

Megan Caulson SDG&E Regulatory Tariffs Manager

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February 27, 2015

Timothy Sullivan
Acting Executive Director
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Re: San Diego Gas & Electric Company (SDG&E) 2014 Electric System Reliability Annual

Report

Dear Mr. Sullivan,

Pursuant to Ordering Paragraph 1 of D.96-09-045, SDG&E hereby submits its Electric System Reliability Report for the calendar year ended December 31, 2014.

As detailed in SDG&E Advice Letter 2256-E (approved June 9, 2011), this report provides SDG&E's Historical System Reliability Data based on IEEE 1366 exclusion criteria, in addition to the Historical System Reliability Data based on D.96-09-045 exclusion criteria.

If there are any questions concerning the enclosed information, please contact Megan Caulson at (858) 654-1748.

Sincerely,

Megan Caulson Regulatory Tariff Manager

Encl.

cc: Edward Randolph, Energy Division

David Lee, Energy Division Mason Withers, SDG&E



# ELECTRIC SYSTEM RELIABILITY ANNUAL REPORT

2014



Prepared for California Public Utilities Commission

**February 25, 2015** 

#### **EXECUTIVE SUMMARY**

This Electric System Reliability Annual Report for 2014 has been prepared in response to CPUC Decision 96-09-045 and SDG&E Advice Letter 2256-E which was approved June 9, 2011. Decision 96-09-045 established reliability recording, calculation, and reporting requirements for SDG&E. Advice Letter 2256-E changed SDG&E's outage exclusion criteria from "CPUC Major Events" to "IEEE Major Event Days" effective January 1, 2013 as described below.

The data in this report is presented in tabular form. All statistics and calculations include forced transmission, substation, and distribution outages, and exclude planned outages. Forced outages are those that are not prearranged. For the purposes of this report, sustained outages are those outages that lasted more than 5 minutes in duration, while momentary outages are those outages that lasted 5 minutes or less in duration.

The reliability indicators that are tracked are as follows:

- 1. SAIDI (System Average Interruption Duration Index) minutes of sustained outages per customer per year.
- 2. SAIFI (System Average Interruption Frequency Index) number of sustained outages per customer per year.
- 3. MAIFI (Momentary Average Interruption Frequency Index) number of momentary outages per customer per year.
- 4. SAIDET\* (System Average Interruption Duration Index Exceeding Threshold) minutes of sustained outages per customer per year exceeding a defined annual threshold of 150 minutes.
- 5. ERT\* (Estimated Restoration Time) sum of the weighted accuracy of each outage divided by the number of customers who experienced an outage. Weighted accuracy is determined by using the time in play and number of customers who received accurate estimates.

<sup>\*</sup> Introduced as new reliability indices in 2008 as a result of SDGE's General Rate Case Application: (A) 06-12-009 and resulting decision (D) 08-07-046

Prior to 2013 the measurement of each reliability performance indicator excluded CPUC Major Events and events that are the direct result of failures in the ISO-

controlled bulk power market, or non-SDG&E owned transmission and distribution facilities. A CPUC Major Event is defined in CPUC Decision 96-09-045 as an event that meets at least one of the following criteria:

- (a) The event is caused by earthquake, fire, or storms of sufficient intensity to give rise to a state of emergency being declared by the government, or
- (b) Any other disaster not in (a) that affects more than 15% of the system facilities or 10% of the utility's customers, whichever is less for each event.

Restricted access by a governmental agency that precluded or otherwise delayed outage restoration times were considered CPUC Major Events and excluded from reliability results.

Beginning in 2013 the measurement of each reliability performance indicator excludes IEEE Major Event Days instead of CPUC Major Events. An IEEE Major Event Day is defined in IEEE-1366, Section 4.5 as a day in which the daily system SAIDI exceeds a threshold value, "Tmed". Thus, any day in which the total system SAIDI exceeds Tmed is excluded from SDG&E's reliability results. The applicable Tmed value is calculated at the end of each year using SDG&E's daily SAIDI values for the prior 5 years. SDG&E's Tmed value for 2014 was 3.84 minutes of daily system SAIDI.

A summary of 2014 performance is as follows:

CRITERIA	SAIDI	SAIFI	MAIFI	SAIDET	ERT
Including IEEE Major Event Days (2014)	75.81	0.632	0.262	ı	-
Excluding IEEE Major Event Days (2014)	64.60	0.603	0.244	30.36	13%
10-Year Average (2005-2014) Including CPUC Major Events or IEEE Major Event Days	129.58	0.689	0.395	_	-
10-Year Average (2005-2014) Excluding CPUC Major Events or IEEE Major Event Days	59.86	0.527	0.377	_	_

The IEEE Major Event Days that were declared in 2014 are shown in the following table.

Month/Day	SAIDI	SAIFI	Sustained Customer Impact	MAIFI	Momentary Customer Impact	Event Cause(s)
May 14	6.17	0.014	19,978	0.02	4,682	Wind and Fire Storm
September 16	5.04	0.015	21,823	0.02	24,736	Heat and Rain Storm

In 2014, approximately 503 customers within SDG&E's service territory experienced more than one 5 minute (or longer) outage per month on a rolling annual average basis, after exclusion of IEEE Major Event Days.

