



ANNUAL ELECTRIC RELIABILITY REPORT

For Year 2019

PREPARED FOR THE CALIFORNIA PUBLIC
UTILITIES COMMISSION

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Executive Summary

The reliability information contained in this report is for calendar year 2019, as required by California Public Utilities Commission (CPUC, or Commission) Decision 16-01-008. The data includes all outages (planned and unplanned) for distribution customers including and excluding Major Event Days (MED). SCE only excludes MEDs from the data where noted, and no other exclusions or exceptions were applied.

Unplanned outages and their calculated reliability indices are captured and calculated from our Outage Database and Reliability Metrics (ODRM) system.

As described in detail below, two metrics that are commonly relied on and reported in the electric utility industry are the System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI). Here, SAIDI measures the amount of time the average SCE customer experienced a power outage or interruption for more than five minutes (called a “sustained outage”) in a given year (with MED excluded). SAIFI is the number of times the average SCE customer experienced a sustained outage in a given year (with MED excluded). Please see below for detailed discussion and data reporting.

As noted in prior years’ reports, SCE began collecting Smart Meter data for calculating and reporting planned outage reliability indices. Beginning in 2016, SCE provided planned outage reliability indices for this report; 2016 was the first year where the entire year’s planned outage information was available.

The following content contained in this report is based on reliability indicators, definitions and calculations as defined below.

Major Event Day: A day in which the daily system SAIDI exceeds a threshold value. For purposes of calculating daily system SAIDI, any interruption that spans multiple calendar days is accrued to the day on which the interruption began. Statistically, days having a daily system SAIDI greater than a threshold value are days on which the energy delivery system experienced stresses beyond that normally expected (such as severe weather). Events are excluded based on the “2.5 beta method.” Per IEEE Standard 1366, days are excluded from a given year’s metric if their SAIDI exceeds 2.5 times the standard deviation of the natural logarithm of daily SAIDI over the previous five-year period.

ODRM: Outage Database and Reliability Metrics.

OMS: Outage Management System.

Sustained Interruption: Outage lasting longer than 5 minutes as defined in IEEE std. 1366-2003.

Momentary Interruption: Outage lasting 5 minutes or less as defined in IEEE std. 1366-2003.

SAIDI: The System Average Interruption Duration Index is the amount of time on average a customer was without power in a year due to sustained interruptions (measured in minutes per customer).

$$\text{SAIDI} = \frac{\text{sum of all "sustained" customer interruption durations}}{\text{total number of customers served}}$$

SAIFI: The System Average Interruption Frequency Index is the number of times an average customer was without power in a year due to service interruptions lasting more than 5 minutes (measured in interruptions per customer).

$$\text{SAIFI} = \frac{\text{sum of total quantity of "sustained" customer interruptions}}{\text{total number of customers served}}$$

MAIFI: The Momentary Average Interruption Frequency Index is the number of times an average customer was without power in a year due to service interruptions lasting 5 minutes or less (measured in interruptions per customer)

$$\text{MAIFI} = \frac{\text{sum of total quantity of "momentary" customer interruptions}}{\text{total number of customers served}}$$

T_{MED}: The calculated threshold value used to determine a Major Event Day. SCE's T_{MED} value is calculated at the beginning of each year using SCE's daily SAIDI values for the prior 5 years. SCE's T_{MED} value for 2019 was 1.76 min.¹

In years 2006 - 2010, SCE calculated SAIDI, SAIFI, and MAIFI per IEEE 1366 with the exception of using five years of historical data in applying the "2.5 beta method" to determine excludable days. Per IEEE 1366, days are excluded from a given year's metric if their SAIDI exceeds 2.5 times the standard deviation of the natural logarithm of daily SAIDI over the previous five-year period. SCE did not have complete ODRM data prior to 2006.

The interim approach was consistent with IEEE 1366 and excludable days were as follow:

- 2006 and 2007 were both determined based on daily SAIDI data in year 2006.
- 2008 were determined based on daily SAIDI data in years 2006 and 2007.
- 2009 were determined based on daily SAIDI data in years 2006, 2007, and 2008.
- 2010 were determined based on daily SAIDI data in years 2006, 2007, 2008, and 2009.

¹ For the year 2018, SCE's T_{MED} should be 1.65 min.

SCE 2019 Performance Summary

SCE's 2019 performance was impacted compared to 2018, largely due to a substantial increase in unplanned outages stemming from our wildfire-related enhanced overhead inspections.

SCE continues to look for ways to improve its reliability performance, with a particular focus on reducing restoration times by improving processes for operations response, lessening customer impact through real-time outage diagnostics, and enhancing infrastructure by automating Remote Re-closer Settings.

As part of SCE's efforts to continuously improve its reliability performance, for its 2019 data SCE applied a new and more refined process and algorithms to generate the planned outage reliability reporting information. Based on the results obtained using this new process, SCE believes that in prior years (2016-2018), SCE's reported planned outage SAIDI figures may have been overstated to some degree. In other words, the planned outage SAIDI reporting in those three prior years may contain reported numbers that show SCE's planned outage reliability as lower (or having a lesser level of reliability) than the actual outage reliability. Any error or differential here was not in SCE's favor. Because the underlying detailed information that is used to develop the planned outage SAIDI information is no longer stored in SCE's databases, SCE cannot go back and apply the new and more refined process to prior years to recalculate the planned outage SAIDI (Retention of the prior years' detailed underlying information was not required by any regulation or regulatory guidance). SCE intends to utilize its new process in forthcoming years of this Annual System Reliability Report.

