

RE 61 e-FILING REPORT COVER SHEET

REPORT NAME:

2015 Service Quality Measure Annual Report

COMPANY NAME:

Portland General Electric

DOES REPORT CONTAIN CONFIDENTIAL INFORMATION?

No

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RE (Electric)

Report is required by:

OPUC Order No. 11-160, (amended Order No. 97-196 (UM 814))

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If known, please select the PUC Section to which the report should be directed:

Electric Rates and Planning



Portland General Electric 2015 Service Quality Measure Report

SERVICE QUALITY MEASURE ANNUAL REVIEW

Review of Safety and Operational Performance Areas

Portland General Electric submits this annual report pursuant to OPUC Order 97-196 as later amended to provide information on the service quality of the Company. The information addresses Service Quality Performance Measures on the following:

- C1 “At Fault” customer complaint frequency
- R1 Average customer interruption duration
- R2 Average customer interruption frequency
- R3 Average momentary interruption frequency
- R4 Annual service restoration
- X1 Vegetation Management program
- X2 Pole and overhead facilities inspection, testing and maintenance program
- X3 Other Programs (Marina inspection and maintenance)

In addition to the reporting on the above stated service quality performance measures, and to provide a fuller picture of PGE’s service quality, PGE has included in this report since 2008, additional information we call 21st Century Service Quality Indicators. These 21st Century Service Quality Indicators are included in an Appendix to this report and provide information on the following: customer satisfaction, system reliability and NESC safety violations.

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2015 Annual Review of Safety and Operational Performance Areas

A. Relentless Safety at PGE

PGE is committed to providing a safe and healthy place of business for employees, customers, and the general public. Safety is a core value that is integrated into everything we do. No job we do, nor service we perform, is so urgent that we cannot take the time to perform the job safely. PGE conducts operations that meet or exceed compliance with all applicable laws, regulations and company standards; strive to continually improve our overall safety and health performance; and transparently communicate our progress.

Most hazards can be identified and effectively controlled or eliminated to prevent incidents and their consequences. We identified critical safety components of our daily work and provide training and work practices for employees, including *PGE's Safety Rules to Live By* (where applicable) which are:

1. Wear appropriate arc flash personal protective equipment (PPE).
2. Follow all electrical safety testing and grounding rules.
3. Follow approachable working clearance/cover rules.
4. Follow all fall protection rules.
5. Follow all lock out/tag out rules and procedures including hazardous energy source isolation and dissipation requirements.
6. Follow confined space and enclosed space entry requirements.

Our safety efforts are managed and monitored through the PGE's Safety Management System. The primary purpose of PGE's Safety Management System is to provide a tool that reduces the risk of occupational injuries and incidents and improves safety performance. The Safety Management System provides a systematic approach to managing safety planning, implementation, measurement, with a focus on our value of continuous improvement. Additionally, this system provides guidance to methodically manage safety risks, opportunities and impacts across the company. It is also designed to impart a consistent approach and provide a common platform that is sustainable while establishing the standard for implementing the PGE Safety and Health Policy.

Corporate oversight is provided through the Executive Safety Council (ESC). The Council provides safety oversight for the company and our customers. Their commitment to relentless safety provides direction to the various workgroups and is able to align resources needed to address safety issues. The Officers and senior management representatives on the ESC meet with employee groups to hear safety concerns and to share information on safety initiatives. The ESC helps eliminate barriers that can impede our work on safety. We strive to provide visible management commitment to safety and support each other to achieve our vision of an injury-free work place.

It is essential to have every employee committed to and actively participate in our safety goals. Leaders and employees are expected to embrace and support safety programs; actively hold themselves and those working with them accountable to follow safety rules, policies, and guidelines; recognize co-workers of all levels for their efforts to model and improve our safety performance and culture; and be a safety role model. Leaders also work to effectively lead, promote, and influence their team to achieve a sustainable injury-free workplace.

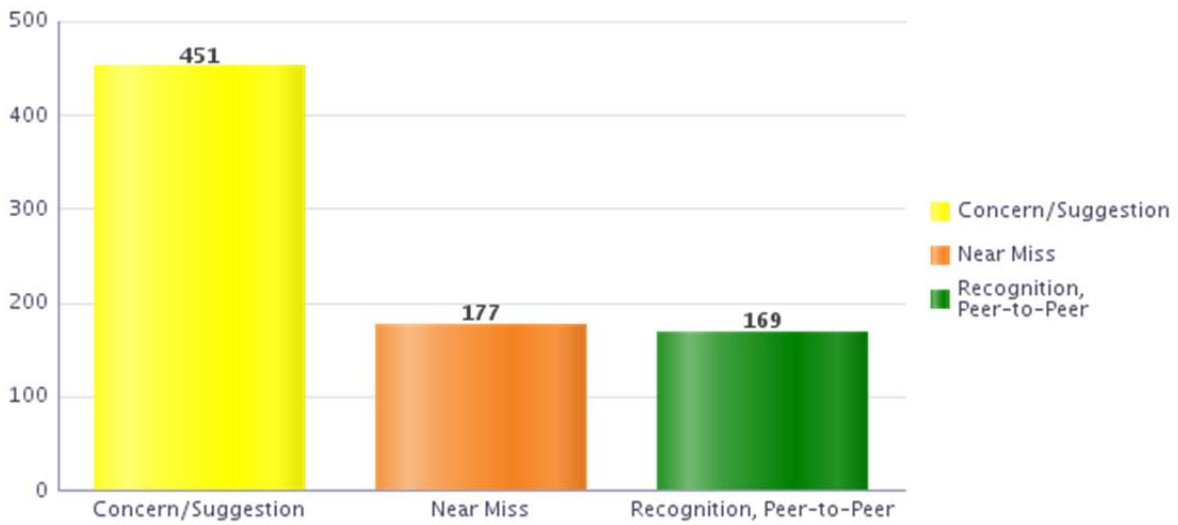
We have a variety of employee supported safety programs including our safety committees, SHARP, VPP programs, and Grassroots Safety teams. These programs leverage the experience of the frontline workforce to identify hazards and work to correct them. Eliminating physical hazards, improving work procedures, and understanding regulatory compliance are key components of employee efforts in these programs. Their success builds each year and is part of the foundation of our safe work environment.