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## HISTORICAL SYSTEM RELIABILITY DATA (USING D.96-09-045 EXCLUSION CRITERIA)

	All Forced I	nterruption	s Included			СРІ	JC Major E	vents Excluded
Year	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	No. of Events	Event Cause(s)
2005	61.99	0.637	0.602	58.46	0.567	0.568	10	Fires (4), Interruptions Due to Non- SDG&E Facilities (4), Storms (2)
2006	52.83	0.545	0.494	52.65	0.541	0.494	9	Fires (6), Interruptions Due to Non- SDG&E Facilities (3)
2007	182.17	0.590	0.572	52.00	0.481	0.527	8	State of Emergency Declared (2), Interruptions Due to Non-SDG&E Facilities (2), Load Curtailment (1), Request to De-energize/ Restricted Access (3)
2008	59.17	0.517	0.380	58.92	0.515	0.378	9	Fires (2), Request to De-energize/ Restricted Access (7)
2009	67.06	0.542	0.380	66.01	0.538	0.380	4	Fires (1), Interruptions Due to Non- SDG&E Facilities (1), Request to De- energize/ Restricted Access (2)
2010	89.77	0.863	0.510	67.74	0.543	0.431	12	Storms (2), Interruptions Due to Non- SDG&E Facilities (6), Load Curtailment (1), Request to De- energize/ Restricted Access (3)
2011	567.59	1.472	0.239	54.14	0.473	0.239	5	Requests to De-energize (2), Restricted Access (1), Southwest Electrical Outage (1), Interruptions Due to Non-SDG&E Facilities (1)
2012**	64.36	0.533	0.301	64.11	0.532	0.301	4	Restricted Access (1), Requests to De-energize (3)

### HISTORICAL SYSTEM RELIABILITY DATA (USING IEEE 1366 EXCLUSION CRITERIA)

	All Forced	Interruptions	Included	Threshold Major Event Days Excluded *			
Year	SAIDI	SAIFI	MAIFI	SAIDI	SAIFI	MAIFI	
2005	61.99	0.637	0.602	61.99	0.637	0.602	
2006	52.83	0.545	0.494	52.83	0.545	0.494	
2007	182.17	0.590	0.572	54.89	0.477	0.530	
2008	59.17	0.517	0.380	59.17	0.517	0.380	
2009	67.06	0.542	0.380	49.71	0.466	0.362	
2010	89.77	0.863	0.510	63.36	0.520	0.444	
2011	567.59	1.472	0.239	53.43	0.471	0.239	
2012	64.36	0.533	0.301	64.36	0.533	0.301	
2013	75.03	0.561	0.211	59.96	0.472	0.211	
2014	75.81	0.632	0.262	64.60	0.603	0.244	

<sup>\*</sup> Per IEEE Standard 1366-2003 "2.5 beta method" for determining excludable days, days are excluded from a given year's metric if their SAIDI exceeds 2.5 times the standard deviation of daily SAIDI over the previous five year period.

