under the "Animal" category. Almost all birds are considered protected, so there is little differentiation between the "Bird" and "Protected" subcategories. Avista will include additional information in the Remarks section as reported from the field personnel. .

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

	Transformer - OH Wildlife Guard	
EQUIPMENT UG	URD Cable - Pri URD Cable- Sec Connector - Sec Elbow Junctions Primary Splice Termination Transformer - UG Other	Outages caused by equipment failure. Specific equipment called out in sub category.
EQUIPMENT SUB	High side fuse Bus Insulator High side PCB High side Swt / Disc Lowside OCB/Recloser Low side Swt / Disc Relay Misoperation Regulator Transformer Other	
MISCELLANEOUS		For causes not specifically listed elsewhere
NOT OUR PROBLEM (*Outages in this category are not included in reported statistics*)	Customer Equipment 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 TREE UNDETERMINED	Maintenance / Upgrade Forced Tree fell Tree growth Service Weather	Outage, normally prearranged, needed for normal construction work. Outage scheduled to repair outage damage. 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. 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.

Appendix G - Avista Service Quality Measures Report Card

2017 Service Quality Measures Report Card

Customer Service Measures	Benchmark	2017 Performance	Achieved
Percent of customers satisfied with our Contact Center services, based on survey results	At least 90%	93.6%	✓
Percent of customers satisfied with field services, based on survey results	At least 90%	95.2%	✓
Number of complaints to the WUTC per 1,000 customers, per year	Less than 0.40	0.16	✓
Percent of calls answered live within 60 seconds by our Contact Center	At least 80%	81.5%	✓
Average time from customer call to arrival of field technicians in response to electric system emergencies, per year	No more than 80 minutes	39.9 Minutes	✓
Average time from customer call to arrival of field technicians in response to natural gas system emergencies, per year	No more than 55 minutes	50.29	✓

Electric System Reliability	5-Year Average (2013-2017)	2017 Result	Change in 5-Year Average
Frequency of non-major-storm power interruptions, per year, per customer	1.05	1.2	+0.01
Length of power outages per year, per customer	151 Minutes	183 Minutes	+9 Minutes

Customer Service Guarantees	Successful	Missed	$$ Paid
Electric & Natural Gas service appointments	1,584	11	$550
Electric outage restoration within 24 hours of notification from Customer, excluding major events	30,669	23	$1,150
Switch on power within one business day of request	9,557	0	$0
Provide cost estimate for new electric or natural gas supply within 10 business days	3,929	0	$0
Investigate and respond to billing inquiries with 10 business days	1,623	0	$0
Investigate customer-reported problems with a meter, or conduct a meter test, and report results within 20 business days	1082	1	$50
Provide notification at least 24 hours in advance of disconnecting service for scheduled electric interruptions	17,079	115	$5,750
Totals	**65,523**	**150**	**$7,500**

2017 Performance Highlights

As in our prior year of service, Avista once again achieved all six of its Customer Service Measures for 2017. Among several improvements in service we reported this year was a substantial improvement in meeting our customer guarantee commitments. In 2016, the Company missed a total of 365 individual commitments our of 68,830 qualifying events, and paid our customers a total guarantee amount of $18,250. For 2017 our missed commitments were nearly 60% lower than in 2016 and the total guarantee amounts totaled $7,500. Our electric system reliability in 2017 reflected an increase in storm-related outages over the prior year, which mainly impacted the average duration of outages on our system. Our five-year average value for duration of service outages increased by nine minutes in 2017. Avista is anticipating it will more-formally evaluate its current electric system reliability strategy and planning in 2018, and plans to describe any key findings and forward plans in its 2018 Customer Service Quality and Electric System Reliability Plan report to be filed in April 2019.