



# Circuit Reliability Review

## **Palos Verdes Estates**

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January 2017

# Providing Safe, Reliable, and Affordable Power

Southern California Edison is modernizing the power grid to meet the changing needs and expectations of our customers and to help California achieve its clean energy goals.

We are investing more than \$12 billion into our power grid between 2015 – 2017 with the goal of increasing power reliability through significant upgrades. These investments include:

- Updating thousands of transmission and distribution poles
- Replacing hundreds of miles of underground cables
- Replacing hundreds of underground structures such as vaults and manholes
- Upgrading critical distribution equipment; capacitor banks, switches, and circuit breakers
- Building new distribution circuits to serve electrical demands in our communities
- Inspecting and replacing overhead conductor and equipment to improve public safety

Our investments in local communities will help ensure that customers receive safe, reliable, and affordable electricity now and in the future.

# Understanding Your Reliability Report

As your electric utility, we want you to always have power when you need it. To get there, we constantly track and monitor electric outages across our service territory, and we measure our “system reliability” from this data.

The two metrics we rely on are common in the electric utility industry: the System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI). Both are described in more detail on the next page.

Replacing and upgrading our infrastructure will help SCE maintain or improve SAIDI and SAIFI measurements.

This report provides historical reliability data for the circuits that serve your jurisdiction and our proposed infrastructure upgrades for the current year.

To view other reliability reports, visit [sce.com>Outage Center>Maintaining Reliable Service](https://sce.com/Outage-Center/Maintaining-Reliable-Service)

# Reliability Metrics

## MOMENTARY OUTAGES:

OUTAGES LASTING 5 MINUTES OR LESS

### MAIFI:

- The number of times the average customer is interrupted by Momentary outages each year.

## SUSTAINED OUTAGES:

OUTAGES LASTING LONGER THAN 5 MINUTES

### SAIFI:

- The number of times the average customer is interrupted by Sustained outages each year.

### SAIDI:

- The cumulative amount of time the average customer is interrupted by Sustained outages each year.

## Cities in the South Bay District

Alondra Park

Del Aire

El Segundo

Gardena

Hawthorne

Hermosa Beach

Inglewood

Ladera Heights

Lawndale

Lennox

Lomita

Los Angeles

Manhattan Beach

**Palos Verdes Estates**

Rancho Palos Verdes

Redondo Beach

Rolling Hills

Rolling Hills Estates

Torrance

View Park-Windsor Hills

West Athens

Westmont

# Reliability by SCE District (No Exclusions)

District Name	2012				2013				2014				2015				2016			
	District SAIDI	SAIDI RANKING	District SAIFI	SAIFI Ranking	District SAIDI	SAIDI RANKING	District SAIFI	SAIFI Ranking	District SAIDI	SAIDI RANKING	District SAIFI	SAIFI Ranking	District SAIDI	SAIDI RANKING	District SAIFI	SAIFI Ranking	District SAIDI	SAIDI RANKING	District SAIFI	SAIFI Ranking
ANTELOPE VALLEY	78.60	28	0.56	31	94.42	22	0.62	31	51.05	35	0.59	34	104.34	22	0.68	30	107.67	24	0.87	29
ARROWHEAD	129.58	13	1.31	7	180.59	7	1.39	8	193.25	5	1.59	5	362.61	4	3.97	1	659.46	3	2.85	5