#### **TEN LARGEST OUTAGE EVENTS IN 2014\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	IEEE Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	May 14	May Wind and Fire Storm	6.17	0.014	Yes	19,978	5,801	Not Available
2	September 16	September Heat and Rain Storm	5.04	0.015	Yes	21,743	3,183	Not Available
3	April 29	Wind Storm	3.58	0.014	No	19,570	4,395	Not Available
4	November 15	Animal Contact	2.16	0.033	No	46,867	523	Not Available
5	February 28	Rain Storm	1.23	0.008	No	11,157	3,647	Not Available
6	May 31	Vehicle Contact	0.95	0.004	No	6,119	2,081	Not Available
7	June 15	Faulted Tee	0.90	0.004	No	5,896	693	Not Available
8	March 9	Faulted Switch	0.80	0.004	No	6,169	825	Not Available
9	November 22	Cable Failure	0.68	0.003	No	4,638	629	Not Available
10	January 12	Vehicle Contact	0.66	0.003	No	3,956	659	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2013\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	IEEE Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	July 18 - 19	Orange County Transmission Outage	15.07	0.089	Yes	124,579	1,991	Not Available
2	September 3 - 8	Heat and Rain Storm	3.26	0.018	No	25,534	7,163	Not Available
3	April 8 - 9	De-energized for safety	1.76	0.002	No	2,914	1,396	Not Available
4	December 26	Company Contractor Dig-in	1.11	0.006	No	8,094	901	Not Available
5	June 4 - 5	Undetermined	0.78	0.002	No	2,766	399	Not Available
6	December 3	Faulted Tee	0.69	0.003	No	3,765	718	Not Available
7	November 7 - 8	Faulted Switch	0.60	0.005	No	7,594	788	Not Available
8	January 7 - 8	Contractor Dig-in	0.57	0.001	No	1,271	868	Not Available
9	January 10 - 11	Undetermined	0.56	0.003	No	4,095	705	Not Available
10	March 12 - 13	Faulted Tee and Low Gas	0.51	0.001	No	1,702	528	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2012\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	September 9 - 11	September 9th - Storm	1.64	0.019	No	26,024	1,126	Not Available
2	June 23 - 24	Faulted Underground Cable	1.48	0.003	No	4,430	680	Not Available
3	July 12 -13	Faulted Tee and Circuit Breaker	1.45	0.014	No	20,177	686	Not Available
4	May 28	Faulted Tee	1.27	0.002	No	3,174	626	Not Available
5	May 6 - 7	Faulted Connector	0.79	0.003	No	4,608	501	Not Available
6	February 27 - 28	February 27 - Storm	0.76	0.004	No	5,760	1,000	Not Available
7	April 28	Faulted Switch	0.67	0.002	No	2,643	467	Not Available
8	March 26	Faulted Glass Insulator	0.64	0.003	No	4,288	209	Not Available
9	August 12 - 13	Damaged Overhead Conductor and Underground Cable	0.63	0.003	No	4,535	1,024	Not Available
10	March 17 - 21	March 17 - Storm	0.62	0.004	No	6,006	3,000	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2011\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	September 8 - 9	Pacific Southwest Electrical Outage	513.40	0.999	Yes	1,387,249	981	Not Available
2	June 28 - 29	Faulted Circuit Breaker	1.52	0.004	No	5,147	539	Not Available
3	October 16 - 17	Faulted Underground Cable	0.68	0.002	No	2,422	1,054	Not Available
4	March 15 - 16	Faulted Tee	0.64	0.004	No	5,257	704	Not Available
5	August 4 - 5	Faulted Underground Cable	0.57	0.004	No	5,285	706	Not Available
6	August 28 - 29	Storm	0.51	0.003	No	4,314	1,170	Not Available
7	October 22	Faulted Tee	0.48	0.004	No	5,096	609	Not Available
8	December 23 - 24	Vehicle Contact	0.45	0.001	No	1,210	1,543	Not Available
9	June 29	Faulted Underground Cable	0.44	0.002	No	2,140	453	Not Available
10	November 4	Faulted Cutout	0.43	0.006	No	7,841	77	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2010\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	January 18 - 22	Heavy Rain Storm	12.61	0.085	Yes	117,558	1,752	Not Available
2	December 20 - 23	Heavy Rain Storm	4.93	0.023	Yes	31,376	1,758	Not Available
3	April 1	ISO Ordered Load Curtailment	4.40	0.211	Yes	290,945	43	Not Available
4	September 30 - October 5	Heavy Rain and Lightning Storm	2.88	0.036	No	50,155	1,343	Not Available
5	January 5 - 6	Faulted Tee	1.57	0.004	No	5,111	760	Not Available
6	September 26 - 28	Heat Storm	1.42	0.010	No	13,531	624	Not Available
7	September 30 - October 1	Vehicle Contact	1.34	0.004	No	5,503	1,074	Not Available
8	October 21	Vehicle Contact	1.33	0.002	No	2,753	1,341	Not Available
9	April 4 - 5	Earthquake	1.22	0.003	No	4,512	651	Not Available
10	October 19 - 20	Heavy Rain and Lightning Storm	1.12	0.014	No	18,873	718	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2009\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	December 7 - 10	December Storm**	11.68	0.045	No	61,783	3,624	Not Available
2	December 13 - 14	Overhead Equipment Failure	4.49	0.016	No	21,956	1,099	Not Available
3	August 20 - 21	Vehicle Contact	1.05	0.004	Yes	5,031	970	Not Available
4	June 3 - 4	Lightning Storm	0.97	0.006	No	7,909	1,204	Not Available
5	February 9 - 10	Heavy Rain and Snow Storm	0.86	0.009	No	12,304	1,686	Not Available
6	December 7 -8	Underground Equipment Failure**	0.60	0.003	No	3,889	1,082	Not Available
7	November 18 - 19	Faulted Cable	0.53	0.003	No	4,322	950	Not Available
8	November 28 - 29	Heavy Rain Storm	0.50	0.006	No	8,779	756	Not Available
9	November 23 - 24	Underground Equipment Failure	0.48		No	4,045	544	Not Available
10	November 9 -10	Heavy Equipment Dig-In	0.47	0.005		7,458	1,167	Not Available

<sup>\*</sup> Based on SAIDI impact.

<sup>\*\*</sup> The information for both the Dec. 7-10 and Dec. 7-8 events have been updated since the filing of the 2009 annual report. The above figures represent the corrected values. An underground equipment failure was inadvertently associated with the December storm event. This had no impact on the filed SAIDI, SAIFI, and MAIFI impacts when excluding CPUC events.

