

Circuit Reliability Review Canyon Lake

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

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 Wildomar District

Aguanga

Canyon Lake

El Cerrito

Lake Elsinore

Lakeland Village

Meadowbrook

Murrieta

Temecula

Wildomar

Reliability by SCE District (No Exclusions)

		20	12			20:	13			20	14			20	15		2016				
	District	SAIDI	District	SAIFI																	
District Name	SAIDI	RANKING	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	
SCE SystemWide	108.13		0.89		102.61		0.91		112.00		0.96	_	114.83		0.92		134.48		1.10		

^{*&}quot;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.

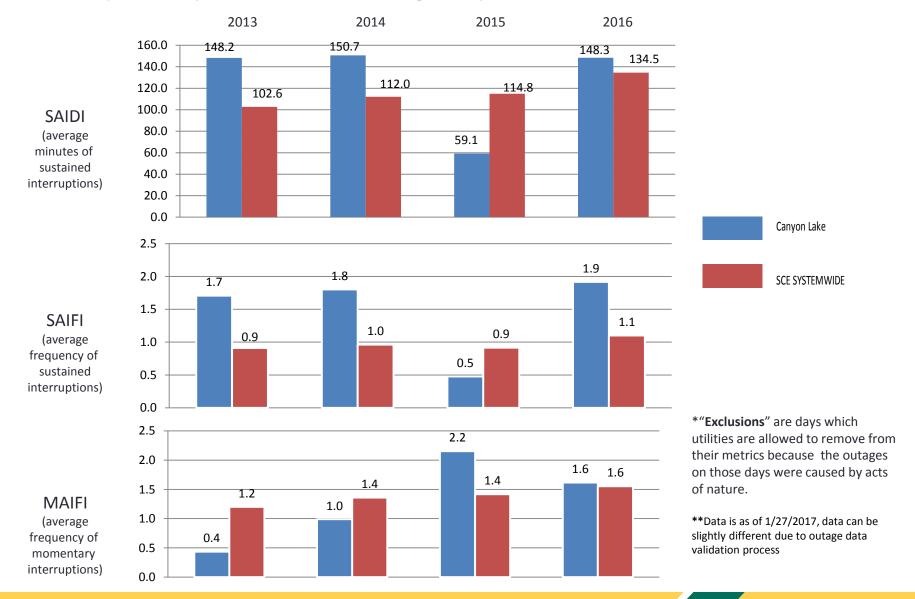
^{**}In the columns showing "Rank," lower numbers indicate poorer performance.

Overview of Canyon Lake There are 7 circuits that serve Canyon Lake

Circuit Type	Sum of Customers	Circuit Type	Sum of Customers	Circuit Type	Sum of Customers	Circuit Type	Sum of Customers
BAYLINER(12KV)	777						
BECKER(12KV)	2,296						
CASE(33KV)	2						
GOETZ(12KV)	1,551						
HARNAGE(12KV)	1,926						
NEAPOLITAN(12KV)	1,331						
SEARAY(12KV)	2,169						

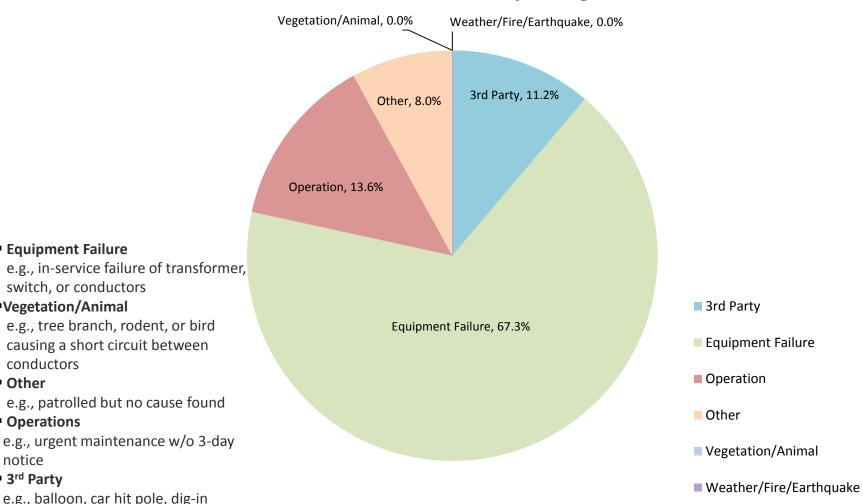
Grand Total 10,052

Reliability History of Circuits Serving Canyon Lake (No Exclusions)