BARSTOW	184.80	7	1.15	12	204.33	6	1.40	7	201.53	4	1.34	10	187.11	8	1.17	12	134.83	18	1.35	9
BIG CREEK	1184.25	1	4.52	1	176.51	8	3.08	1	920.25	1	1.34	11	422.77	2	3.42	2	1062.01	2	4.99	1
BISHOP	463.09	2	1.25	9	104.44	17	0.51	35	118.79	17	0.59	35	298.11	6	2.22	4	168.59	8	1.22	14
BLYTHE	225.88	6	1.53	3	483.13	1	1.38	9	707.54	2	2.42	2	427.00	1	1.52	7	396.38	5	2.71	6
CATALINA	78.46	30	0.72	29	105.94	16	2.97	2	97.02	24	4.17	1	42.56	35	2.25	3	65.01	35	3.66	3
COVINA	108.73	19	0.92	19	100.51	19	0.86	20	91.60	27	0.87	22	100.08	23	0.81	25	112.13	22	0.97	24
DOMINGUEZ HILLS	117.22	18	0.82	24	89.17	26	0.80	21	82.30	29	0.71	28	130.63	15	0.97	17	146.38	12	1.11	17
FOOTHILL	91.69	25	0.90	20	85.80	27	0.79	24	93.35	25	0.93	21	109.64	20	0.95	20	142.81	14	1.03	21
FULLERTON	68.99	33	0.42	35	90.57	25	0.79	22	82.23	30	0.72	27	76.59	29	0.67	31	92.72	30	0.76	34
HUNTINGTON BEACH	95.78	23	0.89	21	66.51	32	0.68	29	79.61	31	0.78	25	98.32	25	0.95	19	128.02	20	1.26	12
KERNVILLE	226.76	5	1.31	6	232.18	4	1.96	3	178.69	8	1.99	3	286.38	7	0.96	18	2421.32	1	3.67	2
LONG BEACH	75.83	31	0.55	33	75.11	30	0.70	28	66.33	34	0.61	32	164.46	9	0.89	23	135.16	17	0.86	31
MENIFEE	99.32	22	0.84	23	107.39	15	1.26	10	156.68	11	1.32	12	111.46	19	0.98	16	156.75	9	1.31	10
MONROVIA	108.11	20	1.13	15	99.12	20	1.02	16	133.32	14	1.16	16	96.68	26	0.88	24	116.57	21	0.84	32
MONTEBELLO	131.06	12	1.13	14	118.08	13	1.17	12	158.34	10	1.16	15	150.28	12	1.18	11	133.52	19	1.17	15
ONTARIO	93.09	24	0.87	22	77.39	29	0.79	23	97.91	23	1.00	19	94.04	27	0.74	27	105.07	27	0.93	27
PALM SPRINGS	175.92	8	1.27	8	112.80	14	0.77	25	107.04	20	0.71	29	99.54	24	0.80	26	107.58	25	1.07	19
REDLANDS	120.13	16	1.11	16	96.48	21	1.04	15	154.25	12	1.04	18	124.52	17	1.01	14	137.11	16	0.98	23
RIDGECREST	229.65	4	1.44	4	161.95	9	1.12	13	176.84	9	1.57	6	148.90	13	1.01	15	254.31	6	1.05	20
SADDLEBACK	83.01	27	0.73	27	70.69	31	0.53	34	99.07	22	0.74	26	46.03	34	0.39	35	65.99	34	0.65	35
SAN JOAQUIN	135.90	10	1.04	18	244.44	2	1.45	6	138.25	13	1.17	14	127.50	16	1.05	13	108.44	23	1.09	18
SANTA ANA	78.60	29	0.55	32	93.35	24	0.74	26	91.68	26	0.84	23	67.46	32	0.71	29	97.27	29	1.00	22
SANTA BARBARA	153.81	9	1.15	13	82.00	28	0.70	27	183.78	7	1.38	9	152.37	11	1.52	6	156.66	10	1.41	8
SANTA MONICA	101.69	21	0.79	25	122.78	12	1.00	17	110.76	19	0.99	20	75.41	30	0.62	32	91.08	31	0.95	26
SOUTH BAY	122.68	15	1.17	10	142.15	10	1.49	5	125.28	16	1.39	8	164.07	10	1.31	8	183.90	7	1.88	7
TEHACHAPI	117.96	17	1.43	5	232.67	3	1.12	14	130.70	15	1.29	13	298.96	5	1.21	9	97.29	28	1.13	16
THOUSAND OAKS	127.73	14	1.05	17	93.86	23	0.91	18	104.37	21	1.10	17	106.59	21	0.92	21	143.78	13	1.31	11
VALENCIA	62.01	35	0.46	34	51.04	34	0.53	33	79.23	32	0.61	33	72.27	31	0.61	33	105.09	26	0.97	25
VENTURA	134.81	11	1.15	11	100.52	18	1.21	11	183.79	6	1.65	4	148.85	14	1.19	10	150.41	11	1.24	13
VICTORVILLE	67.70	34	0.66	30	61.33	33	0.63	30	68.85	33	0.63	31	87.03	28	0.91	22	79.35	33	0.92	28
WHITTIER	72.60	32	0.74	26	135.04	11	0.86	19	87.60	28	0.70	30	114.52	18	0.73	28	137.34	15	0.81	33
WILDOMAR	88.54	26	0.72	28	40.51	35	0.56	32	118.49	18	0.81	24	52.70	33	0.60	34	84.01	32	0.87	30
YUCCA VALLEY	319.82	3	3.41	2	216.97	5	1.50	4	304.25	3	1.49	7	389.08	3	1.80	5	463.68	4	3.39	4
<b>SCE SystemWide</b>	<b>108.13</b>		<b>0.89</b>		<b>102.61</b>		<b>0.91</b>		<b>112.00</b>		<b>0.96</b>		<b>114.83</b>		<b>0.92</b>		<b>134.48</b>		<b>1.10</b>	