#### **TEN LARGEST OUTAGE EVENTS IN 2008\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	December 17 - 22	Heavy Rain and Snow Storm throughout Service Territory, Part II	3.51	0.010	No	13,113	6,783	Not Available
2	January 5 - 8	Rain & Lightning Storm throughout Service Territory	1.33	0.011	No	15,438	1,731	Not Available
3	December 15	Heavy Rain and Snow Storm throughout Service Territory, Part I	1.02	0.006	No	8,421	421	Not Available
4	May 31	C138 & HC3 Tree Contact (also affecting C139 & 4kVs)	0.92	0.003	No	3,735	746	Not Available
5	October 19	C213 - Damaged Underground Cable	0.91	0.001	No	2,035	942	Not Available
6	June 22 - 23	C990 - Faulted Terminator	0.67	0.002	No	2,198	870	Not Available
7	April 8 - 9	C486 - Motor Vehicle Contact, Terminator and Cable Replaced	0.61	0.003	No	4,708	910	Not Available
8	December 25 - 26	C286 & EN2 - Multiple Circuits affected during Restoration	0.58	0.004	No	5,364	601	Not Available
9	May 23	C159 - Pothead Failure	0.56	0.002	No	3,178	298	Not Available
10	September 24	Bank 20 Bad Relay affecting circuits WA3, WA4, WA5 and WA6	0.56	0.004	No	6,128	178	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2007\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	October 21 - November 24**	Firestorm 2007 - Declaration of State of Emergency	128.42	0.055	Yes	74,088	40,453	Not Available
2	September 1 - 4	HEATWAVE 2007 (Labor Day Weekend)	1.59	0.010	No	13,662	833	Not Available
3	October 22	ISO Request - Load Curtailment during Firestorm 2007	1.18	0.051	Yes	68,826	34	Not Available
4	June 4	Laguna Niguel Outages - Faulted CB impacted Bus	1.15	0.016	No	21,425	254	Not Available
5	August 30	TL 629 & TL 6946 Lightning Contact on Swi 629-8	1.09	0.003	No	4,117	359	Not Available
6	July 28	Circuit 582 Underground Cable Failure	1.01	0.002	No	2,761	606	Not Available
7	October 11	Paradise Substation Bank 42 Lightning Arrestor Failure	0.80	0.017	No	23,121	85	Not Available
8	September 15 - 17	Circuit 221 Pine Valley Fire	0.77	0.000	No	585	2,942	Not Available
9	January 12 - 13	Circuits WA3, WA4, and UP1 - Downed Overhead Conductor	0.66	0.003	No	4,052	347	Not Available
10	December 25 - 26	Circuit EOS2 - Connector Failure	0.57	0.001	No	1,349	614	Not Available

<sup>\*</sup>Based on SAIDI impact.

<sup>\*\*</sup>The information for the largest event was inadvertently under reported in the 2007 annual report and has since been corrected above. This had no impact on the filed SAIDI, SAIFI, and MAIFI impacts when excluding CPUC events.

#### **TEN LARGEST OUTAGE EVENTS IN 2006\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	July 22 - 23**	Heat Storm	2.89	0.020	No	26,477	1,280	Not Available
2	March 10 - 14	Storm / Winds	1.98	0.003	No	4,501	4,160	Not Available
3	July 21	TL 685 - Misoperation of a Relay (7 Substations)	1.84	0.033	No	45,007	55	Not Available
4	July 15 - 17	Lighting/ Heat Storm	1.03	0.009	No	12,048	869	Not Available
5	January 2 - 3	Storm / Winds	0.68	0.011	No	15,329	811	Not Available
6	June 15	Circuits 416 and 76 Private Motor Vehicle Contact	0.60	0.002	No	3,124	644	Not Available
7	September 6 - 7	Circuits 509 and 506 Private Motor Vehicle Contact	0.53	0.002	No	2,908	946	Not Available
8	May 23	Circuit 592 Damaged Connector Failure	0.49	0.002	No	3,246	397	Not Available
9	May 26	Circuit 1077 Private Motor Vehicle Contact	0.42	0.002	No	2,158	636	Not Available
10	July 31 - August 1	Circuit WY1 - Vegetation Contact	0.42	0.001	No	1,070	1,058	Not Available

<sup>\*</sup> Based on SAIDI impact.
\*\* Includes outages initiated on July 23<sup>rd</sup> and restored on July 24<sup>th</sup>.

#### **TEN LARGEST OUTAGE EVENTS IN 2005\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	September 19	September Storm	2.78	0.015	No	19,399	1,447	Not Available
2	July 28	Laguna Niguel Transmission Event	1.57	0.028	No	37,267	72	Not Available
3	August 25	Poway, Escondido, Cannon Sub - Load Curtailment	1.36	0.039	Yes	51,411	51	Not Available
4	February 18	February Storms	1.35	0.024	Yes	31,885	2,495	Not Available
5	July 23	Lightning Storm July	1.20	0.013	No	17,309	1,450	Not Available
6	October 6	Damaged OH Switch	0.89	0.004	No	5,226	468	Not Available
7	April 22	Poway Sub	0.89	0.008	No	10,896	108	Not Available
8	February 22	Vehicle Contact	0.82	0.003	No	4,143	310	Not Available
9	February 2	Feb 2nd storm	0.77	0.005	No	6,361	904	Not Available
10	January 3	January Storms	0.75	0.005	Yes	7,156	2,146	Not Available

<sup>\*</sup>Based on SAIDI impact.