Causes of Repair Outages in Canyon Lake Circuits 2016

Contributions to SAIDI by Outage Cause



notice ■ 3rd Party

Equipment Failure

conductors

Operations

Other

switch, or conductors ■Vegetation/Animal

e.g., balloon, car hit pole, dig-in

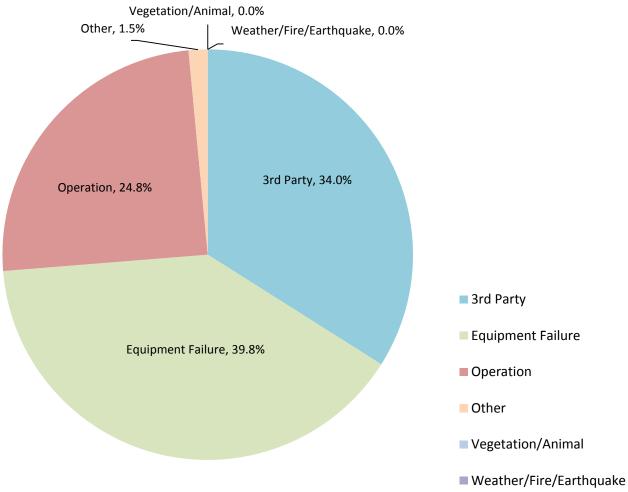
e.g., tree branch, rodent, or bird

causing a short circuit between

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

Causes of Repair Outages in Canyon Lake Circuits 2016 YTD

Contributions to SAIFI 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

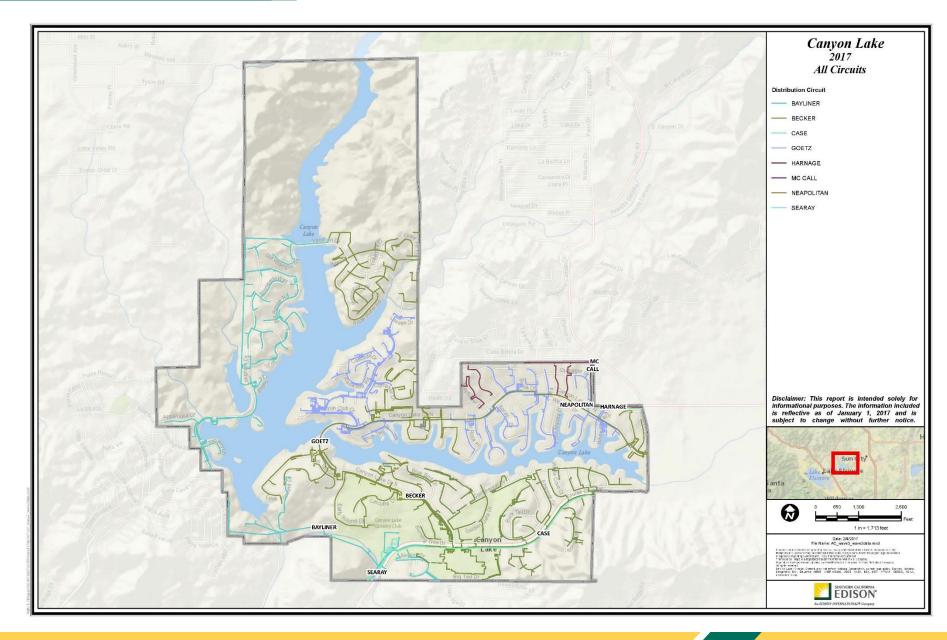
Operations

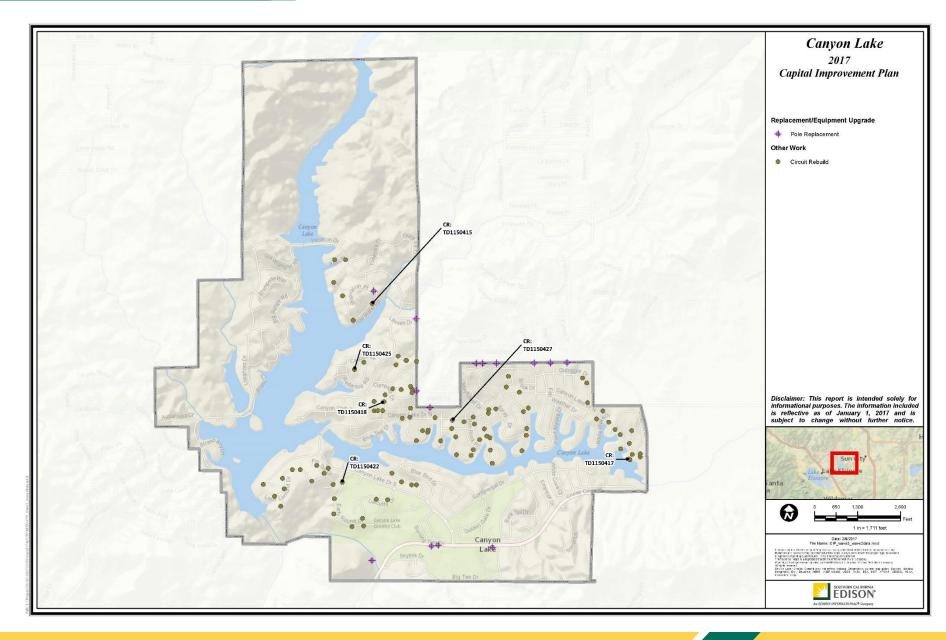
e.g., urgent maintenance w/o 3-day notice

■ 3rd Party

e.g., balloon, car hit pole, dig-in

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





Back-up Slides

Reliability Histories of Circuits Serving Canyon Lake

Updated through Year-End 2016

Average Reliability of 7 Circuits Serving Canyon Lake