The table below summarizes SCE's 2019 performance for unplanned outages including and excluding MED. The table also consists of a 10-year average performance for unplanned outages including and excluding MED for comparison.

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2019	177.97	1.04	1.38	171.17	90.75	0.87	1.23	104.75
10 Year Avg (2010-2019)	140.00	1.00	1.48	140.08	95.82	0.86	1.31	110.87

In addition, in late 2018, SCE implemented proactive de-energization known as Public Safety Power Shutoff (PSPS). PSPS is an operational protocol that SCE implements under extreme weather conditions in order to minimize the threat of wildfires and keep communities safe from potentially dangerous situations. Implementation of restricted circuit operation during the protocol are situations where high fire areas are experiencing adverse weather or public safety is at risk.

During 2019, there were several National Weather Service Red Flag Warnings and High Fire Ignition Fuel indicators that had been identified throughout SCE's territory. As a result, SCE's incident Management Team (IMT) notified appropriate agencies and activated the necessary resources as protocol for early warning response. Because PSPS events may require de-energization of one or more circuits during an IMT activation, this can have a negative impact on SAIDI and SAIFI indices.

Total System Indices excluding MED and PSPS are shown in the below table.

Total Unplanned System Reliability excluding MED and PSPS				
YEAR	SAIDI	SAIFI	MAIFI	CAIDI
2019	89.28	0.86	1.23	103.22

In 2019, SCE experienced outage events across its territory, some of which impacted reliability to result in MEDs. In total, SCE had 15 MEDs. Please see the below summary table of Major Event Days.²

No.	Date	Cause	SAIDI	SAIFI	Sustained Customer Impacted	MAFI	Momentary Customer Impacted	Excluded per IEEE 1366
1	2/2/2019	OTHER-SEE NOTES, NO CAUSE FOUND,VEGETATION BLOWN	2.183	0.014	73,939	0.031	158,115	Y
2	2/14/2019	UNKNOWN, OTHER-SEE NOTES,NO CAUSE FOUND	2.053	0.016	83,856	0.022	113,472	Y
3	4/9/2019	OTHER-SEE NOTES, WIND,NO CAUSE FOUND	1.848	0.011	59,118	0.021	109,107	Y
4	8/2/2019	OTHER-SEE NOTES, LOST,UNKNOWN	4.460	0.006	30,635	0.004	20,987	Y
5	9/16/2019	OTHER-SEE NOTES, UNKNOWN,PUB. SAFETY POWER SHUTDOWN	2.772	0.005	24,759	0.001	3,379	Y
6	10/5/2019	UNKNOWN, OTHER-SEE NOTES,BALLOON	1.815	0.004	22,148	0.005	27,545	Y
7	10/10/2019	OTHER-SEE NOTES, PUB. SAFETY POWER SHUTDOWN,NO CAUSE FOUND	8.021	0.010	51,051	0.004	19,748	Y
8	10/24/2019	OTHER-SEE NOTES, PUB. SAFETY POWER SHUTDOWN,VEGETATION BLOWN	9.668	0.011	56,079	0.005	26,651	Y
9	10/28/2019	OTHER-SEE NOTES, PUB. SAFETY POWER SHUTDOWN,OPEN FOR REPAIRS	3.602	0.008	41,855	0.005	27,172	Y
10	10/29/2019	OTHER-SEE NOTES, NO CAUSE FOUND,OPEN FOR REPAIRS	1.849	0.004	23,153	0.004	21,622	Y
11	10/30/2019	PUB. SAFETY POWER SHUTDOWN, OTHER-SEE NOTES,VEGETATION BLOWN	28.164	0.028	141,712	0.004	22,211	Y
12	11/28/2019	OTHER-SEE NOTES, NO CAUSE FOUND,UNKNOWN	9.944	0.015	79,184	0.021	109,994	Y
13	11/29/2019	OTHER-SEE NOTES, VEGETATION BLOWN,NO CAUSE FOUND	3.221	0.011	57,417	0.004	21,922	Y
14	12/26/2019	UNKNOWN, OTHER-SEE NOTES,NO CAUSE FOUND	5.304	0.023	119,644	0.017	89,410	Y
15	12/27/2019	UNKNOWN, OTHER-SEE NOTES,OPEN FOR REPAIRS	2.317	0.005	28,310	0.002	12,451	Y
	Total		87.221	0.173	892,860	0.152	783,786	Y

² Not all PSPS de-energization events will result in MEDs.

SECTION 1 – SYSTEM INDICES FOR THE LAST 10 YEARS

a. System Indices Tables

Table 1 below contains the required SAIDI, SAIFI, MAIFI³ and CAIDI indices for 2010-2019 including and excluding Major Event Day (MED) for the SCE System unplanned Outages. All calculations contained in the table are based on the IEEE 1366 method for Major Event Day (MED). Reliability indices are for unplanned outages only.