#### **TEN LARGEST OUTAGE EVENTS IN 2004\***

Rank	Date	Description	SAIDI Impact	SAIFI Impact	CPUC Major Event?	Total Number of Customers Affected	Longest Customer Interruption (minutes)	Number of People Used to Restore Service
1	Dec. 28 - 31	December 2004 Storm	14.41	0.056	Yes	74,000	2,074	Not Available
2	Dec. 1	Substation - Equipment Failure	2.88	0.017	No	22,716	393	Not Available
3	Jun. 12	Substation - Animal Contact	2.16	0.011	No	14,708	204	Not Available
4	Jan. 23 - 24	Conductor Failure	1.88	0.003	No	3,951	625	Not Available
5	Sep. 30 - Oct. 1	Private Vehicle Contact	1.51	0.003	No	4,322	459	Not Available
6	Oct. 17 - 21	Storm / Winds	1.24	0.013	No	16,833	1,026	Not Available
7	Dec. 5	Private Vehicle Contact	1.14	0.005	No	6,292	276	Not Available
8	Dec. 5	Connector Failure	1.10	0.004	No	5,824	502	Not Available
9	Nov. 10	Transmission Equipment Failure	0.82	0.004	No	5,095	414	Not Available
10	Dec. 5 - 6	Storm / Winds	0.78	0.001	No	1,265	808	Not Available

<sup>\*</sup>Based on SAIDI impact.

# EXCLUDABLE IEEE MAJOR EVENT DAY DETAILS FOR 2014 EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS

				Cus	tomers I	nterrupte	ed - Hour	s Into the	Event C	ay*	
Date of Outage	Description of Outage	Total Number of Customers Out of Service	0	2	4	6	8	10	12	14	16
May 14	May Wind and Fire Storm	19,978	0	8	8	454	6,615	11,011	10,934	8,863	11,059
				Custome	rs Interru	pted - H	ours Into	the Eve	nt Day (c	ontinued	)
			18	20	22	24	26	28	30	32	34
			7,592	4,764	4,033	3,047	2,205	2,205	2,205	2,205	2,042
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			36	38	40	42	44	46	48	50	52
			497	495	492	492	194	194	194	194	139
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			54	56	58	60	62	64	66	68	70
			139	139	139	134	134	134	134	134	134
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			72	74	76	78	80	82	84	86	88
			134	132	132	132	132	132	132	132	132
				Custome	rs Interru	pted - H	ours Into	the Eve	nt Day (c	ontinued	)
			90	92	94	96	98	100	102	104	106
			132	44	44	20	0	0	0	0	0
	Lin the Core in a constant in the last all and				rs Interru			the Eve		ontinued	)

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

#### **EXCLUDABLE IEEE MAJOR EVENT DAY DETAILS FOR 2014**

				Cus	tomers I	nterrupte	d - Hour	s Into the	Event D	Day*	
Date of Outage	Description of Outage	Total Number of Customers Out of Service	0	1	2	3	4	5	6	7	8
September 16	September Heat and Rain Storm	21,743	55	35	191	9	9	188	188	188	188
				Custome	rs Interru	pted - He	ours Into	the Eve	nt Day (c	ontinued	)
			9	10	11	12	13	14	15	16	17
			471	471	650	433	6,767	7,927	8,043	7,764	37,468
				Custome	rs Interru	pted - He	ours Into	the Eve	nt Day (c	ontinued	)
			18	19	20	21	22	23	24	25	26
			12,401	12,464	12,047	11,915	10,622	10,735	7,011	6,242	2,952
				Custome	rs Interru	pted - He	ours Into	the Eve	nt Day (c	ontinued	)
			27	28	29	30	31	32	33	34	35
			2,210	1,348	1,289	636	473	289	204	204	204
				Custome	rs Interru	pted - He	ours Into	the Eve	nt Day (c	ontinued	)
			36	37	38	39	40	41	42	43	44
			161	150	150	150	150	150	150	150	1
				Custome	rs Interru	pted - He	ours Into	the Eve	nt Day (c	ontinued	)
			45	46	47	48	49	50	51	52	53
			1	1	1	1	1	1	1	1	1

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

#### **EXCLUDABLE IEEE MAJOR EVENT DAY DETAILS FOR 2013**

				Cus	tomers I	nterrupte	ed - Hour	s Into the	Event D	ay*	
Date of Outage	Description of Outage	Total Number of Customers Out of Service	0	1	2	3	4	5	6	7	8
July 18 - 19	Orange County Transmission Outage	124,579	24	24	24	0	0	0	0	31	24
			(	Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			9	10	11	12	13	14	15	16	17
			31	31	0	0	0	0	0	0	1,972
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			18	19	20	21	22	23	24	25	26
			2,036	930	298	264	250	122,753	122,753	122,722	122,722
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (c	ontinued	)
			27	28	29	30	31	32	33	34	35
			494	260	260	260	260	260	260	240	0

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

# EXCLUDABLE CPUC MAJOR EVENT DETAILS FOR 2012 EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS

There were no CPUC Major Events from 2012 to be extracted.