Public safety is another important part of our business. We focus on identification, development, implementation and communication of programs and materials designed to provide awareness of potential electrical hazards that can cause significant danger, injury, harm or compromise to the safety of our employees and the general public. Outreach and safety around electricity awareness is conducted to prevent and protect the public from injuries involving our electrical equipment. We pursue strategic partnerships and conduct outreach activities with key at-risk groups such as fireman, agricultural workers, tree trimmers, construction workers, and school age children to increase understanding of electrical safety issues.

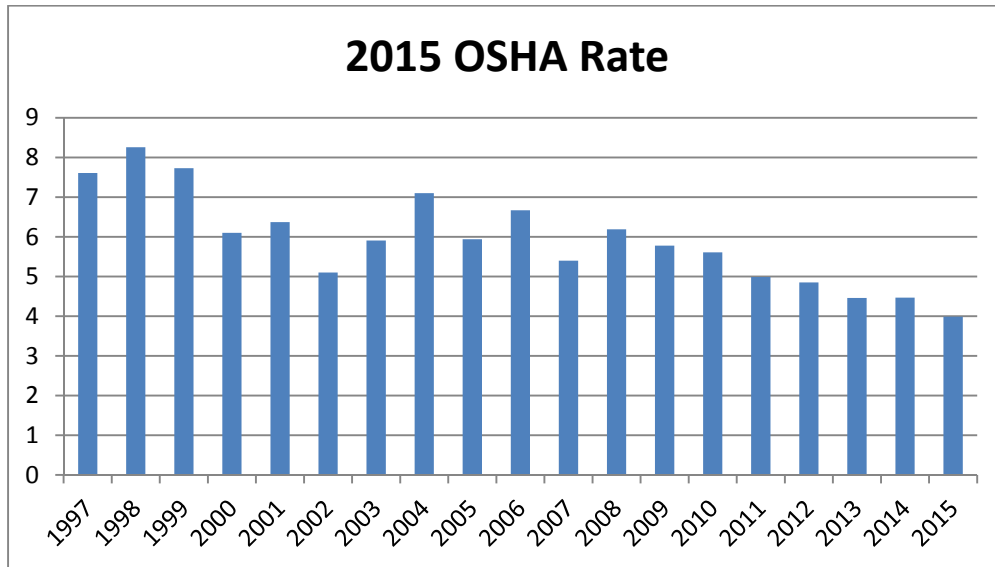
We track a variety of leading and lagging indicators to gauge our improvements. The diagrams on the following page are two examples of the data we track and communicate to all employees. Employee engagement in safety continues to improve and our focus on relentless safety is reflected in improvements in our safety culture, employee participation, and employees going home without injury at the end of each day.

LEADING INDICATORS FOR 2015

Event Count by Type



2015 OSHA Rate



B. Performance Measures C-1 Customer “At-Fault” Complaint Frequency

Customer Complaints and Customer Service Measures

In 2015, PGE’s OPUC Liaisons fielded 203 customer complaints, a decrease from 236 complaints in 2014. Of these, the OPUC determined 20 “At-Fault” designations resulting in PGE’s 2015 total At-Fault Complaint rate per 1,000 customers. PGE meticulously reviews all At-Fault complaints for root cause and lessons learned.

Year	Logged Complaints	Total Customers	At Faults	At Fault Frequency
2011	254	822,466	14	0.0170
2012	208	828,354	12	0.0146
2013	282	836,070	16	0.0191
2014	236	842,273	5	0.0059
2015	203	852,164	20	0.0234

C. Reliability Performance Measures: R1-SAIDI, R2-SAIFI, R3-MAIFI, R4-CAIDI

Executive Summary

This executive summary provides an overview of the 2015 Reliability Report and highlights key information with comparisons to past years’ data. If there are any questions about this information, please call Rob Weik at (503) 464-8131.

a. 2015 Reliability

The three year weighted average for SAIDI, SAIFI, and MAIFI indices in 2015 were 80.5 minutes, 0.59 occurrences, and 1.12 occurrences respectively. The three-year weighted averages for all of PGE’s reliability indices are below the OPUC thresholds for system performance (see Table 1), but are reflecting an increasing trend. A primary contributor to this trend, specifically in 2014 and 2015, is the increase in frequency of short duration (24-48 hour) storms impacting PGE’s service territory.

The five-year average service availability for Portland General Electric customers is 99.986%. Service availability in 2015 was 99.986%.

Continued efforts in 2016 will improve system reliability by focusing on the poorest performing feeders and tap lines, putting processes in place to reduce the length of major outages and investigating outage causes that are trending up.

b. Summary of Reliability Indices

Table 1 below, provides a 10-year summary of the PGE's reliability indices (excluding Major Event Days) and shows that PGE's three-year system average stayed below the OPUC SAIDI, SAIFI, and MAIFI Level 1 and 2 threshold limits in 2015.

NOTE: A day is designated as a Major Event Day when the daily system SAIDI exceeds a threshold value, T_{MED} . PGE utilizes the IEEE Standard 1366 methodology to calculate the T_{MED} value. In 2015, March 15th, August 29th, November 17th 18th, December 8th -9th, and December 21st were designated as Major Event Days.

TABLE 1
10-YEAR SUMMARY OF RELIABILITY INDICES
(EXCLUDING MAJOR EVENT DAYS)

Year	SAIDI (minutes)	SAIFI (occurrences)	MAIFI (occurrences)	CAIDI (minutes)	Number of outages
2015	75	0.48	1.2	156	6,613
*2014	96	0.70	1.4	135	5,834
*2013	61	0.45	0.9	136	4,495
2012	72	0.55	1.1	131	5,093
2011	66	0.51	0.9	129	4,535
2010	77	0.65	1.1	118	5,454
2009	115	0.81	1.4	142	6,354
2008	75	0.73	1.3	103	5,817
2007	77	0.71	1.3	109	5,994
2006	117	1.06	1.6	110	6,930
2005	86	0.83	1.6	104	5,560
2004	85	0.80	1.8	106	5,582
2003	82	0.80	2.1	103	5,366
3-Year Weighted Average for 2015	78.2	0.54	1.2	146.2	N/A
OPUC Goal	90	1.0	3		
Level 1 Penalty	105	1.2	5	N/A	N/A
Level 2 Penalty	115	1.4	7		

*System performance values for 2013 and 2014 reflect the corrected values as described in PGE's supplemental filing for PGE 2013 and 2014 Service Quality and Annual Reliability Reports filed 8.26.15.