\*\*Exclusions\*\* are days which utilities are allowed to remove from their metrics because the outages on those days were caused by a severe acts of nature.

\*\*In the columns showing "Rank," lower numbers indicate poorer performance.

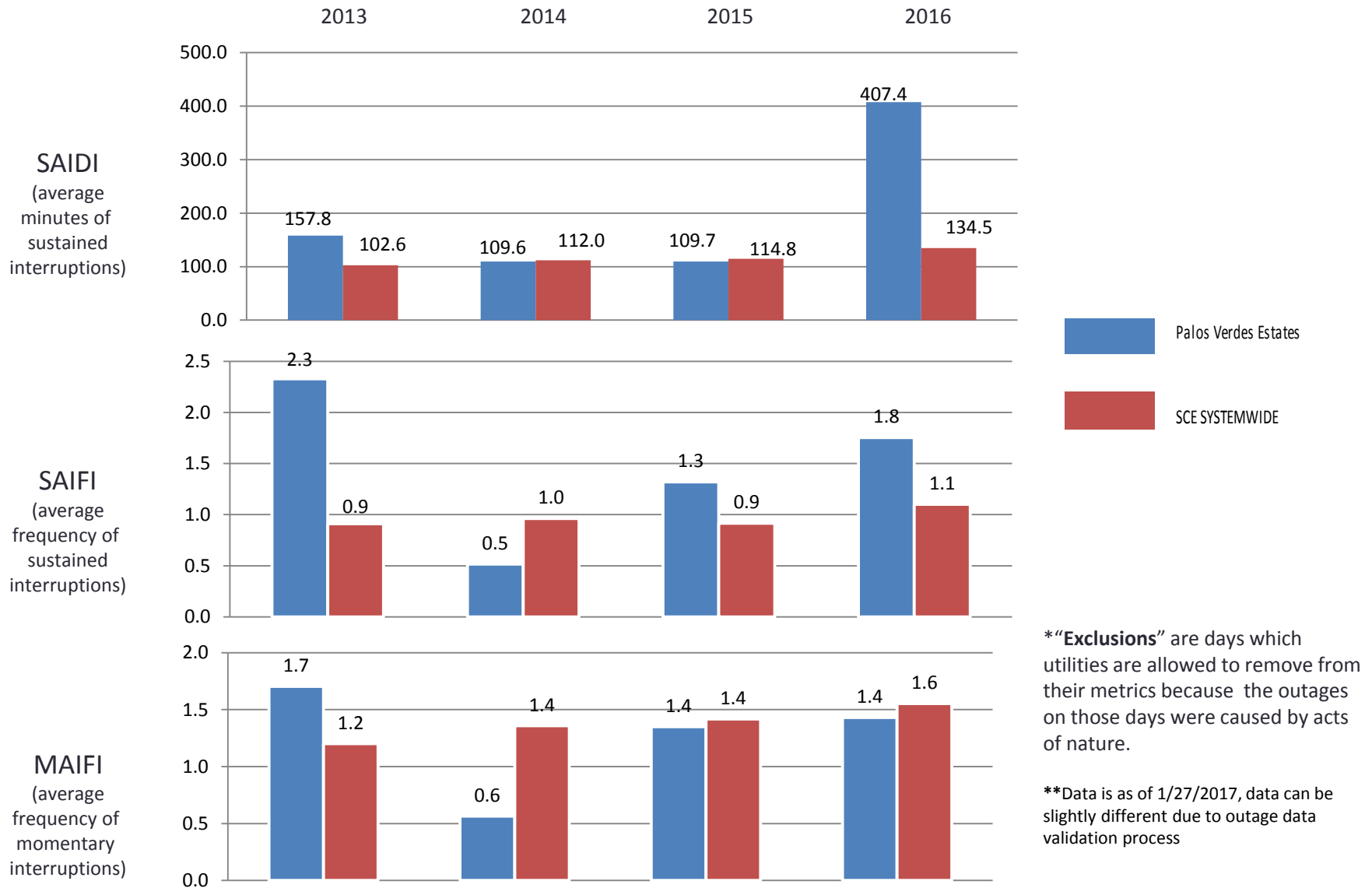
# Overview of Palos Verdes Estates

## There are 17 circuits that serve Palos Verdes Estates

Circuit Type	Sum of Customers	Circuit Type	Sum of Customers	Circuit Type	Sum of Customers	Circuit Type	Sum of Customers
ARCTURUS(4.16KV)	603						
BAUXITE(16KV)	2,339						
CHICO(16KV)	2,996						
COVEVIEW(16KV)	1,858						
CRESTWIND(4.16KV)	317						
JUPITER(4.16KV)	726						
LILAC(4.16KV)	501						
MAJOR(4.16KV)	839						
MALAGA COVE(4.16KV)	452						
PEACOCK(4.16KV)	136						
PIMA(4.16KV)	365						
PINZON(16KV)	1,151						
QUICKSILVER(16KV)	1,759						
TERRAZZO(4.16KV)	855						
TYBURN(4.16KV)	181						
VALMONTE(4.16KV)	527						
VIOLET(4.16KV)	457						

**Grand Total** 16,062

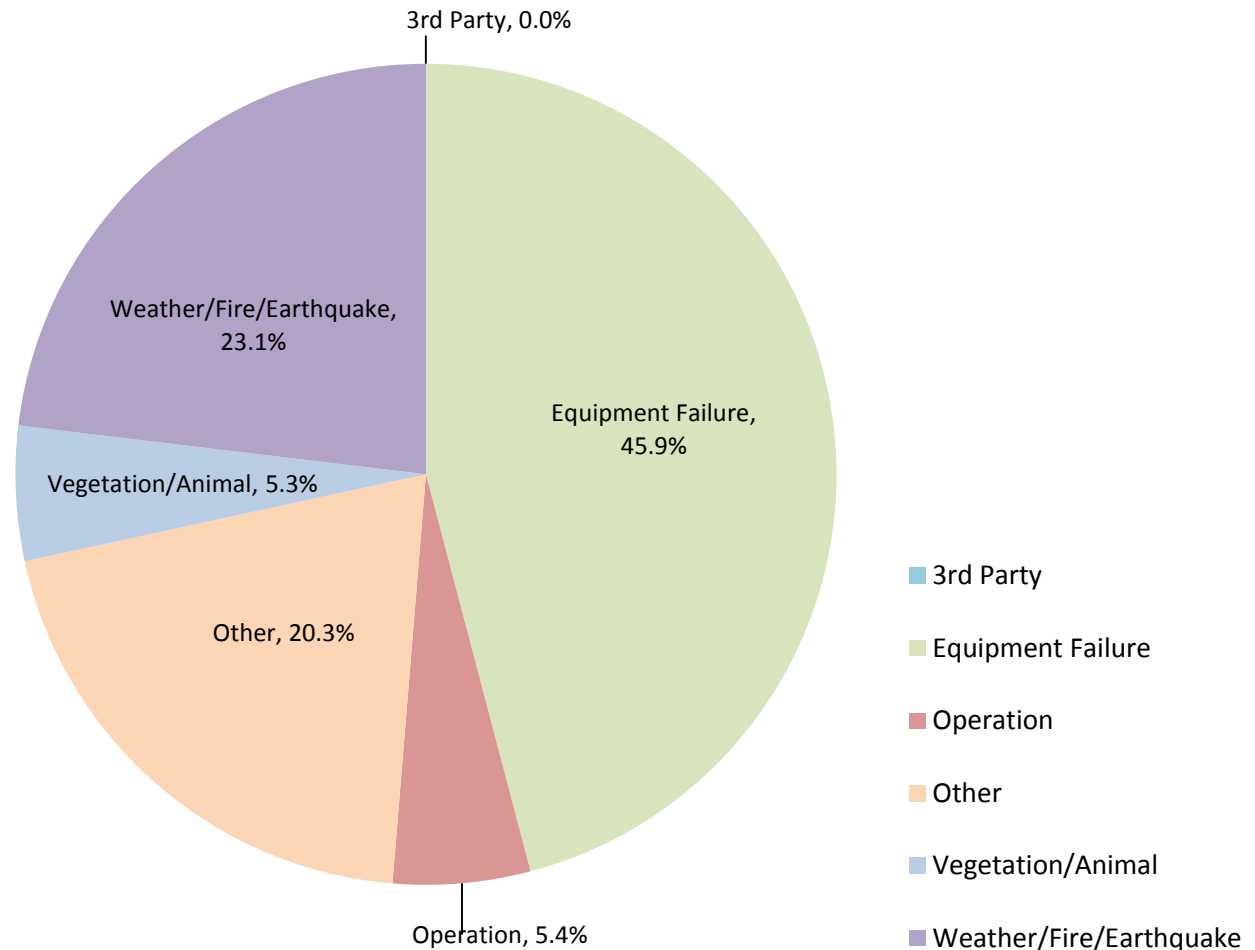
# Reliability History of Circuits Serving Palos Verdes Estates (No Exclusions)