		2013			2014			2015	•	1st	Qtr 20	16	2nd Qtr 2016			3rd	d Qtr 2	016	4th	Qtr 20	016			
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIF
Canyon Lake	148.2	1.7	0.4	150.7	1.8	1.0	59.1	0.5	2.2	13.8	0.1	0.1	55.3	0.8	0.6	13.6	0.1	0.0	65.7	1.0	1.0	148.3	1.9	1.6
3rd Party	55%	55%	0%	45%	69%	57%	17%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	68%	47%	11%	34%	28%
Equipment Failure	33%	17%	30%	37%	21%	31%	57%	43%	13%	55%	87%	0%	76%	50%	0%	69%	38%	0%	62%	26%	0%	67%	40%	0%
Operation	11%	22%	2%	4%	3%	12%	19%	18%	48%	1%	1%	0%	14%	48%	1%	31%	62%	0%	12%	6%	22%	14%	25%	13%
Other	0%	6%	68%	6%	2%	0%	1%	11%	39%	44%	12%	100%	10%	2%	99%	0%	0%	0%	0%	0%	11%	8%	1%	47%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	5%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	12%
Weather/Fire/Earthquake	0%	0%	0%	7%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SCE Systemwide	102.6	0.9	1.2	112.0	1.0	1.4	114.8	0.9	1.4	40.5	0.3	0.4	34.8	0.3	0.4	29.4	0.2	0.3	29.8	0.3	0.4	134.5	1.1	1.6