The following methods/exclusions were used to derive PGE's 2015 system reliability indices:

1. The three-year weighted averaging formula was calculated with 2015 weighted at 50%, 2014 weighted at 30%, and 2013 weighted at 20%.
2. Excluded from SAUDI and SAIFI calculations are:
 - All outages of five minutes or less Outage causes reported as Non-outage: Telco Wire, Cable TV Wire, Verizon Equipment, Qwest Equipment, or Comcast Equipment

c. Underperforming Feeder Summary

PGE feeders are classified as Urban, Rural, or Remote and have established performance thresholds (see Appendix for details). Feeders with indices greater than or equal to the defined feeder classification thresholds are designated as underperforming.

A 10-year summary of PGE's underperforming feeders is shown below in Table 2. The number of underperforming feeders is displayed by year and filtered by reliability index and total. Of PGE's 580 feeders, 9 (1.6%) have been underperforming for the last three consecutive years and 29 (5.0%) have been underperforming for two out of the last three years.

**TABLE 2
10-YEAR SUMMARY OF UNDERPERFORMING FEEDERS**

Year	Number of Underperforming Feeders (by index)				Total Underperforming Feeders ²
	SAIDI	SAIFI	MAIFI	MAIFI ONLY ¹	
2015	79	23	24	19	101
2014	109	44	16	13	127
2013	53	19	10	7	63
2012	58	24	11	11	76
2011	56	29	11	12	61
2010	78	37	11	7	91
2009	124	44	25	12	136
2008	59	34	16	12	80
2007	71	35	25	17	96
2006	114	86	24	15	143
2005	76	49	33	27	111
2004	67	45	40	26	104
2003	77	45	51	36	116

¹ Designates the feeders underperforming only for the MAIFI threshold and no other index thresholds (i.e. SAIDI and SAIFI). This column was added to show the benefit of tracking MAIFI on more feeders every year.

² A feeder can be underperforming for more than one index. Feeders that fall in multiple underperforming indices are only captured once in the *Total Underperforming Feeders* value.

d. Worst SAIDI Days

Table 3 displays the top 10 days with most significant impact to SAIDI in 2015 (NOTE: Major Event Days are excluded). The ranking is based on the total number customer outage minutes for the day and associated contribution to SAIDI. These 10 days made up 22% of the total customer minutes in 2015 and contributed 16 minutes to the 2015 system SAIDI value.

**TABLE 3
10 WORST DAYS FOR SAIDI IN 2015
(EXCLUDING MAJOR EVENT DAYS)**

Rank	Date	Customer-Outage Minutes	Minutes Contributed to SAIDI Total	Outage Cause
1	12/7/2015	1,975,612	2.28	Vegetation
2	12/1/2015	1,553,404	1.79	Vegetation
3	2/9/2015	1,458,705	1.68	Weather
4	8/30/15	1,415,943	1.63	Weather
5	12/10/2015	1,405,881	1.62	Vegetation
6	1/18/2015	1,380,072	1.59	Vegetation
7	12/2/2015	1,362,336	1.57	Vegetation
8	5/18/2015	1,283,040	1.48	Loss of Supply-Substation
9	10/31/2015	1,124,277	1.29	Loss of Supply-Transmission
10	7/16/2015	1,099,908	1.27	Equipment

D. X1 - Vegetation Management Program

1. **Description:** The Vegetation Management Program is a Basic Maintenance Program that is set apart from the other inspection and maintenance programs due to the crucial effect trees can have on system safety and reliability. Trees and other vegetation are trimmed or removed to provide line clearance and prevent system damage. The Vegetation Management personnel count is a valuable early warning indicator to alert Staff of the Company's ability to adequately maintain its system.
2. **Understanding:**
The Company acknowledges that "tickling," "brushing" contacts, brown leaves, desiccation, or any other descriptions, or results of, direct or arcing contact with primary conductors is interpreted by Staff as interference.
3. **PGE Quality Control:**
The Company shall inspect not less than 10% of recently completed tree trimming on a continuous basis to ensure compliance with the Program Plan and achievement of adequate clearance. PGE Foresters monitor all trimming projects on a continual basis using QA performance logs for each project.
4. **Program Expenditures:**
The Annual Report will contain information showing the Company's actual annual expenditures compared with its previously planned expenditures. Information will include total budget with actual versus budgeted for each of the following elements: Maintenance Cycle Trimming, Customer Assistance Trimming, Line Construction Trimming, and PGE Supervision and Administration.

Budget Plan and Actual Expenditures:

	<u>Actual</u>	<u>Budget</u>
2014 Actual versus budgeted:	\$13,450,480	\$13,746,624
2015 Actual versus budgeted:	\$14,441,214	\$14,144,036
• PGE Supervision and Administration:	\$ 677,230	
• Maintenance Cycle Trimming:	\$13,547,741	94%
• Customer Assistance Trimming :	\$ 722,061	5%
• Line Construction Trimming:	\$ 144,412	1%

5. Vegetation Management Personnel Information:

The Company's Annual Report shall include the number of full time employees assigned to the following positions for each of the last three years:

	2015	2014	2013
a) Company foresters:	8	8	8
b) Company tree trimmers and arborists; and	0	0	0
c) Contractor tree trimmers and arborists.	99	95	95

E. Performance Measure X2 Pole & Overhead Facilities Inspection, Testing, and Maintenance Program

Summary of Program

The year 2015 was our 9th year of the Facility Inspections and Treatment to the National Electrical Safety Code (FITNES) III 10-year cycle. 2015 FITNES overhead inspection and treatment was performed on 29,714 distribution and transmission poles and associated overhead distribution facilities (11% of 270,000 wood poles included in the FITNES Overhead Program).