# Causes of Repair Outages in Palos Verdes Estates Circuits 2016 YTD

## Contributions to SAIDI by Outage Cause

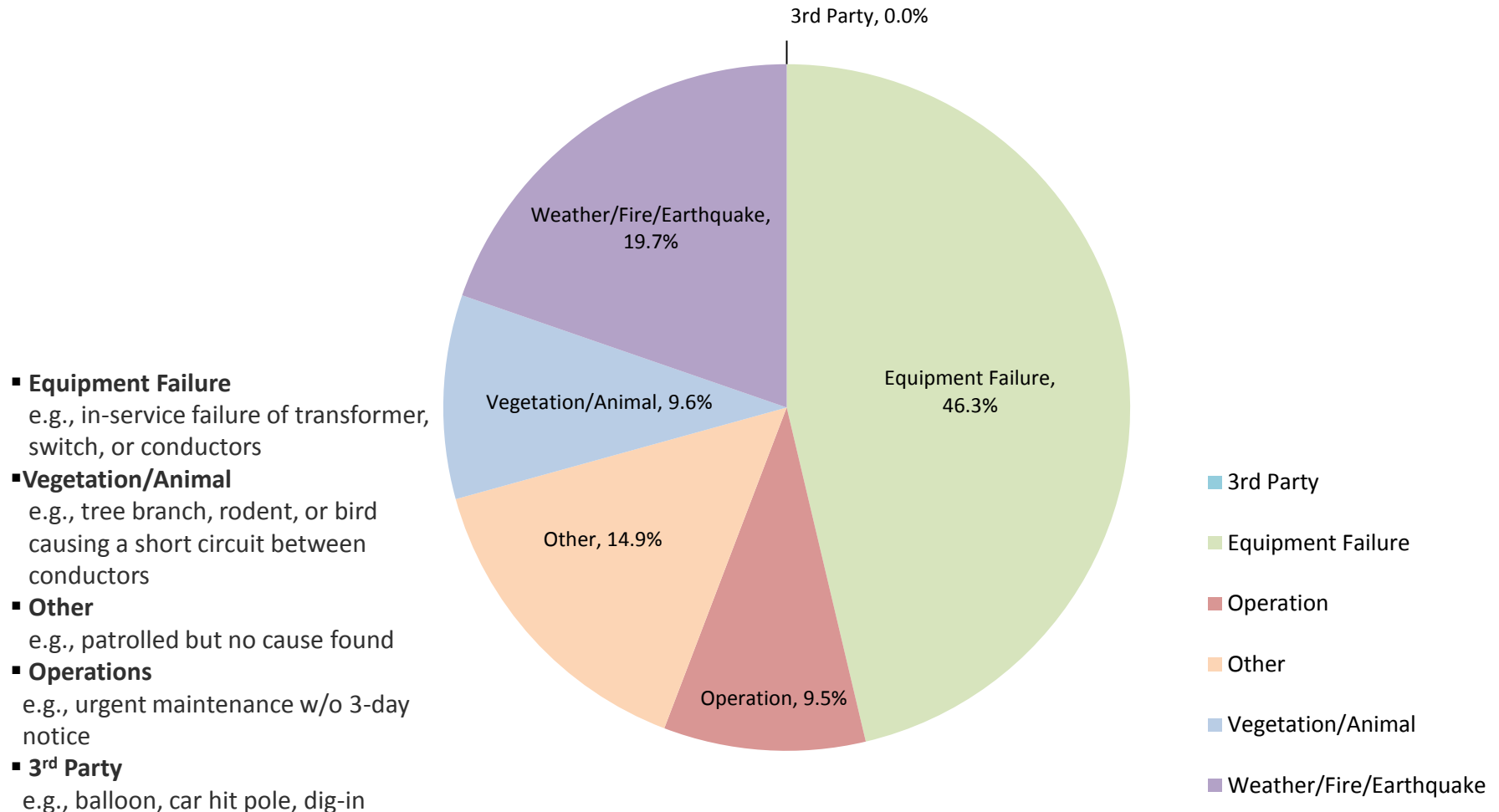


- **Equipment Failure**  
e.g., in-service failure of transformer, switch, or conductors
- **Vegetation/Animal**  
e.g., tree branch, rodent, or bird causing a short circuit between conductors
- **Other**  
e.g., patrolled but no cause found
- **Operations**  
e.g., urgent maintenance w/o 3-day notice
- **3rd Party**  
e.g., balloon, car hit pole, dig-in