		Total Number	Customers Interrupted - Hours Into the Event Day*												
Date of Outage	Description of Outage	of Customers Out of Service	0	2	4	6	8	10	12	14	16				
September 8 - 9	Pacific Southwest Electrical Outage	1,387,249	0	0	0	0	0	0	0	0	1,387,249				
				Custo	mers Inter	rrupted - H	ours Into	the Event	Day (cont	inued)					
			18	20	22	24	26	28	30	32	34				
			1,387,249	1,373,940	1,204,968	842,831	201,230	2,310	761	765	0				

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

		Total Number		Cu	stomers I	nterrupte	ed - Hour	s Into the	e Event D	ay*	
Date of Outage	Description of Outage	of Customers Out of Service	0	2	4	6	8	10	12	14	16
January 18 - 22	Heavy Rain Storm	117,558	0	0	0	0	0	0	4,482	12,271	4,618
				Custome	rs Interru	ipted - H	ours Into	the Ever	nt Day (co	ontinued)	
			18	20	22	24	26	28	30	32	34
			4,974	884	568	491	492	489	483	565	110
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (co	ontinued)	
			36	38	40	42	44	46	48	50	52
			50,447	26,607	10,492	7,046	5,131	4,272	993	797	517
				Custome	rs Interru	ipted - H	ours Into	the Ever	nt Day (co	ontinued)	
			54	56	58	60	62	64	66	68	70
			269	279	115	91	8,380	4,603	2,138	754	753
					rs Interru	ipted - H	ours Into	the Ever	nt Day (co	ontinued)	
			72	74	76	78	80	82	84	86	88
			385	385	18,984	15,114	6,600	30,186	10,106	13,140	3,475
					rs Interru			_			
			90	92	94	96	98	100	102	104	106
			2,352	2,806	4,638	448	102	17,158	18,330	5,084	420
					rs Interru						
			108	110	112	114	116	118	120	122	124
			490	465	3,093	271	155	0	0	0	0

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

		Total Number		Cus	stomers I	nterrupte	ed - Hour	s Into the	Event D	ay*	
Date of Outage	Description of Outage	of Customers Out of Service	0	2	4	6	8	10	12	14	16
April 1	ISO ordered mandatory load	290,945									
	curtailment		290,945	0	0	0	0	0	0	0	0

		Total Number		Cu	stomers l	nterrupte	ed - Hour	s Into the	e Event D	ay*	
Date of Outage	Description of Outage	of Customers Out of Service	0	5	10	15	20	25	30	35	40
December 20 - 23	Heavy Rain Storm	31,376	0	110	5,326	12,271	7,252	4,618	2,769	4,974	2,983
				Custome	rs Interru	pted - H	ours Into	the Ever	nt Day (co	ontinued	
			45	50	55	60	65	70	75	80	85
			884	884	568	593	491	517	492	492	489
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (co	ontinued	
			90	95	100	105	110	115	120	125	130
			489	483	474	565	583	110	24,456	50,447	38,085
				Custome	rs Interru	ipted - H	ours Into	the Ever	nt Day (co	ontinued	
			135	140	145	150	155	160	165	170	175
			26,607	15,698	10,492	9,863	7,046	6,168	5,131	4,325	4,272
								_	<del></del>	ontinued	
			180	185	190	195	200	205	210	215	220
			3,146	993	967	797	793	517	780	269	269
				_						ontinued	
			225	230	235	240	245	250	255	260	265
			279	276	115	116	91	5,061	8,380	7,127	4,603
										ontinued)	
			270	275	280	285	290	295	300	305	310
			2,380	2,138	772	754	754	753	731	385	385
										ontinued)	
			315	320	325	330	335	340	345	350	355
			385	7,378	18,984	16,315	15,114	7,157	0	0	0

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

			Customers Interrupted - Hours Into the Event Day*									
Date of Outage	Description of Outage	Total Number of Customers Out of Service	2	4	6	8	10	12	14	16	18	
August 20 - 21	Vehicle Contact	5,031	0	0	0	0	0	0	0	0	0	
Customers Interrupted - Hours Into the Event Day (continu									ontinued)			
			20	22	24	26	28	30	32	34	36	
			0	5,031	2,958	1,102	1,102	1,102	1,102	1,102	1,102	
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (co	ontinued)		
			38	40	42	44	46	48	50	52	54	
	Had a factor and to be been		1,102	0	0	0	0	0	0	0	0	

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

#### **EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS**

There were no CPUC Major Events from 2008 to be extracted.