a. Corrections of Violations Discovered During Inspections

- FITNES Program timelines are established and maintained to perform corrections, repairs, or replacement work within two (2) years of violation discovery. 13,000 violations were corrected in 2015.
- Violations deemed an immediate hazard receive expedited attention to ensure treatment/correction within 30 days.

b. PGE Quality Control

- Accuracy of the inspection is ensured by performing QC on a random sampling pulled on average weekly.
- QC was also performed on 1,605 corrected violations (12.3% of total 13,000 corrections).

c. Inspection Program Expenditures

- 2015 Pole and Overhead Facilities Inspection, Testing and Pole Treatment: \$1,026,000 (Budget) \$939,000 (Actual).

d. All PGE OH FITNES Program Expenditures

	2015	
	Budget	Actuals
Pole and OH Facilities Inspection, Testing, & Treatment	\$1,026,000	\$939,000
Pole and OH Facilities Repair (O&M)	\$1,284,000	\$1,087,400
Pole Replacements (Capital)	\$1,022,000	\$735,500

e. 2016 FITNES Plans

PGE plans to complete the Cycle 3 FITNES plan for Pole and OH Inspections and inspect approximately 28,000 poles and related OH facilities in 2016.

F. Performance Measure X3 - Other Programs

Marina Inspections

Forty seven Marinas were inspected this quarter. One Marina was found to have violations. All inspection reports were entered into Maximo and forwarded to the appropriate region for resolution.

The following are violations reported, but not corrected since 2013:

M1452510	Low Drop	Reported Oct 2014
M1406718	Low Drop & Tight TX	Reported April 2013
M1412317	Numerous Minor Repairs	Reported April 2013
M1429546	B/O Primary Conduit	Reported April 2014
M1457278	Raise TX	Reported November 2014
M1457281	Raise TX	Reported November 2014

PGE New Construction Quality Assurance Program

PGE QA's

1. 92 poles inspected involving new pole installations inspected in Q1 of 2015
2. 0 violations were found
3. Violations per pole was 0.0%

PGE Safety Survey for inspection of imminent danger of Overhead System

Safety Surveys

1. 38 Townships are in the 2015 cycle
2. 30% were inspected in Q1 of 2015
3. One Work Order created and forwarded to Region to fix B/O conduit.
4. 20 double poles reported on Safety Survey forwarded to UAM to review.

Maximo

In 2014, CS&I went to bid on 250 jobs with a total bid amount of \$5.9 million.

This averages 62 jobs per quarter and \$1.5 million per quarter.

Q1 of 2015 we have bid 13 jobs with a total bid amount of \$206,000.

Appendix

21st Century Service Quality Indicators

1. Customer Survey Data

PGE collects survey data from Residential, Business and Large Industrial (Key) customers to measure and evaluate how customers perceive its performance across several areas including:

- Reliability and Power Quality
- Customer Service
- Management
- Communications
- Pricing
- Corporate Citizenship
- Billing and Payment

The surveys reveal relative strengths and weaknesses in the Company's performance as well as opportunities for improvement.

PGE contracts with Market Strategies International (MSI), an independent, full-service customer market research company headquartered in Michigan, to conduct customer satisfaction surveys among PGE's residential and general business customers.

Each quarter, MSI surveys 400 to 600 residential customers and every other quarter, (Q2 and Q4) they survey 300-400 general business customers. They analyze and benchmark the collected data and provide PGE with quarter-to-quarter and year-to-year comparisons based on the "percent total positive" (%6-10) scores on an 11-point scale (where 0 represents "*Extremely Dissatisfied*" and 10 means "*Extremely Satisfied*"). According to the fourth-quarter 2015 MSI survey, PGE received a positive rating on overall satisfaction for both residential and business customers, placing it in the top quartile for residential and business customers.

In addition, PGE also acquires the results of the annual J.D. Power and Associates Electric Utility Customer Satisfaction StudySM (J.D. Power Study) for both residential and general business customers. PGE uses the J.D. Power Study primarily as a benchmark to other electric utilities. In 2015, PGE ranked 6th among the top 94 investor-owned utilities in the nation for residential customer satisfaction. In 2015, PGE ranked 2nd among utilities in the West for business customer satisfaction by J.D. Power & Associates.

For its large industrial customers (key customers), PGE contracts with TQS Research, Inc. (TQS), an independent market research firm, to conduct annual customer satisfaction surveys. TQS, headquartered in Georgia, specializes in business-to-business research among the largest energy users in the United States and Canada. For 2015, TQS completed 71 PGE key customer interviews and benchmarked the data against the results of 49 U.S. utility holding companies. TQS uses a 10-point scale (with 1 being *Very Dissatisfied* and 10 being *Very Satisfied*) and reports the percent of customers that give a rating of 8, 9, or 10 (%8-10).

In the 2015 TQS research, PGE ranked 9th nationally in overall customer satisfaction and 6th in reliability with large key customers, placing it in the top quartile among electric utility holding companies.

2. Ranking Methodology:

National and/or peer comparison groups are not identical for MSI, J.D. Power and TQS research results, but there is some overlap in the utilities surveyed. In 2014, MSI included approximately 100 utilities serving residential customers and approximately 90 utilities serving business customers in their national databases. J.D. Power surveyed about 140 utilities for its residential study and about 100 utilities for its general business study. For both MSI and J.D. Power, PGE compares itself to all surveyed utilities and to a sub-set defined as a “peer group.” The TQS national comparison database contains 49 utilities and compares performance with respect to key customers only.

Utilities in the peer comparison groups for PGE are shown in the tables below for MSI, J.D. Power and TQS.