Table 1 – Unplanned Outage System Indices (2010-2019)

YEAR	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2010	140.91	1.05	1.69	134.56	98.69	0.82	1.41	120.99
2011	232.39	1.04	1.53	223.75	108.15	0.91	1.36	118.30
2012	108.13	0.89	1.43	121.10	100.70	0.86	1.35	117.76
2013	102.61	0.91	1.20	112.76	94.48	0.88	1.18	107.85
2014	112.10	0.97	1.36	116.04	92.30	0.86	1.23	106.82
2015	114.83	0.92	1.42	125.40	100.15	0.86	1.29	116.56
2016	134.48	1.10	1.55	122.26	109.98	0.99	1.40	110.69
2017	139.73	1.19	1.84	117.19	91.72	0.87	1.42	105.40
2018	136.82	0.87	1.43	156.61	71.25	0.72	1.27	99.58
2019	177.97	1.04	1.38	171.17	90.75	0.87	1.23	104.75

i. Distribution Indices⁴

Table 2 – Unplanned Outage Distribution Indices (2010-2019)

YEAR	Distribution Indices (< 50KV) (All Interruptions Included)				Distribution Indices (< 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2010	139.01	1.01	1.61	138.12	97.52	0.79	1.34	124.04
2011	228.08	0.98	1.47	233.02	105.64	0.86	1.31	122.59
2012	105.58	0.88	1.35	120.63	98.30	0.84	1.28	117.06
2013	94.33	0.86	1.14	109.27	92.52	0.85	1.12	108.46
2014	111.08	0.94	1.29	117.64	91.52	0.84	1.17	108.52
2015	111.87	0.88	1.35	127.54	98.34	0.83	1.24	118.88
2016	129.32	1.05	1.47	123.24	106.29	0.95	1.33	112.03
2017	128.74	0.99	1.56	130.69	89.99	0.84	1.37	106.71
2018	134.87	0.86	1.39	156.34	70.81	0.71	1.23	99.70
2019	170.30	1.01	1.32	169.33	89.33	0.85	1.18	105.37

³ SCE calculates MAIFI at every individual outage event.

⁴ Distribution system outages are defined as outages that are <50kV.