		Total Number		Cus	stomers I	nterrupte	ed - Hour	s Into the	e Event D	ay*			
		of Customers Out of Service											
Date of Outage	Description of Outage		0	5	10	15	20	25	30	35	40		
October 21 - November 24	Firestorm 2007 - Declaration of State of Emergency	74,088	0	0	994	5,847	1,439	4,016	26,645	25,770	23,560		
November 24	or Emergency		Customers Interrupted - Hours Into the Event Day (continued)										
			45	50	55	60	65	70	75	80	85		
			21,810	21,651	16,940	21,349	17,522	18,435	17,213	17,263	20,582		
				Custome		•			<u>, , , , , , , , , , , , , , , , , , , </u>		/		
			90	95	100	105	110	115	120	125	130		
			18,341	17,699	17,699	17,927	17,503	14,693	14,012	13,117	13,064		
				Custome									
			135	140	145	150	155	160	165	170	175		
			11,787	10,935	9,682	8,676	8,640	7,881	6,755	6,503	7,801		
				Custome									
			180	185	190	195	200	205	210	215	220		
			6,582	5,670	4,791	4,786	5,154	4,700	4,702	4,104	4,104		
				Custome									
			225	230	235	240	245	250	255	260	265		
			4,111	4,105	3,010	2,862	2,862	2,862	3,455	3,568	2,911		
			270	Custome 275	rs Interru 280	285	ours Into 290	295	300	305	310		
			2.725	2.986	3.008	2.303	2.303	2,358	2.277	3.211	1,946		
			, -	Custome	-,	,	,			- /			
			315	320	325	330	335	340	345	350	355		
			1,882	1,882	2,141	2,107	1,825	1,825	1,825	2,296	1,734		
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (co	ontinued)	)		
			360	365	370	375	380	385	390	395	400		
	d in the time increments include all cust		1,540	1,540	2,657	1,472	1,506	1,211	2,292	1,255	1,985		

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

<sup>\*\*</sup>The total customer impact as well as customers out of service for hours 35, 45, and 50 were inadvertently incorrectly reported and have since been corrected. This had no impact on the filed SAIDI, SAIFI, and MAIFI impacts for Non-CPUC events.

		Customers Interrupted - Hours Into the Event Day (continued)											
		Total Number of Customers											
Date of Outage	Description of Outage	Out of Service	405	410	415	420	425	430	435	440	445		
October 21 -	Firestorm 2007 - Declaration of State	74,088	1,036	987	987	994	861	721	721	811	692		
November 24	November 24 of Emergency (Continued)		Customers Interrupted - Hours Into the Event Day (continued)										
			450	455	460	465	470	475	480	485	490		
			883	410	410	456	504	225	225	225	216		
				Custome	rs Interru	ıpted - H	ours Into	the Eve	nt Day (co	ontinued)			
			495	500	505	510	515	520	525	530	535		
			49	9	6	6	6	6	6	6	6		
			Customers Interrupted - Hours Into the Event Day (continued)										
			540	545	550	555	560	565	570	575	580		
			31	31	6	6	6	6	6	6	6		
										ontinued)			
			585	590	595	600	605	610	615	620	625		
			6	6	6	6	6	6	6	6	6		
			630	Custome 635	rs Interru 640	upted - H	ours Into 650	the Ever	nt Day (co	ontinued) 665	670		
			6	6 Customo	6	6	6 ours Into	6	6	6 ontinued)	6		
			675	680	685	690	695	700	705	710	715		
			6	6	6	6	6	6	6	6	6		
			·	_	_	_				ontinued)	_		
			720	730	740	750	760	770	780	790	800		
			0	0	0	0	0	0	0	0	0		
				Custome	rs Interru	ipted - H	ours Into	the Eve	nt Day (co	ontinued)			
			810	815	820	825	830	835	840	845	850		
			0	30	30	60	0	0	0	0	0		

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

<sup>\*\*</sup>The total customer impact as well as customers out of service for hours 35, 45, and 50 were inadvertently incorrectly reported and have since been corrected. This had no impact on the filed SAIDI, SAIFI, and MAIFI impacts for Non-CPUC events.

		Total Number	Customers Interrupted - Hours Into the Event Day*										
Date of Outage	Description of Outage	of Customers Out of Service	2	4	6	8	10	12	14	16	18		
October 22	ISO Request - Load Curtailment	t 68,826	0	0	0	0	0	0	0	68,826	0		
	during Firestorm 2007		Customers Interrupted - Hours Into the Event Day (co										
			20	22	24	26	28	30	32	34	36		
			0	0	0	0	0	0	0	0	0		

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

# EXCLUDABLE CPUC MAJOR EVENT DETAILS FOR 2006 EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS

There were no CPUC Major Events from 2006 to be extracted.

Date of Outage Description of		Total Number		Cus	stomers I	nterrupt	ed - Hour	s Into the	e Event D	ay*			
	Description of Outage	of Customers Out of Service	2	4	6	8	10	12	14	16	18		
January 3 -	January Storms - Declaration of State	7,156	0	0	0	0	0	25	68	43	123		
January 13	of Emergency			Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (co	ontinued)			
			20	38	40	42	44	110	112	114	116		
			25	194	183	176	25	1,075	1,762	110	55		
Customers Interrupted - Hours Into the Event Day (conti							ontinued)						
			118	120	130	132	134	136	166	168	170		
			0	55	55	55	55	12	55	70	70		
					ers Interrupted - Hours Into the Event Day (continued)								
			172	174	176	178	180	182	184	186	194		
			0	110	820	0	0	0	0	55	25		
					rs Interru								
			196	198	200	202	204	206	208	210	212		
			1179	577	258	215	98	135	135	135	110		
					rs Interru	•							
			214	216	218	220	222	224	226	228	230		
			122	110	110	110	110	110	110	110	110		
					rs Interru	•							
			232	234	236	238	240	242	244	246	250		
			110	110	110	110	110	0	0	0	0		

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

\*\*The customers interrupted were inadvertently reported in the incorrect time slot in 2005. This table has been corrected in 2007; the adjustment had no affect on the reported SAIDI and SAIFI impacts for these events.