PGE’s 2015 MSI Survey peer groups

Residential	Business
NV Energy North	NV Energy North
NV Energy South	NV Energy South
Pacific Gas & Electric	Pacific Gas & Electric
Pacific Power	Pacific Power
Portland General Electric	Portland General Electric
Puget Sound Energy	Puget Sound Energy
Rocky Mountain Power	Rocky Mountain Power
San Diego Gas & Electric	San Diego Gas & Electric
Seattle City Light	Southern CA Edison
Southern CA Edison	

PGE's 2015 J.D. Power Study Peer Groups

Residential	Business
APS	APS
L. A. Dept. of Water & Power	L.A. Dept. of Water & Power
NV Energy	NV Energy
Pacific Gas and Electric	Pacific Gas and Electric
Pacific Power	Pacific Power
Puget Sound Energy	Puget Sound Energy
Rocky Mountain Power	Rocky Mountain Power
San Diego Gas & Electric	San Diego Gas & Electric
SMUD	Southern California Edison
Southern California Edison	SRP
SRP	Xcel Energy-West
Xcel Energy-West	

2015 TQS National Utility Benchmark Study of Large Key Accounts

Top 20 of 49 Holding Companies
Berkshire Hathaway
Southern Co
We Energies
OG&E
Consumers
WPS
FP&L
SCE&G
PGE
Duke Energy
PPL Corp
AEP
Xcel
Entergy
TVA
DTE
Texas Utilities
San Diego Gas & Electric
CenterPoint
Avista Corp

3. Customer Satisfaction Results:

➤ Survey Question & Result

MSI:

Survey Question: “Based on your overall experience as a customer of PGE, how would you rate the company on a 0-10 scale, where a 0 means you are extremely dissatisfied and 10 mean you are extremely satisfied?”

TQS:

Survey Question: “Overall, how satisfied are you with the full package of electrical services provided by your local utility?” See PGE Customer Satisfaction results below.

PGE Customer Satisfaction Rolling Average Results

	MSI: Residential (%6-10)	MSI: General Business (%6-10)	TQS: Key Customers (%8-10)
2015	89%	90%	83.1%
2014	88%	94%	90.5%
2013	90%	94%	90.9%
2012	86%	94%	93.9%
2011	86%	92%	90.5%
2010	86%	94%	81%
2009	85%	92%	72%
2008	85%	94%	82%
2007	83%	92%	75%
2006	82%	92%	76%
2005	81%	93%	64%
2004	80%	87%	58%

Year End 2015 Rank on Customer Satisfaction

National	15th/111	25 th /98	9 th /49
Peers	3rd/10	2nd/9	NA

4. System Reliability Results:

➤ Survey Question and Results

MSI:

Survey Question: “Thinking about the overall reliability of electric service to your [home/business], on a 0-10 scale, where 0 means you are extremely dissatisfied and 10 means you are extremely satisfied, how satisfied are you with the overall reliability of electric service?”

TQS:

Survey Question: “Overall how satisfied are you with the reliability of electric power?”

PGE System Reliability Rolling Average Results

Year End 2015 Rank on System Reliability

	MSI: Residential (%6-10)	MSI: General Business (%6-10)	TQS: Key Customers (%8-10)
2015	84%	98%	90.1%
2014	96%	96%	91.7%
2013	97%	96%	96.6%
2012	96%	96%	97.6%
2011	95%	98%	88.4%
2010	95%	95%	95.7%
2009	94%	98%	86.6%
2008	95%	96%	86.2%
2007	94%	95%	85%
2006	95%	94%	88%
2005	94%	94%	83%
2004	93%	91%	71%
Year End 2014 Rank on System Reliability			
National	5th/110	4th/97	6th /49
Peers	2nd/10	1st/9	NA

5. Safety Results – Note: Safety Not asked in 2014 for Residential Survey

MSI:

Survey Question: “Using this same 0-10 scale, how would you rate PGE in terms of helping customers use electricity safely in their [homes/businesses]?”

PGE Safety

	Residential (MSI)	General Business (MSI)
	(%6-10)	(%6-10)
2015	Not asked	87%
2014	Not asked	80%
2013	Not asked	85%
2012	80%	80%
2011	76%	83%
2010	75%	79%
2009	76%	70%
2008	76%	64%
2007	77%	70%
2006	79%	67%
2005	74%	62%
2004	74%	60%

6. PGE Feeder Classification Criteria:

- Urban – 50% or more of the feeder load is located inside the Urban Growth Boundary (UGB)
- Rural – One or more of the following apply:
 - a. Load is greater than 0.5 MVA per square mile
 - b. More than 100 customers per square mile
 - c. Serving load inside an incorporated city
 - d. Directly adjacent to the UGB with feeder ties into the UGB
- Remote – Not classified as Urban or Rural

7. PGE Feeder Classification Performance Thresholds:

Feeder Classification	SAIDI (minutes)	SAIFI (occurrences)	MAIFI (occurrences)
Urban	120	2.0	5
Rural	300	2.6	10
Remote	420	2.6	15

8. IEEE 2.5 BETA Method

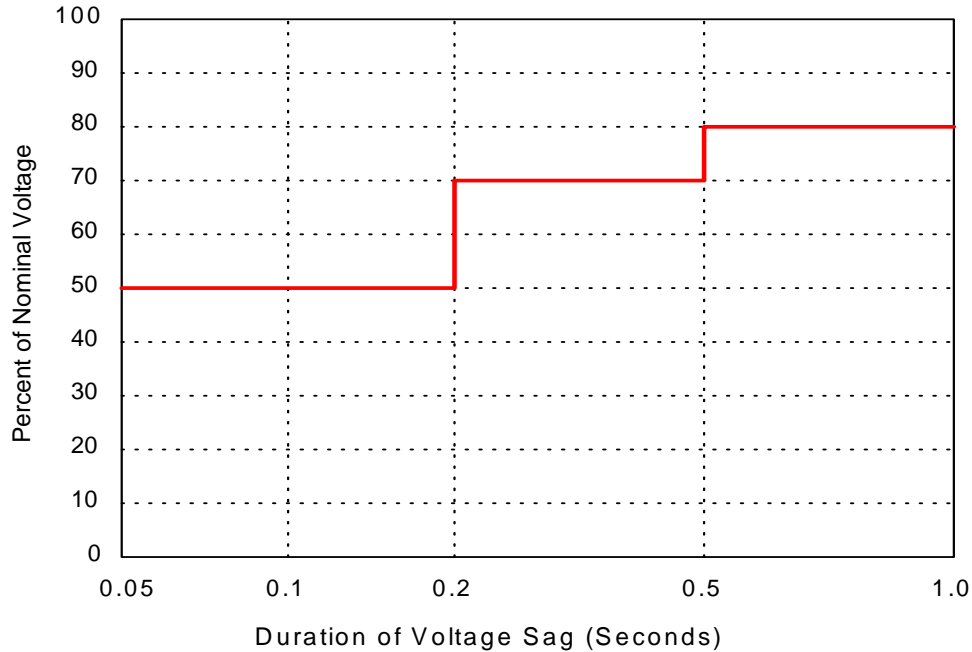
The 2.5 Beta Method looks at the Daily SAIDI values of a utility and compares them to a threshold value (T-MED) obtained by performing a logarithmic distribution analysis on the previous 5 years of outage data. Calculating a T-MED value allows the utility to identify and study days in which the distribution system experienced stresses beyond what is observed under daily operation. Per IEEE Standard 1366-2003 the steps to obtain major event day threshold (T-MED) are outlined below.