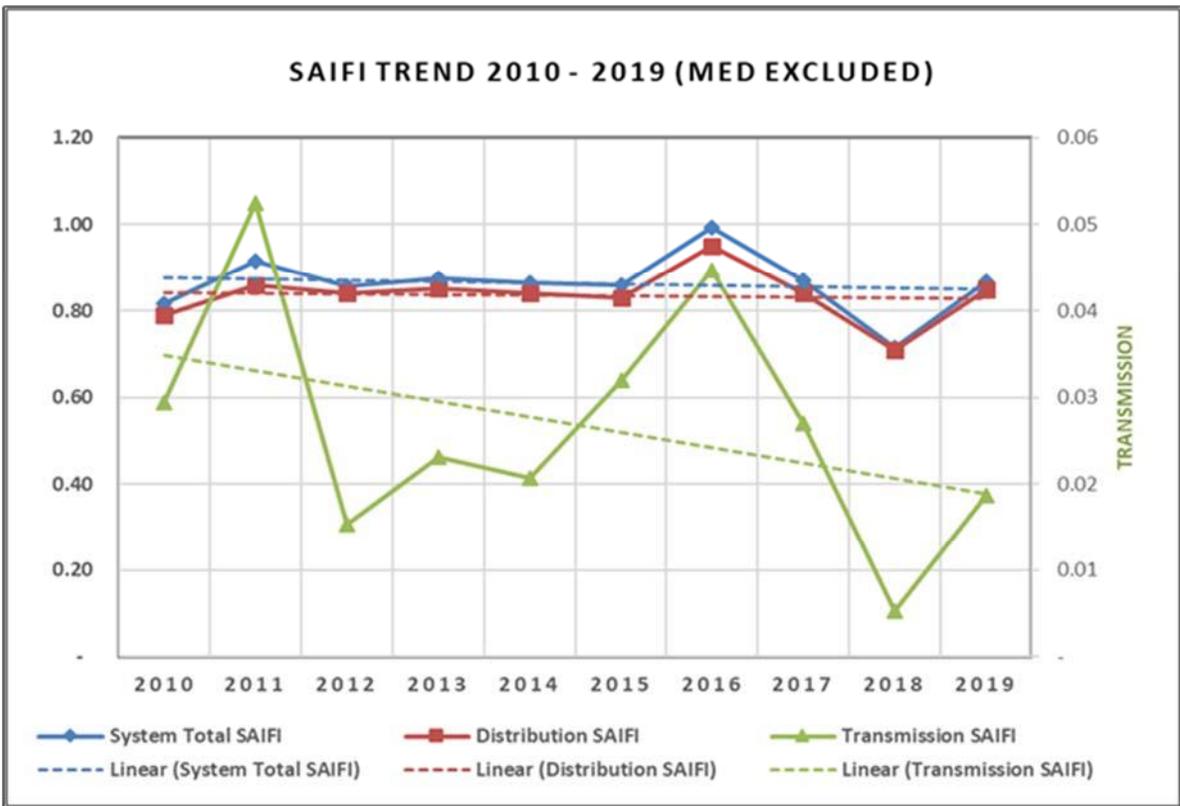
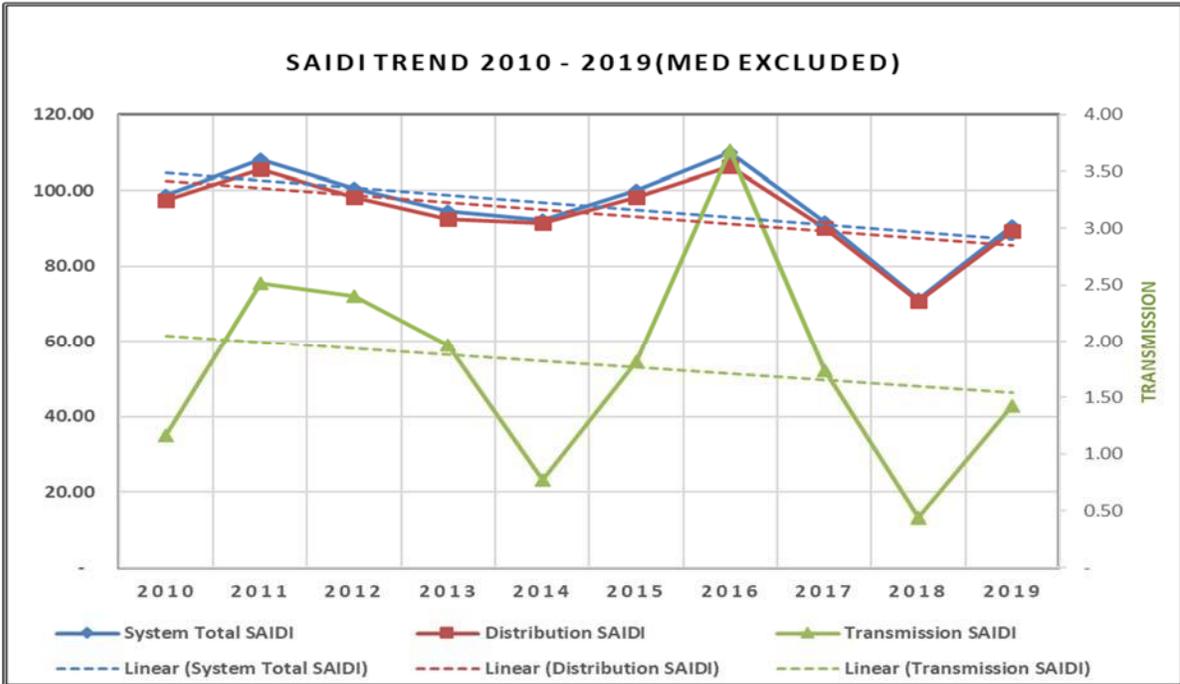
ii. Transmission Indices⁵