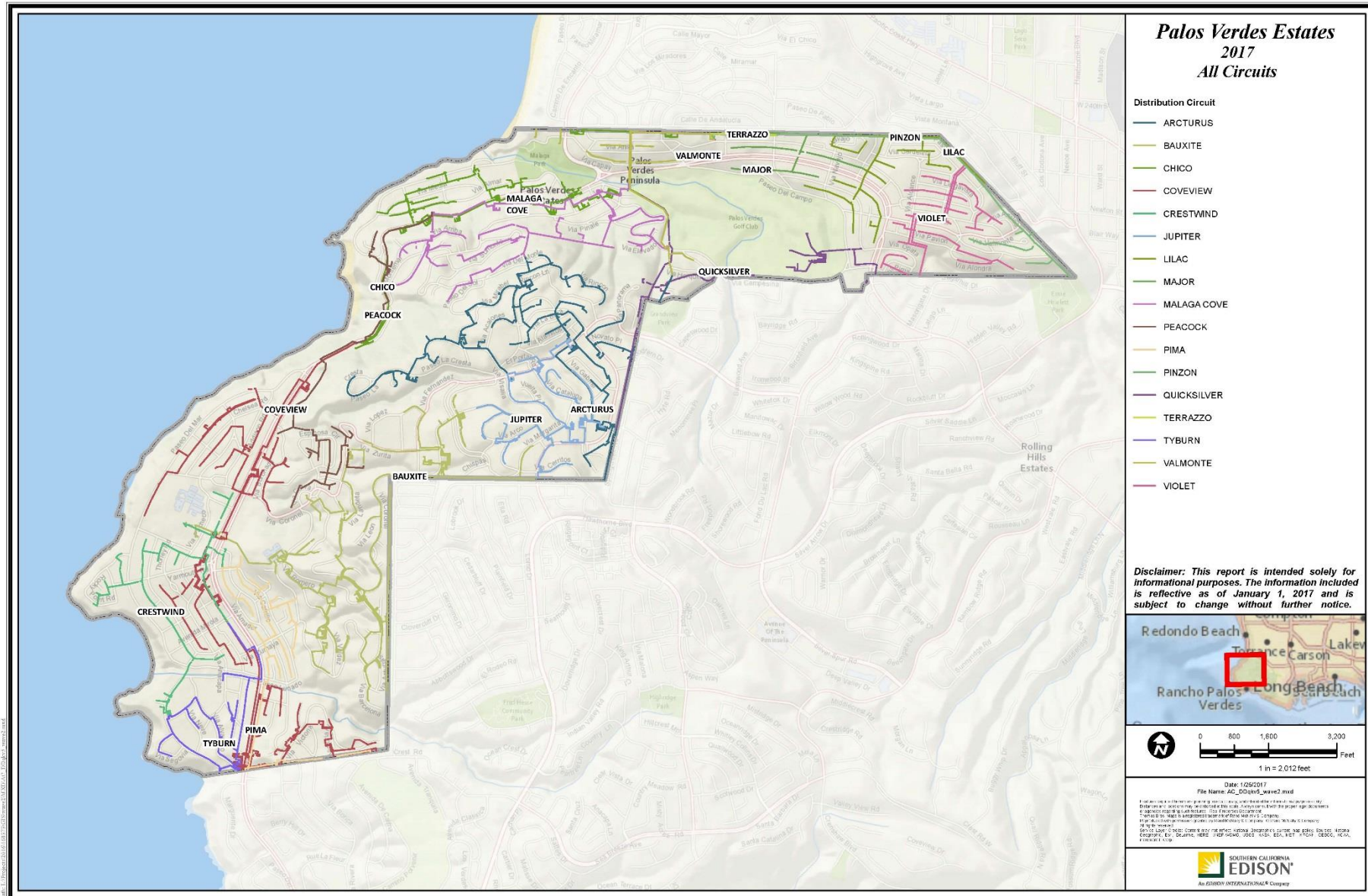
**SAIDI** = the cumulative amount of time the average customer is interrupted by “sustained” outages each year.

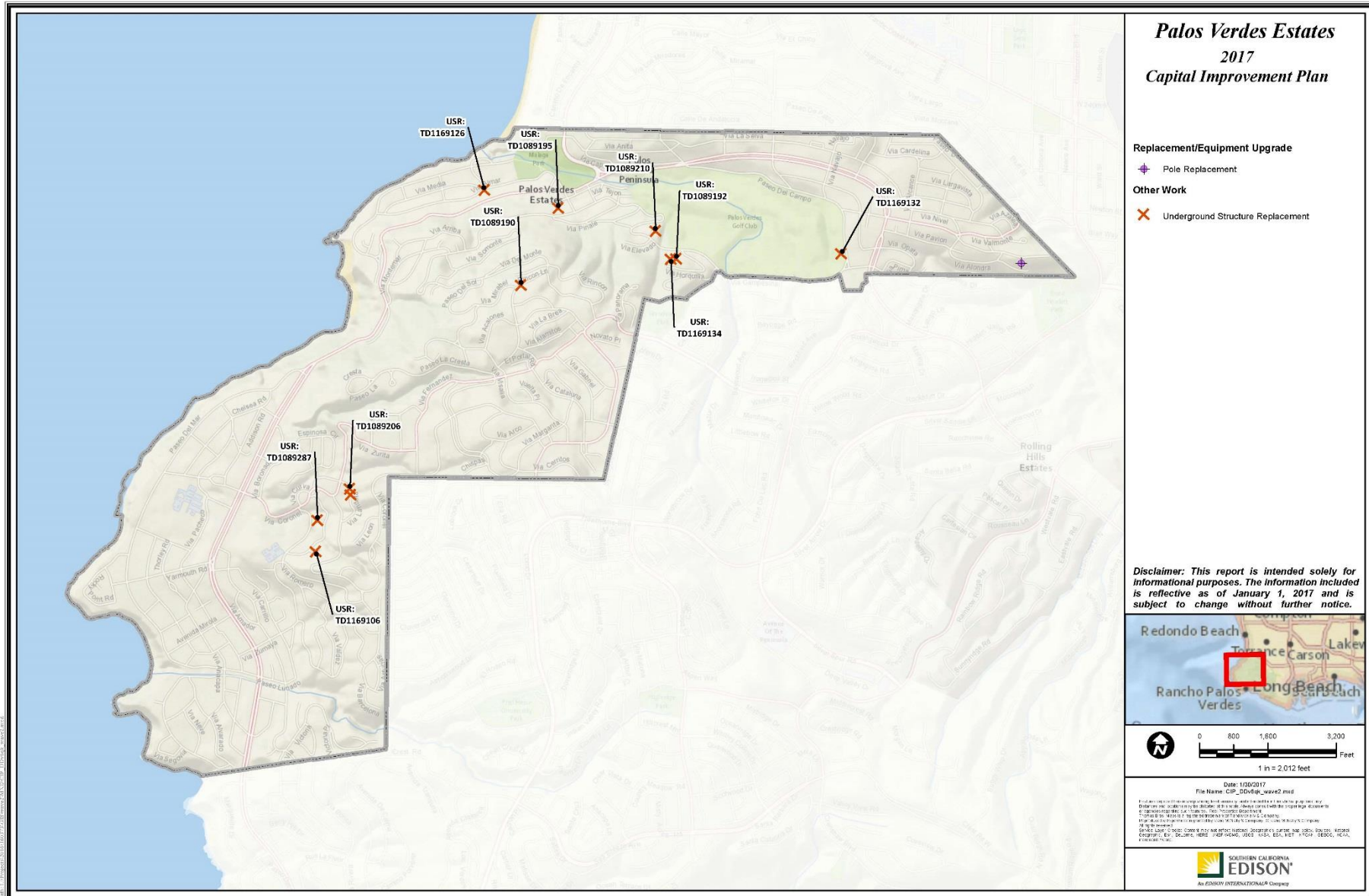
# Causes of Repair Outages in Palos Verdes Estates Circuits 2016 YTD