IEEE GUIDE FOR ELECTRIC POWER DISTRIBUTION RELIABILITY INDICES	IEEE Std 1366-2003
<p>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.</p> <p>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).</p> <p>c) Take the natural logarithm (ln) of each daily SAIDI value in the data set.</p> <p>d) Find α (Alpha), the average of the logarithms (also known as the log-average) of the data set.</p> <p>e) Find β (Beta), the standard deviation of the logarithms (also known as the log-standard deviation) of the data set.</p> <p>f) Compute the major event day threshold, T_{MED}, using equation (25).</p> $T_{MED} = e^{(\alpha + 2.5 \beta)} \quad (25)$ <p>g) Any day with daily SAIDI greater than the threshold value T_{MED} that occurs during the subsequent reporting period is classified as a major event day.</p> <p>Activities that occur on days classified as major event days should be separately analyzed and reported.</p>	

Since OPUC, PGE, Pacific Corp., and Idaho Power have collaborated on incorporating the IEEE-2.5 Beta method for calculating Major Event Days into Oregon's Electric Service Reliability Rules. The new rules became affective January of 2012.

9. SARFI

System Average RMS Variation Frequency Index (SARFI) represents the average number of RMS sag events experienced by a customer over a time period, where the disturbances are those with a magnitude less than the semiconductor equipment voltage sag ride-through capability curve specified in SEMI F47-0200 (below).



The Semiconductor Equipment and Materials International (SEMI) developed the SEMI F47-0200 standard for semiconductor process equipment voltage sag immunity. The standard specifies minimum voltage sag ride-through requirements of semiconductor processing equipment. A voltage sag event is defined as a short term decrease in voltage (10 - 90% of nominal) ranging between 0.5 cycles and one minute. Voltage sags can be caused by bad weather, tree into line, car hit pole, failed equipment on PGE's system, or events originating outside PGE's system.

In 2015, PGE's Large Customer Quality and Reliability Program (QRP) tracked voltage sag events against the SEMI F47 curve for 25 customers who have unique power quality and reliability requirements.

The PGE Quality and Reliability Program (QRP) is a focused effort to provide a high level of service reliability to a group of customers determined to have unique reliability needs. The QRP program includes monitoring and reporting of power quality and reliability metrics for 26 customer sites and customers located within our three Reliability Areas. These Reliability Areas are Downtown Salem Core, Hillsboro-Sunset, and Downtown Portland Network.

Additional objectives of the QRP Program include:

- working with stakeholders to review the facilities serving QRP customers and identify potential system improvements
- developing detailed maintenance plans including enhanced system inspections and testing.
- managing implementation of identified capital improvements
- performing root cause investigations and identifying preventive actions for significant reliability events

Through this effort, PGE is providing a higher level of service excellence to meet the service quality and reliability needs of an increasingly sophisticated and demanding customer base.

Events below the curve are considered a SARFI event.

SARFI is calculated using the following formula:

$$SARFI = \sum \frac{\text{Total Number of Events}}{\text{Total Number of Customers}}$$

The 2015 SARFI results reflect 16 events.

Year	SEMI F47 (occurrences)	SEMI F47 (occurrences originating inside PGE system)	SARFI (total)	SARFI (originating inside PGE system)
2015	16	15	0.62	0.58