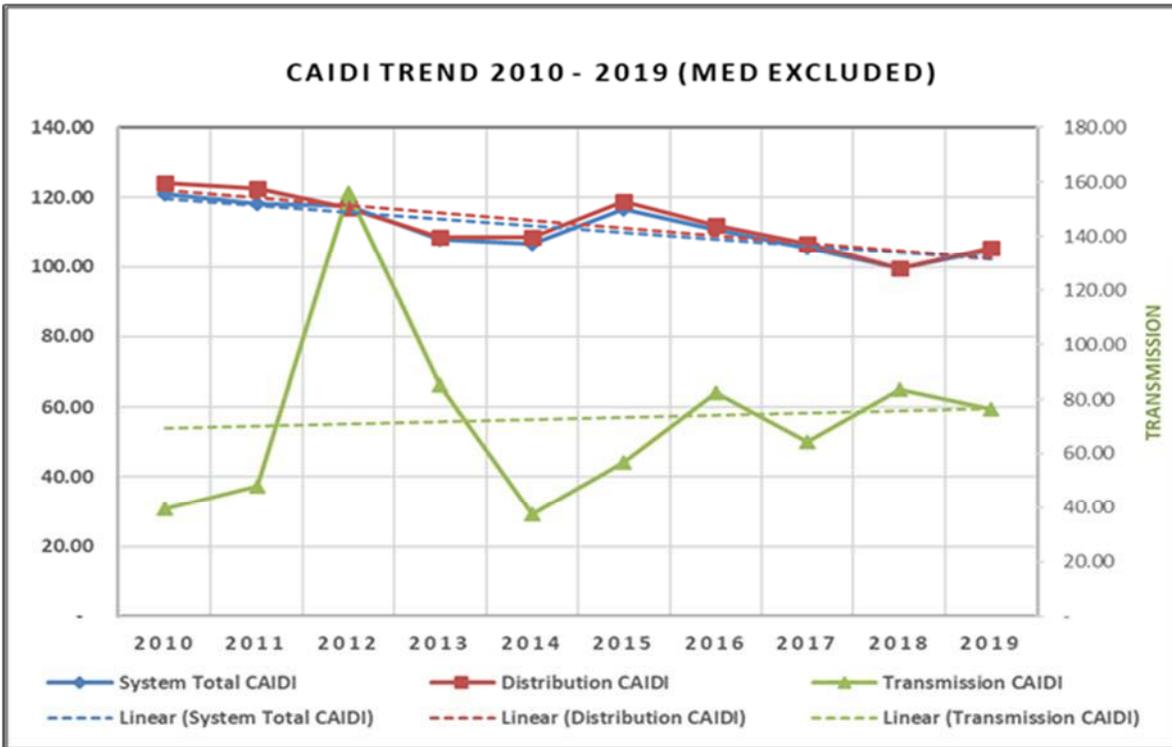
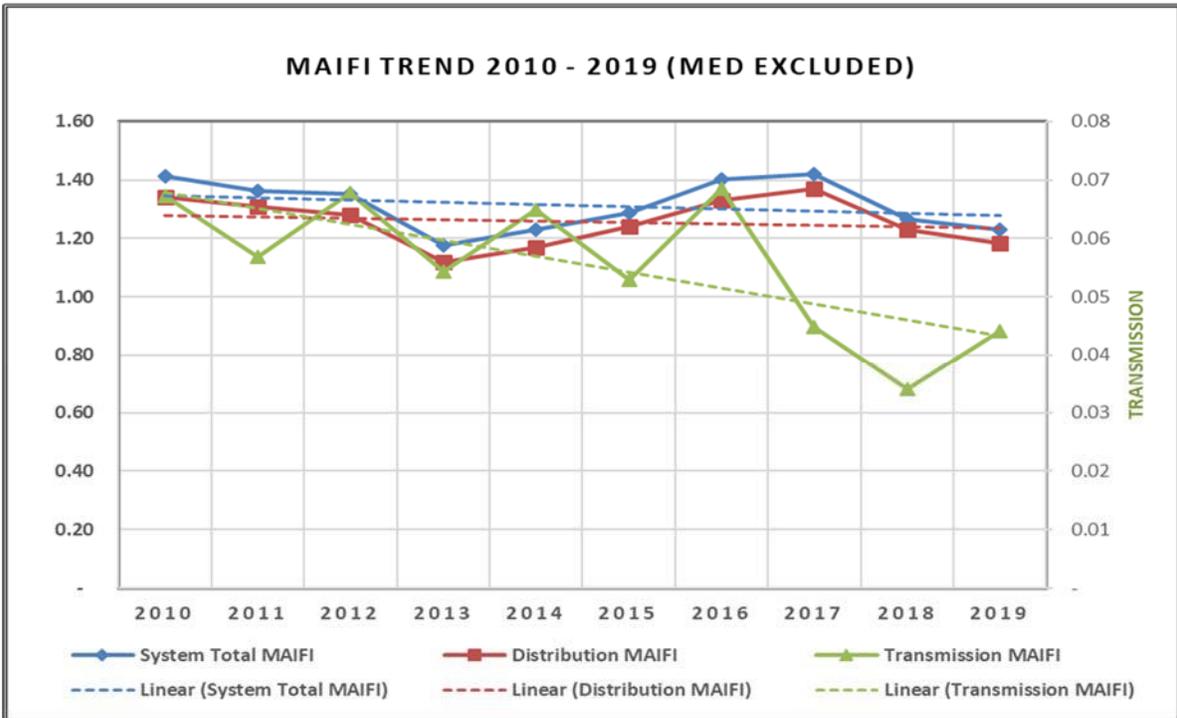
Table 3 – Unplanned Outage Transmission Indices (2010-2019)

YEAR	Transmission Indices (>= 50KV) (All Interruptions Included)				Transmission Indices (>= 50KV) (Major Event Days Excluded)			
	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2010	1.90	0.04	0.08	46.64	1.16	0.03	0.07	39.54
2011	4.31	0.06	0.07	72.06	2.51	0.05	0.06	47.91
2012	2.56	0.02	0.08	143.93	2.40	0.02	0.07	155.92
2013	8.29	0.05	0.06	177.25	1.97	0.02	0.05	85.29
2014	1.02	0.02	0.07	46.82	0.78	0.02	0.06	37.50
2015	2.96	0.04	0.07	76.68	1.82	0.03	0.05	56.75
2016	5.15	0.05	0.08	101.92	3.68	0.04	0.07	82.39
2017	10.99	0.21	0.27	53.01	1.74	0.03	0.04	64.31
2018	1.95	0.01	0.04	177.73	0.44	0.01	0.03	83.54
2019	7.67	0.03	0.06	225.95	1.43	0.02	0.04	76.39

⁵ Transmission system outages are defined as outages ≥ 50 kV.

b. Unplanned Outage System Indices Charts (MED Excluded)





SECTION 2 – UNPLANNED OUTAGE DISTRICT RELIABILITY INDICES FOR THE PAST 10 YEARS INCLUDING AND EXCLUDING MED

a. District SAIDI, SAIIFI, MAIFI and CAIDI⁶ (including and excluding MED) for unplanned outages