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

3rd 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 Canyon Lake

		2013			2014			2015		1st	Qtr 20 1	16	2nc	l Qtr 20	016	3rd	Qtr 20	16	4th Qtr 2016				2016	
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI I	VIAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
BAYLINER(12KV) - Customers: 777	108.7	2.0	1.0	374.5	4.2	1.1	254.5	1.0	4.0	0.0	0.0	0.0	151.6	4.0	2.0	87.5	0.1	0.0	122.3	3.1	0.3	361.4	7.2	2.3
3rd Party	36%	50%	0%	50%	71%	89%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	54%	93%	100%	18%	40%	12%
Equipment Failure	0%	0%	0%	7%	3%	11%	37%	13%	25%	0%	0%	0%	77%	50%	0%	93%	69%	0%	40%	6%	0%	68%	32%	0%
Operation	64%	50%	0%	8%	2%	0%	48%	78%	0%	0%	0%	0%	23%	50%	0%	7%	31%	0%	6%	1%	0%	13%	29%	0%
Other	0%	0%	100%	0%	0%	0%	0%	0%	75%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	88%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	16%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Weather/Fire/Earthquake	0%	0%	0%	36%	24%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BECKER(12KV) - Customers: 2,296	166.4	1.2	0.0	101.7	1.8	1.9	26.3	0.1	2.2	0.0	0.0	0.0	4.2	0.0	0.0	10.0	0.1	0.0	62.6	0.3	0.0	76.7	0.4	0.0
3rd Party	58%	72%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	36%	12%	0%	100%	100%	100%	96%	84%	0%	0%	0%	0%	0%	0%	0%	44%	26%	0%	51%	22%	0%	48%	20%	0%
Operation	6%	15%	0%	0%	0%	0%	4%	16%	50%	0%	0%	0%	100%	100%	0%	56%	74%	0%	49%	78%	0%	52%	80%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	50%	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%
CASE(33KV) - Customers: 2	37.5	1.5	0.5	1337.0	2.0	1.0	0.0	0.0	3.0	0.0	0.0	0.0	103.0	2.0	2.0	609.0	1.0	0.0	2236.0	2.0	2.0	2948.0	5.0	4.0
3rd Party	44%	33%	0%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	76%	40%	50%
Equipment Failure	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	93%	50%	0%	0%	0%	0%	0%	0%	0%	3%	20%	0%
Operation	56%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	50%	0%	100%	100%	0%	0%	0%	0%	21%	40%	0%
Other	0%	0%	100%	0%	0%	0%	0%	0%	67%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	50%
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%
GOETZ(12KV) - Customers: 1,551	101.3	0.9	0.0	126.9	0.5	0.0	3.1	0.1	1.0	0.0	0.0	0.0	76.9	0.2	0.0	13.9	0.1	0.0	0.0	0.0	0.0	90.8	0.3	0.0
3rd Party	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	0%	0%	0%	93%	72%	0%	0%	0%	0%	0%	0%	0%	42%	42%	0%	90%	56%	0%	0%	0%	0%	49%	47%	0%
Operation	0%	0%	0%	7%	28%	0%	100%	100%	100%	0%	0%	0%	10%	15%	100%	10%	44%	0%	0%	0%	0%	10%	25%	100%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	42%	0%	0%	0%	0%	0%	0%	0%	41%	28%	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 Canyon Lake

		2013		2014				2015		1st	Qtr 20	16	2nd	l Qtr 2	016	3rd Qtr 2016			4th	Qtr 20 .	16	2016		
	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI MA	AIFI	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI
HARNAGE(12KV) - Customers: 1,926	130.1	1.6	0.0	52.5	1.1		117.5	0.7	2.1	70.7	0.6	0.4	8.0	0.0	0.0			0.0	0.0	0.0	1.0	78.7	0.6	
3rd Party	83%	62%	0%	83%	93%	66%	41%	85%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	14%	5%	0%	1%	0%	0%	59%	15%	0%	55%	87%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	60%	88%	0%
Operation	0%	1%	0%	16%	6%	34%	0%	0%	74%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Other	2%	32%	0%	0%	0%	0%	0%	0%	26%	44%	12%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	12%	30%
Vegetation/Animal	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	70%
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%
NEAPOLITAN(12KV) - Customers: 1,331	276.8	1.6	0.7	192.5	0.6	0.0	53.3	1.4	1.4	0.0	0.0	0.0	46.5	0.1	0.0	6.2	0.0	0.0	16.1	0.1	0.7	68.9	0.2	0.7
3rd Party	42%	62%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Equipment Failure	49%	30%	100%	68%	48%	0%	85%	72%	0%	0%	0%	0%	78%	50%	0%	0%	0%	0%	71%	34%	0%	69%	35%	0%
Operation	9%	8%	0%	2%	8%	0%	5%	3%	74%	0%	0%	0%	22%	50%	0%	100%	100%	0%	29%	66%	0%	31%	65%	0%
Other	0%	0%	0%	31%	44%	0%	11%	25%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	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%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SEARAY(12KV) - Customers: 2,169	97.8	2.5	0.9	176.8	3.2	1.1	1.8	0.0	2.8	0.0	0.0	0.0	108.4	2.0	2.0	6.3	0.0	0.0	187.4	3.1	3.0	302.1	5.1	5.0
3rd Party	30%	35%	0%	99%	99%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	66%	67%	17%	40%	41%
Equipment Failure	49%	27%	0%	0%	0%	0%	0%	0%	34%	0%	0%	0%	94%	51%	0%	0%	0%	0%	72%	34%	0%	78%	40%	0%
Operation	21%	38%	4%	1%	1%	0%	100%	100%	33%	0%	0%	0%	6%	49%	0%	100%	100%	0%	0%	0%	33%	4%	20%	20%
Other	0%	0%	96%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	39%
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%