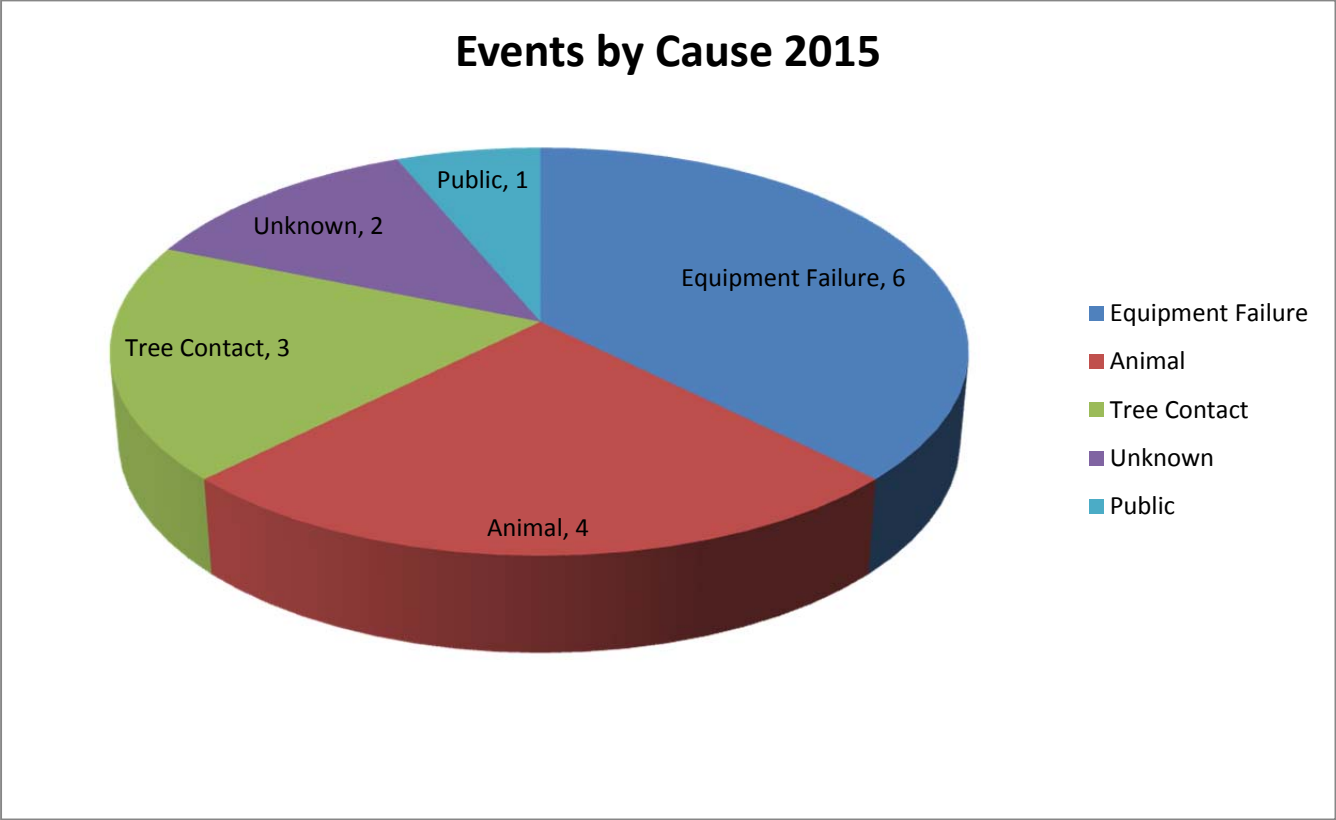
10. Summary of 2015 SARFI SEMI results

* % Sag is the percentage of nominal voltage remaining during event

# of Customers	Event Date	Duration	Worst Case Voltage	Description of Event	Follow-Up
5	3/6/15	3.25 Cycles	49.70%	Reactor Fire at Keeler BPA substation.	None required.
1	4/19/15	29.42 Cycles	23.04%	Switch 8373 failed on Sunset-Blanchet.	Switch replaced.
1	5/23/15	4.44 Cycles	23.04%	Squirrel contact on Urban-Kelly.	None required.
1	5/24/15	29.63 Cycles	13.44%	Cutout failure on Brookwood-Borwick.	Replaced cutouts and installed cross arm.
1	6/14/15	1.68 Cycles	37.43%	Squirrel contact on Urban-Barbur	None required.
1	7/9/15	16.2 Cycles	1.99%	UG Conductor Failure on Urban-Gibbs feeder.	None required.
1	7/13/15	37.08 Cycles	41.24%	Tree limb on Harmony-Milwaukie feeder.	IR scan resulted in the replacement of two fused cutouts.
1	8/11/15	4.8 Cycles	43.79%	Broken side stack insulator on PACW 115 kV line caused line contact on PGE distribution feeder.	None required.

# of Customers	Event Date	Duration	Worst Case Voltage	Description of Event	Follow-Up
1	8/29/15	8.76 Cycles	43.05%	OH conductor failure on Stephens-11001 feeder.	None required
1	9/13/15	1.32 Cycles	44.85%	Squirrel contact on Urban-Barbur feeder.	None
1	10/31/15	6.84 Cycles	8.68%	Tree limb on Harmony-Milwaukie feeder.	None required
1	11/12/15	27.46 Cycles	28.84%	Underground Dig-in on Sunset-Cornell	Cable repaired
1	11/17/15	1.3 Seconds	10.32%	Tree limb on Harmony-Milwaukie feeder.	None required
1	12/10/15	4.8 Cycles	41.92%	Unknown, Lightning in area.	None required
1	12/10/15	6.96 Cycles	18.46%	Broken side stack on Chemawa-Salem 57 kV caused feeder lockout on Indian-Keizer	None required
1	12/21/15	18.48 Cycles	36.92%	Fault on Liberty-Morningside caused trip and reclose on Hillcrest-Liberty 115 kV	None required

The graph below represents the sources for the 16 SARFI events which occurred in 2015:



11. 2015 NESC Violations

Starting in 1999 a random sample of newly constructed poles have been inspected by trained personnel looking for any National Electrical Safety Code NESC violations. The results are reviewed with Line Crew Management from the region of the work as well as with the Line crew who built the violation. They are then responsible to make the appropriate corrections confirmed by further inspection.

Steady progress has continued. Increased connection between qualified NESC inspectors and Foreman during construction has enhanced embedded learning for the crews along with ongoing NESC Foreman development program. The result reduced VPP from .05 violations per pole in 2014 on 320 selected poles. In 2015, 270 poles were selected and the violations per pole lowered to .019 on work done by PGE crews.

PGE brought an increased number of contract line crews on the property. 52 jobs that required construction design were inspected as part of their performance measurement. A violation per job was calculated to be @ .04.

* Table shows NESC inspection results of work done by PGE crews on jobs requiring new pole construction





		ABANDONED ANCHOR	BUILDING CLEARANCE	B/O GROUND	CONDUIT DAM/BRKTS	CLEARANCE PEDESTRIAN	CLIMBING SPACE	GROUND ROD	WH.CLEAR	GUY BONDING	GUY SLACK	INSULATOR BROKEN	WIRE OFF INSULATOR	STRUCTURE CLEARANCE	LOOSE WIRE	RISER GROUNDING	SECONDARY CLEARANCE	DRIVEWAY CLEARANCE	AG CLEARANCE	POLE-COM CLERANCE	ROAD CLEARANCE	RAILROAD CLEARANCE	SERVICE ATTACHMENT	MIDSPAN COM CLEARANCE	SERVICE CLEARANCE	VERTICAL CLEARANCE	TOTAL VIOLATIONS	VIOLATIONS PER POLE	
REGION	POLES	AH	BC	BG	CD	CP	CS	DG	DL	GI	GS	IB	IW	LC	LW	MR	NC	OC	OG	PC	RC	RR	SA	SC	SD	VC			
PSC	36				1		1								1		2											5	0.139
ORE CITY	23																											0	0.000
EASTERN	54																											0	0.000
SOUTHERN	0																											0	0.000
WESTERN	157																											0	0.000
TOTAL	270	0	0	0	1		1	0	0	0	0			0	1	0	2	0	0	0	0	0	0	0	0	0	5	0.019	