Table 4 – District Indices (2010-2019)⁷

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
ANTELOPE VALLEY								
2010	131.063	0.773	2.022	169.484	74.576	0.524	1.321	142.319
2011	208.159	1.247	1.669	166.965	128.137	1.144	1.595	111.981
2012	78.604	0.565	1.428	139.172	76.461	0.549	1.412	139.354
2013	94.416	0.619	1.172	152.621	94.222	0.613	1.166	153.772
2014	50.956	0.593	1.153	85.927	45.595	0.548	1.070	83.156
2015	104.337	0.680	1.838	153.528	70.206	0.601	1.514	116.783
2016	107.670	0.870	1.523	123.791	101.199	0.814	1.430	124.322
2017	103.191	0.873	1.833	118.151	83.352	0.814	1.704	102.390
2018	55.614	0.608	1.258	91.517	50.419	0.534	1.097	94.498
2019	194.754	0.668	1.347	291.498	76.406	0.569	1.249	134.164
ARROWHEAD								
2010	537.400	3.841	18.875	139.895	229.659	1.974	16.782	116.369
2011	792.792	4.403	6.090	180.074	444.698	2.992	5.736	148.605
2012	129.579	1.307	3.972	99.116	89.043	1.043	3.757	85.372
2013	180.586	1.386	5.017	130.286	134.768	1.174	3.637	114.839
2014	193.249	1.590	4.018	121.532	81.968	0.898	3.035	91.277
2015	362.615	3.973	5.595	91.273	186.743	2.755	2.730	67.794
2016	659.464	2.848	5.951	231.515	200.720	1.883	4.712	106.593
2017	816.518	3.861	7.057	211.496	218.331	3.058	4.093	71.391
2018	68.595	1.527	2.980	44.924	53.422	0.712	2.919	75.065
2019	3630.637	9.592	9.883	378.500	828.270	5.814	6.160	142.452
BARSTOW								
2010	123.015	1.511	3.041	81.440	96.881	1.190	2.648	81.400
2011	308.760	1.631	6.115	189.288	271.659	1.549	5.735	175.418
2012	184.797	1.152	2.645	160.377	182.786	1.144	2.524	159.819
2013	204.329	1.395	3.284	146.469	185.788	1.286	2.702	144.416
2014	201.526	1.343	2.536	150.058	173.680	1.240	2.410	140.098
2015	187.113	1.174	2.859	159.416	157.379	0.997	2.131	157.841
2016	134.828	1.350	2.296	99.888	130.085	1.340	2.283	97.106
2017	357.468	2.652	4.195	134.806	356.064	2.639	4.132	134.934
2018	116.698	1.373	2.110	84.988	115.274	1.342	2.077	85.929
2019	114.490	0.833	2.586	137.432	95.228	0.798	2.188	119.296
BISHOP								
2010	407.920	2.502	5.664	163.016	293.294	2.332	4.251	125.792
2011	666.064	1.548	2.571	430.339	105.588	1.344	2.247	78.591
2012	463.093	1.248	2.288	371.138	424.766	1.103	2.205	384.980
2013	104.436	0.514	1.267	203.233	104.425	0.514	1.267	203.232
2014	118.793	0.587	1.885	202.475	113.618	0.499	1.706	227.572
2015	298.106	2.218	3.332	134.431	298.106	2.218	3.272	134.431
2016	168.592	1.216	2.820	138.643	168.530	1.216	2.711	138.603
2017	190.511	1.934	3.223	98.485	172.144	1.877	3.077	91.719
2018	139.695	0.539	1.957	258.986	136.470	0.499	1.820	273.587
2019	1445.727	2.915	3.217	496.014	276.151	1.394	2.878	198.130
BLYTHE								
2010	1332.781	2.030	2.817	656.668	294.445	1.344	2.641	219.114
2011	378.393	1.402	3.717	269.845	321.050	1.312	3.443	244.767
2012	225.884	1.529	3.749	147.714	221.814	1.498	3.749	148.058
2013	483.127	1.380	5.466	349.971	482.815	1.372	5.382	351.779
2014	707.218	2.417	4.658	292.632	706.974	2.385	4.433	296.395
2015	426.997	1.515	1.396	281.754	331.521	1.129	1.163	293.751
2016	396.376	2.707	6.342	146.428	302.983	1.917	4.848	158.021
2017	684.484	2.377	3.585	287.955	683.564	2.372	3.493	288.176
2018	277.723	1.571	2.198	176.833	255.608	1.321	2.168	193.449
2019	379.850	1.692	2.769	224.482	359.998	1.629	2.675	221.030

⁶ dSAIDI, dSAIFI, dMAIFI and dCAIDI are calculated utilizing the district CMI/district customers.