## Contributions to SAIFI by Outage Cause



**SAIFI** = the number of times the average customer is interrupted by “sustained” outages each year.





# Back-up Slides

**Reliability Histories of Circuits Serving Palos Verdes Estates**

**Updated through Year-End 2016**



# Average Reliability of 17 Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>Palos Verdes Estates</b>	<b>157.8</b>	<b>2.3</b>	<b>1.7</b>	<b>109.6</b>	<b>0.5</b>	<b>0.6</b>	<b>109.7</b>	<b>1.3</b>	<b>1.4</b>	<b>265.2</b>	<b>0.9</b>	<b>0.3</b>	<b>37.6</b>	<b>0.3</b>	<b>0.1</b>	<b>47.1</b>	<b>0.2</b>	<b>0.0</b>	<b>57.5</b>	<b>0.3</b>	<b>1.0</b>	<b>407.4</b>	<b>1.8</b>	<b>1.4</b>
3rd Party	6%	10%	9%	3%	22%	6%	9%	18%	6%	0%	0%	55%	0%	0%	0%	0%	0%	0%	0%	0%	19%	0%	0%	25%
Equipment Failure	85%	83%	44%	19%	23%	25%	38%	45%	60%	34%	31%	19%	33%	40%	0%	99%	98%	0%	67%	59%	16%	46%	46%	15%
Operation	4%	2%	0%	27%	18%	0%	20%	8%	13%	0%	3%	0%	16%	25%	33%	1%	2%	0%	25%	16%	30%	5%	10%	22%
Other	3%	3%	35%	46%	30%	34%	4%	2%	9%	30%	26%	26%	0%	0%	0%	0%	0%	100%	3%	8%	11%	20%	15%	17%
Vegetation/Animal	0%	0%	12%	5%	7%	23%	11%	16%	0%	0%	0%	0%	50%	35%	67%	0%	0%	0%	4%	17%	18%	5%	10%	16%
Weather/Fire/Earthquake	2%	2%	0%	0%	0%	13%	18%	11%	12%	35%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	23%	20%	5%
<b>SCE Systemwide</b>	<b>102.6</b>	<b>0.9</b>	<b>1.2</b>	<b>112.0</b>	<b>1.0</b>	<b>1.4</b>	<b>114.8</b>	<b>0.9</b>	<b>1.4</b>	<b>40.5</b>	<b>0.3</b>	<b>0.4</b>	<b>34.8</b>	<b>0.3</b>	<b>0.4</b>	<b>29.4</b>	<b>0.2</b>	<b>0.3</b>	<b>29.8</b>	<b>0.3</b>	<b>0.4</b>	<b>134.5</b>	<b>1.1</b>	<b>1.6</b>

## Notes:

No outages are excluded from the metrics.

## Outage Causes:

Other: e.g., patrolled but no cause could be found

Operations: e.g., urgent maintenance w/o 3-day notice to customers

3<sup>rd</sup> Party: e.g., balloons, car hit pole, dig-in

Vegetation/Animal: e.g., tree branch, rodent, or bird causing short circuit across conductors

SAIDI (minutes) = the cumulative amount of time the average customer is interrupted by "sustained" (longer than 5 minutes) outages.

SAIFI (interruptions) = the number of times the average customer is interrupted by "sustained" outages.

MAIFI (interruptions) = the number of times the average customer is interrupted by "momentary" (lasting 5 minutes or less) outages.