PGE SERVICE TERRITORY

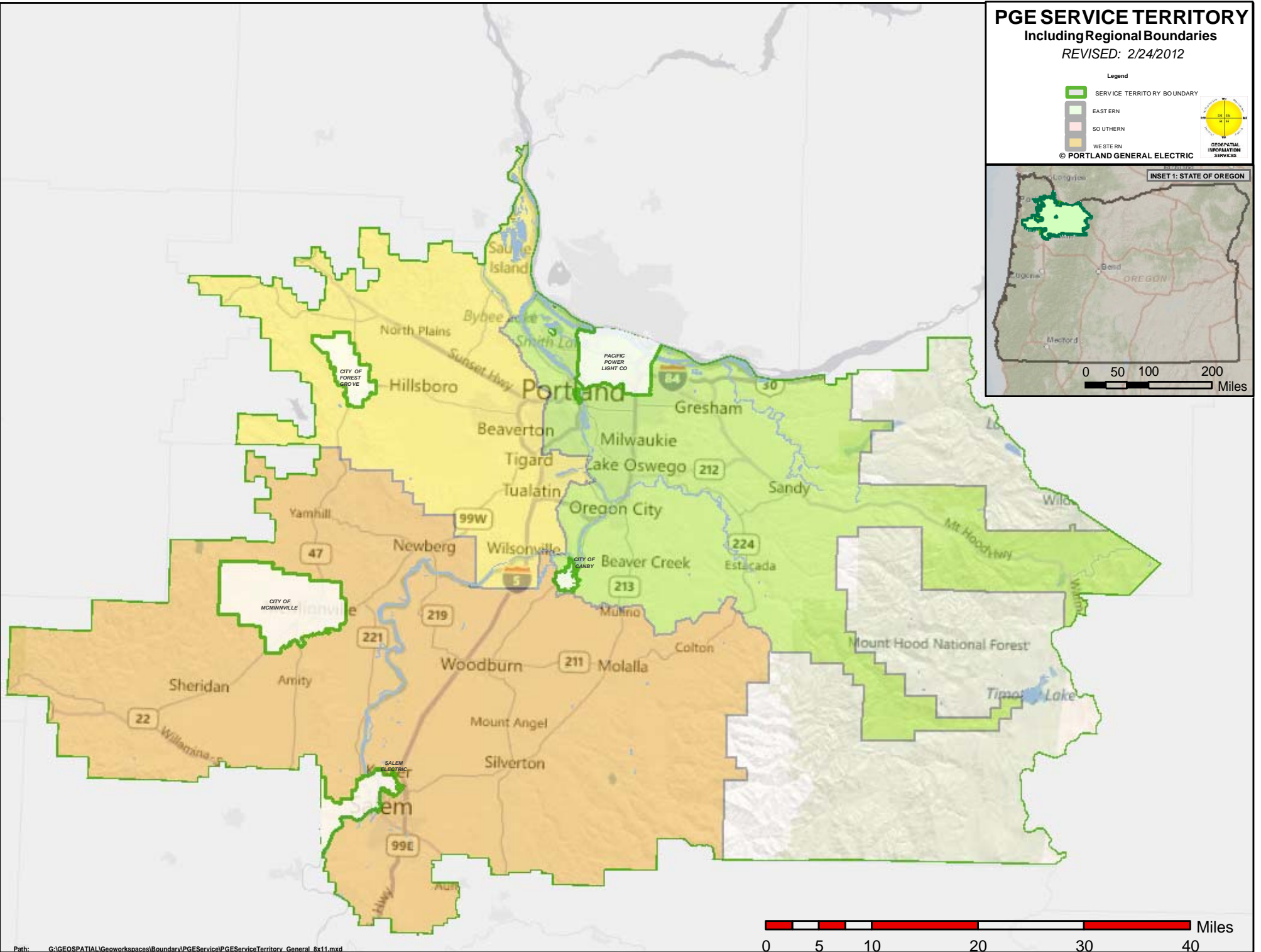
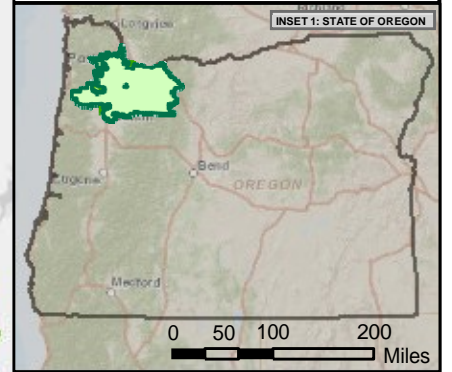
Including Regional Boundaries

REVISED: 2/24/2012

Legend

-  SERVICE TERRITORY BOUNDARY
-  EASTERN
-  SO U THER N
-  WESTERN

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PortlandGeneral.com

April 29, 2016

Public Utility Commission of Oregon
Attn: Filing Center
201 High Street SE
P.O. Box 1088
Salem, OR 97308-1088

RE: PGE 2015 Service Quality Measure (SQM) Annual Report

Pursuant to Order No. 11-160, which amended Order No. 97-196 (UM 814), PGE hereby submits, the 2015 Service Quality Measure Annual Report. This report covers the service quality performance of PGE in 2015. Per the terms of Order 11-160, the PGE Master Agreement, which includes the revised PGE Service Quality Measures, expires December 31, 2016. Accordingly, this annual report is the final report submitted pursuant to the Order.

Should you have any questions regarding this filing, please contact Terri Bowman at (503) 464-8854 or Mary Widman at (503) 464-8223.

Please direct all formal correspondence and requests to the following email address pge.opuc.filings@pgn.com

Sincerely,

A handwritten signature in black ink that reads "Karla Wenzel". The signature is written in a cursive, flowing style.

Karla Wenzel
Manager, Pricing and Tariffs

Enclosure
Cc: Lori Koho, OPUC