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
COMPTON								
2010	119.230	0.779	1.578	153.004	88.110	0.585	1.337	150.626
2011	109.414	0.718	1.566	152.338	90.548	0.644	1.433	140.680
2012	117.225	0.824	1.863	142.330	110.077	0.792	1.830	139.031
2013	89.167	0.797	1.938	111.893	89.167	0.797	1.938	111.893
2014	82.192	0.711	1.603	115.553	73.493	0.656	1.560	111.977
2015	130.629	0.967	2.049	135.097	126.046	0.934	1.958	134.903
2016	146.384	1.107	2.537	132.203	127.155	1.010	2.229	125.937
2017	123.596	0.826	2.162	149.564	86.630	0.720	1.967	120.388
2018	93.365	0.852	2.447	109.544	66.378	0.718	2.266	92.400
2019	98.658	0.874	2.090	112.865	64.548	0.706	1.721	91.403
COVINA								
2010	117.660	0.810	1.130	145.299	99.323	0.708	0.983	140.232
2011	166.969	0.870	1.181	191.870	86.994	0.736	1.077	118.129
2012	108.732	0.915	1.333	118.824	102.888	0.867	1.267	118.680
2013	100.505	0.856	1.004	117.414	100.297	0.853	0.992	117.582
2014	91.418	0.874	1.257	104.580	81.424	0.804	1.028	101.295
2015	100.085	0.815	1.164	122.866	99.838	0.813	1.152	122.755
2016	112.134	0.974	1.319	115.182	90.930	0.875	1.145	103.915
2017	117.185	0.933	1.366	125.558	106.094	0.813	1.139	130.523
2018	103.181	0.832	1.455	124.043	73.463	0.700	1.367	104.983
2019	84.296	0.864	0.999	97.598	76.846	0.800	0.923	96.037
FOOTHILL								
2010	76.599	0.460	0.975	166.649	64.982	0.405	0.857	160.634
2011	117.405	0.955	1.226	122.901	97.462	0.879	0.896	110.915
2012	91.694	0.903	0.931	101.552	91.479	0.900	0.900	101.608
2013	85.800	0.787	0.987	109.087	85.800	0.787	0.987	109.087
2014	93.337	0.932	1.285	100.140	88.135	0.861	1.249	102.395
2015	109.637	0.947	1.304	115.764	87.796	0.890	1.230	98.673
2016	142.807	1.028	1.507	138.926	138.177	1.008	1.483	137.029
2017	110.528	1.118	1.387	98.876	88.001	0.890	1.213	98.910
2018	117.614	0.976	1.202	120.475	78.703	0.782	0.966	100.705
2019	273.472	1.050	1.108	260.359	69.021	0.796	1.069	86.733
FULLERTON								
2010	135.217	1.186	1.208	113.985	94.282	0.671	0.859	140.606
2011	90.110	0.607	1.076	148.499	88.745	0.604	1.075	146.940
2012	68.992	0.419	0.943	164.469	64.428	0.401	0.878	160.539
2013	90.572	0.793	0.910	114.158	90.572	0.793	0.910	114.158
2014	82.201	0.723	1.004	113.714	69.996	0.649	0.974	107.848
2015	76.586	0.669	1.014	114.471	75.504	0.642	0.995	117.681
2016	92.725	0.760	1.174	122.044	73.772	0.588	0.974	125.369
2017	89.287	0.676	1.211	132.085	74.154	0.584	1.084	126.996
2018	69.447	0.517	1.126	134.276	55.382	0.435	1.041	127.367
2019	82.337	0.776	1.092	106.133	73.013	0.710	1.023	102.844
HUNTINGTON BEACH								
2010	128.850	1.028	1.299	125.336	101.190	0.855	1.026	118.377
2011	121.939	0.982	1.507	124.158	114.002	0.911	1.426	125.083
2012	95.604	0.887	1.043	107.743	94.511	0.880	1.043	107.404
2013	66.914	0.703	0.839	95.123	66.914	0.703	0.839	95.123
2014	77.109	0.774	1.105	99.638	65.695	0.712	0.978	92.256
2015	97.731	0.969	1.235	100.904	93.570	0.942	1.187	99.287
2016	127.358	1.287	1.245	98.938	107.706	1.212	1.184	88.869
2017	98.780	0.972	1.458	101.647	78.932	0.852	1.190	92.648
2018	88.268	0.778	1.376	113.405	74.272	0.696	1.076	106.706
2019	97.176	1.011	1.145	96.129	81.299	0.889	0.973	91.406
KERNVILLE								
2010	584.742	1.795	4.336	325.686	444.191	1.490	4.011	298.084
2011	165.695	1.025	3.316	161.713	138.134	0.964	2.620	143.346
2012	226.761	1.311	3.636	172.995	160.694	1.066	3.010	150.692
2013	232.181	1.964	4.925	118.189	180.865	1.577	4.824	114.682
2014	178.691	1.987	1.882	89.932	142.946	1.918	1.831	74.541
2015	286.382	0.961	1.630	297.920	231.411	0.857	1.293	270.120
2016	2421.324	3.674	2.928	659.034	909.188	2.839	2.832	320.212
2017	305.533	3.286	4.508	92.982	290.601	3.148	4.210	92.311
2018	184.411	1.141	3.104	161.652	152.818	1.009	3.087	151.390
2019	320.174	1.669	3.964	191.871	317.537	1.663	3.961	190.886

⁷ For 2010 – 2019, Catalina District indices have been combined with Huntington Beach District since the Catalina District operations have been combined with the Huntington Beach District.