# Reliability Histories for Individual Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>ARCTURUS(4.16KV) - Customers: 603</b>	<b>155.1</b>	<b>1.2</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>109.3</b>	<b>1.0</b>	<b>0.0</b>	<b>361.6</b>	<b>1.0</b>	<b>0.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.7</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.0</b>	<b>361.6</b>	<b>1.0</b>	<b>2.5</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	91%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operation	1%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	27%
Other	9%	6%	100%	0%	0%	0%	0%	0%	0%	81%	18%	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%	81%	18%	73%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%	82%	0%
<b>BAUXITE(16KV) - Customers: 2,339</b>	<b>104.2</b>	<b>1.4</b>	<b>1.6</b>	<b>10.6</b>	<b>0.2</b>	<b>0.0</b>	<b>158.9</b>	<b>2.7</b>	<b>4.5</b>	<b>419.0</b>	<b>2.1</b>	<b>1.4</b>	<b>42.7</b>	<b>0.6</b>	<b>0.0</b>	<b>156.5</b>	<b>1.0</b>	<b>0.0</b>	<b>273.2</b>	<b>1.3</b>	<b>1.9</b>	<b>891.4</b>	<b>5.0</b>	<b>3.3</b>
3rd Party	0%	0%	0%	58%	25%	0%	0%	0%	0%	0%	0%	70%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%
Equipment Failure	100%	100%	39%	0%	0%	0%	28%	53%	78%	72%	51%	30%	100%	100%	0%	100%	100%	0%	68%	78%	46%	77%	74%	39%
Operation	0%	0%	0%	42%	75%	0%	40%	9%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	32%	22%	0%	10%	6%	0%
Other	0%	0%	61%	0%	0%	0%	0%	0%	0%	28%	49%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	20%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	24%	37%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	0%	0%	30%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>CHICO(16KV) - Customers: 2,996</b>	<b>181.0</b>	<b>4.2</b>	<b>2.4</b>	<b>334.3</b>	<b>0.9</b>	<b>0.9</b>	<b>158.0</b>	<b>0.9</b>	<b>1.6</b>	<b>5.2</b>	<b>0.0</b>	<b>0.0</b>	<b>18.7</b>	<b>0.1</b>	<b>0.0</b>	<b>22.4</b>	<b>0.1</b>	<b>0.0</b>	<b>1.0</b>	<b>0.0</b>	<b>2.0</b>	<b>47.2</b>	<b>0.2</b>	<b>2.0</b>
3rd Party	4%	15%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	44%	83%	50%	1%	1%	50%
Equipment Failure	76%	73%	41%	8%	16%	0%	34%	12%	59%	39%	39%	0%	0%	0%	0%	94%	78%	0%	0%	0%	0%	49%	26%	0%
Operation	1%	1%	0%	24%	12%	0%	22%	21%	0%	1%	1%	0%	100%	100%	0%	6%	22%	0%	56%	17%	50%	44%	66%	50%
Other	14%	8%	33%	68%	72%	100%	0%	0%	41%	60%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	6%	3%	0%	0%	0%	0%	44%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>COVEVIEW(16KV) - Customers: 1,858</b>	<b>152.7</b>	<b>2.1</b>	<b>0.8</b>	<b>88.6</b>	<b>0.2</b>	<b>0.0</b>	<b>7.3</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>31.0</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>95.1</b>	<b>0.1</b>	<b>0.0</b>	<b>126.1</b>	<b>0.2</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	96%	95%	100%	100%	98%	0%	0%	0%	0%	0%	0%	0%	93%	83%	0%	0%	0%	0%	100%	100%	0%	98%	90%	0%
Operation	4%	5%	0%	0%	2%	0%	100%	100%	0%	0%	0%	0%	7%	17%	0%	0%	0%	0%	0%	0%	0%	2%	10%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

# Reliability Histories for Individual Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>CRESTWIND(4.16KV) - Customers: 317</b>	<b>389.5</b>	<b>2.3</b>	<b>2.0</b>	<b>5.7</b>	<b>0.0</b>	<b>0.0</b>	<b>439.3</b>	<b>3.8</b>	<b>3.0</b>	<b>2019.4</b>	<b>2.5</b>	<b>1.0</b>	<b>69.3</b>	<b>1.0</b>	<b>0.0</b>	<b>85.5</b>	<b>1.0</b>	<b>0.0</b>	<b>77.4</b>	<b>1.2</b>	<b>2.0</b>	<b>2251.7</b>	<b>5.7</b>	<b>3.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%
Equipment Failure	100%	100%	49%	100%	100%	0%	30%	54%	67%	16%	60%	0%	100%	100%	0%	100%	100%	0%	19%	81%	50%	22%	79%	34%
Operation	0%	0%	0%	0%	0%	0%	55%	20%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	81%	19%	0%	3%	4%	0%
Other	0%	0%	51%	0%	0%	0%	0%	0%	0%	84%	40%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	76%	17%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	15%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	33%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>JUPITER(4.16KV) - Customers: 726</b>	<b>322.8</b>	<b>2.9</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>87.3</b>	<b>1.0</b>	<b>0.0</b>	<b>22.2</b>	<b>0.1</b>	<b>0.0</b>	<b>1.5</b>	<b>0.0</b>	<b>1.0</b>	<b>0.7</b>	<b>0.0</b>	<b>0.0</b>	<b>111.7</b>	<b>1.2</b>	<b>1.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	97%	96%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	20%	12%	0%
Operation	3%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	100%	100%	0%	2%	3%	0%
Other	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%	85%	0%
<b>LILAC(4.16KV) - Customers: 501</b>	<b>50.9</b>	<b>1.0</b>	<b>3.0</b>	<b>224.4</b>	<b>1.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>756.6</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>756.6</b>	<b>1.0</b>	<b>0.0</b>
3rd Party	16%	2%	33%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	84%	98%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	67%	99%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%
<b>MAJOR(4.16KV) - Customers: 839</b>	<b>61.0</b>	<b>2.1</b>	<b>1.0</b>	<b>31.2</b>	<b>0.2</b>	<b>0.8</b>	<b>3.5</b>	<b>0.1</b>	<b>1.0</b>	<b>564.8</b>	<b>2.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>49.7</b>	<b>1.0</b>	<b>0.0</b>	<b>614.5</b>	<b>3.0</b>	<b>2.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	95%	98%	100%	0%	0%	0%	94%	85%	0%	41%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	32%	0%
Operation	5%	2%	0%	0%	0%	0%	6%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	57%	50%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	53%	33%	50%
Vegetation/Animal	0%	0%	0%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	98%	99%	0%	8%	33%	50%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%