		Total Number		Cu	stomers I	nterrupt	ed - Hour	s Into the	e Event D	Day*	
Date of Outage Des	Description of Outage	of Customers Out of Service	2	4	6	8	10	22	32	34	36
February 18 -	February Storms - Declaration of State	31,885	0	0	155	52	226	25	36	1,506	608
February 25	of Emergency			Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (c	ontinued)	
			38	40	42	44	46	48	50	52	54
			204	188	1,008	31	31	31	19	19	129
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (c	ontinued)	
			56	58	60	62	64	66	68	70	72
			129	129	19	226	19	19	19	19	19
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (c	ontinued)	
			74	76	78	80	82	84	86	88	90
			19	19	19	19	19	110	199	72	41
				Custome	rs Interru	ıpted - H	ours Into	the Ever	nt Day (c	ontinued)	
			92	94	96	104	108	110	112	114	124
			8	63	1	25	8	8	62	62	5067
						-				ontinued)	
			126	128	130	132	134	160	162	164	166
			191	690	577	19	1	84	358	860	540
						-				ontinued)	
			168	170	172	174	176	178	180	182	184
			460	234	87	31	31	7	7	7	0

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

\*\*The customers interrupted were inadvertently reported in the incorrect time slot in 2005. This table has been corrected in 2007; the adjustment had no affect on the reported SAIDI and SAIFI impacts for these events.

#### **EXCLUDABLE CPUC MAJOR EVENT DETAILS FOR 2005**

#### **EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS\*\***

		Total Number		Cu	stomers l	nterrupte	ed - Hour	s Into the	e Event D	ay*	
Date of Outage	Description of Outage	of Customers Out of Service	2	4	6	8	10	12	14	16	18
August 25	ISO ordered mandatory load curtailment	51,411	0	0	0	0	0	0	0	51,411	0

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

<sup>\*\*</sup>The customers interrupted were inadvertently reported in the incorrect time slot in 2005. This table has been corrected in 2007; the adjustment had no affect on the reported SAIDI and SAIFI impacts for these events.

#### **EXCLUDABLE CPUC MAJOR EVENT DETAILS FOR 2004**

#### **EXTRACTED FROM THE TEN LARGEST OUTAGE EVENTS**

		Total Number		Cus	stomers I	nterrupte	ed - Hour	s Into the	Event D	ay*		
Date of Outage	Description of Outage	of Customers Out of Service	2	4	6	8	10	12	14	16	18	
	December Storm - Declaration of	74,000	0	0	0	31	3,725	5	30	1,381	48,480	
State of Emergency			Customers Interrupted - Hours Into the Event Day (continued)									
			20	22	24	26	28	30	32	34	36	
			36,187	26,037	18,190	11,941	7,393	5,017	3,093	1,372	709	
			Customers Interrupted - Hours Into the Event Day (continued)									
			38	40	42	44	46	48	50	52	54	
				411	159	91	36	36	50	34	7	6
				Custome	rs Interru	ipted - H	ours Into	the Ever	nt Day (co	ontinued		
			56	58	60	62	64	66	68	70	72	
			6	110	0	0	0	0	0	0	0	

<sup>\*</sup>Customers reflected in the time increments include all customers experiencing outages at that point in time. The event day begins at midnight.

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	Northeast	OK1	53
May	Eastern	440	96
June	Northeast/Eastern	OK1/440	149/97
July	Northeast/Eastern	OK1/440	149/97
August	Eastern	440	108
September	N/A	N/A	0
October	N/A	N/A	0
November	N/A	N/A	0
December	N/A	N/A	0

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	Eastern	79/444/445/1215	120/163/979/86
February	Eastern	444/445/1215	2/162/1
March	Eastern	444	142
April	Eastern	444/445	288/40
May	Eastern	444	2
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	Eastern	440	102
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	Eastern	444/445	4/358
June	Eastern	444/445	4/363
July	Eastern	444/445	4/362
August	Eastern	444/445/1215	62/898/86
September	Eastern	444/445/1215	62/985/86
October	Eastern	444/445/1215	24/985/86
November	Eastern	444/445/1215	163/980/86
December	Eastern	79/444/445/1215	120/163/980/86

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	Eastern	444	15
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	Northeast	221	290
November	Northeast/Eastern	221/444	289/15
December	Eastern	444	15

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None

Month	District	Circuit	Number of Customers Experiencing >12 Sustained Outages
January	N/A	N/A	None
February	N/A	N/A	None
March	N/A	N/A	None
April	N/A	N/A	None
May	N/A	N/A	None
June	N/A	N/A	None
July	N/A	N/A	None
August	N/A	N/A	None
September	N/A	N/A	None
October	N/A	N/A	None
November	N/A	N/A	None
December	N/A	N/A	None