# Reliability Histories for Individual Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>MALAGA COVE(4.16KV) - Customers: 452</b>	<b>190.0</b>	<b>2.5</b>	<b>0.0</b>	<b>299.2</b>	<b>0.3</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>742.5</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>742.5</b>	<b>1.0</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	96%	80%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operation	4%	20%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%
<b>PEACOCK(4.16KV) - Customers: 136</b>	<b>172.8</b>	<b>2.0</b>	<b>1.0</b>	<b>32.4</b>	<b>0.1</b>	<b>0.0</b>	<b>146.6</b>	<b>2.8</b>	<b>3.7</b>	<b>174.1</b>	<b>2.1</b>	<b>1.0</b>	<b>65.9</b>	<b>1.0</b>	<b>0.0</b>	<b>83.7</b>	<b>1.0</b>	<b>0.0</b>	<b>15.0</b>	<b>1.0</b>	<b>2.0</b>	<b>338.7</b>	<b>5.1</b>	<b>3.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	34%
Equipment Failure	100%	100%	0%	91%	55%	0%	58%	67%	74%	25%	52%	0%	100%	100%	0%	100%	100%	0%	100%	100%	50%	62%	80%	33%
Operation	0%	0%	0%	9%	45%	0%	0%	0%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	100%	0%	0%	0%	0%	0%	0%	75%	48%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	38%	20%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	42%	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	33%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>PIMA(4.16KV) - Customers: 365</b>	<b>67.1</b>	<b>1.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>86.0</b>	<b>1.1</b>	<b>0.0</b>	<b>86.0</b>	<b>1.1</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operation	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	100%	100%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>PINZON(16KV) - Customers: 1,151</b>	<b>170.2</b>	<b>2.2</b>	<b>2.0</b>	<b>36.3</b>	<b>0.1</b>	<b>1.0</b>	<b>129.9</b>	<b>0.2</b>	<b>0.2</b>	<b>11.3</b>	<b>0.0</b>	<b>0.0</b>	<b>41.1</b>	<b>0.1</b>	<b>0.0</b>	<b>245.6</b>	<b>0.5</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>2.0</b>	<b>298.0</b>	<b>0.6</b>	<b>2.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	94%	95%	50%	0%	0%	0%	100%	100%	100%	60%	18%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	85%	81%	0%
Operation	6%	5%	0%	100%	100%	0%	0%	0%	0%	40%	82%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	50%
Vegetation/Animal	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	14%	15%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	50%

# Reliability Histories for Individual Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>QUICKSILVER(16KV) - Customers: 1,759</b>	<b>192.7</b>	<b>2.3</b>	<b>4.2</b>	<b>85.6</b>	<b>1.5</b>	<b>0.8</b>	<b>225.7</b>	<b>4.8</b>	<b>1.4</b>	<b>387.1</b>	<b>1.9</b>	<b>0.0</b>	<b>145.4</b>	<b>1.0</b>	<b>0.0</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.9</b>	<b>0.0</b>	<b>1.0</b>	<b>533.6</b>	<b>2.9</b>	<b>1.0</b>
3rd Party	36%	44%	0%	30%	65%	0%	40%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	56%	52%	47%	8%	3%	0%	45%	53%	31%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operation	0%	0%	0%	24%	19%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	100%	100%	100%	0%	0%	99%
Other	0%	0%	24%	0%	0%	0%	10%	2%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Vegetation/Animal	1%	0%	29%	38%	12%	100%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	27%	34%	0%
Weather/Fire/Earthquake	7%	4%	0%	0%	0%	0%	5%	1%	69%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	65%	0%
<b>TERRAZZO(4.16KV) - Customers: 855</b>	<b>72.0</b>	<b>1.0</b>	<b>0.0</b>	<b>84.2</b>	<b>1.1</b>	<b>1.2</b>	<b>12.1</b>	<b>0.1</b>	<b>0.0</b>	<b>3.8</b>	<b>0.0</b>	<b>0.0</b>	<b>34.0</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>37.8</b>	<b>1.0</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	94%	94%	0%	100%	100%	100%	33%	21%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	1%	0%
Operation	6%	6%	0%	0%	0%	0%	67%	79%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	90%	99%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>TYBURN(4.16KV) - Customers: 181</b>	<b>540.2</b>	<b>5.0</b>	<b>1.0</b>	<b>124.6</b>	<b>0.5</b>	<b>0.0</b>	<b>271.6</b>	<b>2.2</b>	<b>0.0</b>	<b>89.6</b>	<b>0.1</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>89.6</b>	<b>0.1</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	100%	100%	100%	0%	0%	0%	44%	46%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%
Operation	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	56%	54%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>VALMONTE(4.16KV) - Customers: 527</b>	<b>42.1</b>	<b>1.0</b>	<b>0.0</b>	<b>0.7</b>	<b>0.0</b>	<b>1.0</b>	<b>100.5</b>	<b>0.1</b>	<b>1.9</b>	<b>755.6</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>755.6</b>	<b>1.0</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	7%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	100%	100%	0%	0%	0%	100%	0%	0%	0%	100%	98%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	98%	0%
Operation	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	93%	50%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

# Reliability Histories for Individual Circuits Serving Palos Verdes Estates

	2013			2014			2015			1st Qtr 2016			2nd Qtr 2016			3rd Qtr 2016			4th Qtr 2016			2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
<b>VIOLET(4.16KV) - Customers: 457</b>	<b>186.4</b>	<b>2.0</b>	<b>0.0</b>	<b>2.0</b>	<b>0.0</b>	<b>0.0</b>	<b>31.7</b>	<b>1.1</b>	<b>1.0</b>	<b>28.0</b>	<b>1.0</b>	<b>0.0</b>	<b>22.3</b>	<b>0.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>6.4</b>	<b>0.0</b>	<b>0.0</b>	<b>56.7</b>	<b>1.3</b>	<b>0.0</b>
3rd Party	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	30%	89%	0%	63%	46%	0%	14%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	14%	0%	5%	0%	0%
Operation	70%	11%	0%	37%	54%	0%	2%	3%	0%	100%	100%	0%	100%	100%	0%	0%	0%	0%	57%	86%	0%	95%	100%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	0%	0%	0%	84%	94%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%