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
LONG BEACH								
2010	72.284	0.633	0.897	114.156	53.982	0.546	0.774	98.809
2011	58.475	0.579	0.894	100.942	52.380	0.562	0.853	93.191
2012	75.830	0.554	1.106	136.864	72.654	0.536	1.059	135.673
2013	75.107	0.699	0.779	107.497	74.628	0.694	0.775	107.551
2014	66.226	0.606	1.168	109.270	57.781	0.548	1.083	105.376
2015	164.463	0.894	1.185	183.904	89.160	0.846	1.168	105.378
2016	135.163	0.857	1.308	157.701	96.978	0.695	1.095	139.507
2017	77.173	0.708	1.177	108.967	59.503	0.590	1.017	100.881
2018	51.477	0.445	1.223	115.686	42.300	0.400	1.100	105.879
2019	78.184	0.643	0.965	121.652	60.171	0.572	0.818	105.248
MENIFEE								
2010	100.653	0.762	1.202	132.119	74.081	0.613	0.903	120.754
2011	100.482	0.891	1.339	112.728	93.705	0.804	1.299	116.607
2012	99.320	0.838	1.736	118.576	98.627	0.824	1.680	119.740
2013	107.388	1.264	0.744	84.979	106.298	1.220	0.725	87.135
2014	156.641	1.323	1.573	118.410	77.367	1.004	1.276	77.030
2015	111.460	0.978	1.302	113.971	85.322	0.876	1.067	97.393
2016	156.748	1.311	1.448	119.535	139.005	1.191	1.338	116.738
2017	130.467	0.965	1.311	135.265	72.854	0.765	1.200	95.225
2018	174.057	0.897	1.436	194.002	70.952	0.696	1.270	102.015
2019	99.483	0.859	1.027	115.814	76.890	0.750	0.860	102.488
MONROVIA								
2010	124.340	1.078	2.014	115.381	93.507	0.902	1.775	103.624
2011	2414.044	1.891	2.463	1276.874	130.692	1.025	1.740	127.514
2012	108.110	1.126	1.781	95.987	99.185	1.068	1.632	92.910
2013	99.116	1.017	1.322	97.496	98.965	1.015	1.311	97.500
2014	133.311	1.157	1.258	115.176	96.360	1.005	1.069	95.846
2015	96.679	0.881	1.618	109.737	95.327	0.863	1.554	110.466
2016	116.575	0.844	1.652	138.064	93.387	0.772	1.523	121.000
2017	105.003	0.982	1.797	106.955	91.997	0.925	1.699	99.414
2018	243.023	1.427	1.614	170.294	102.583	1.030	1.453	99.573
2019	86.095	0.824	1.399	104.506	75.962	0.724	1.239	104.947
MONTEBELLO								
2010	147.851	1.117	1.987	132.361	118.232	0.972	1.688	121.649
2011	678.332	1.214	2.388	558.556	115.694	0.853	1.821	135.577
2012	131.058	1.127	1.946	116.316	107.511	1.040	1.823	103.423
2013	118.078	1.174	1.890	100.609	117.713	1.169	1.890	100.660
2014	158.316	1.164	1.959	136.010	124.669	1.020	1.763	122.179
2015	150.280	1.183	2.213	126.992	145.303	1.131	2.087	128.462
2016	133.522	1.166	2.057	114.552	107.263	1.043	1.882	102.871
2017	123.980	0.989	2.181	125.388	96.853	0.877	1.873	110.467
2018	160.883	1.063	2.269	151.313	98.880	0.782	1.859	126.380
2019	127.517	1.176	1.906	108.427	108.382	1.042	1.789	104.046
ONTARIO								
2010	90.448	0.811	1.480	111.528	70.279	0.655	1.258	107.242
2011	117.664	0.822	1.317	143.189	96.594	0.749	1.235	128.944
2012	93.087	0.869	1.159	107.130	91.407	0.833	1.140	109.720
2013	77.392	0.791	0.933	97.841	74.037	0.782	0.926	94.728
2014	97.881	0.996	1.160	98.312	86.676	0.902	1.041	96.114
2015	94.043	0.744	0.926	126.432	81.608	0.709	0.867	115.156
2016	105.067	0.930	1.282	112.936	86.158	0.803	1.095	107.337
2017	100.432	1.135	1.572	88.514	91.781	1.054	1.422	87.094
2018	80.041	0.723	1.048	110.711	53.434	0.589	0.918	90.776
2019	90.157	0.943	1.211	95.597	76.942	0.864	1.145	89.046
PALM SPRINGS								
2010	180.688	1.039	1.367	173.826	162.059	0.940	1.148	172.391
2011	164.765	0.886	1.182	186.029	144.131	0.842	1.117	171.272
2012	175.916	1.267	1.505	138.814	113.848	1.130	1.236	100.717
2013	112.796	0.774	0.997	145.669	112.193	0.769	0.997	145.815
2014	106.960	0.708	0.941	151.072	95.065	0.667	0.885	142.620
2015	99.542	0.800	1.042	124.376	95.795	0.753	0.949	127.171
2016	107.581	1.066	1.281	100.909	101.363	1.010	1.133	100.351
2017	119.105	1.022	1.220	116.564	116.436	0.998	1.210	116.632
2018	73.949	0.788	1.426	93.794	60.306	0.726	1.208	83.104
2019	133.770	1.233	1.623	108.492	91.606	0.915	1.298	100.088

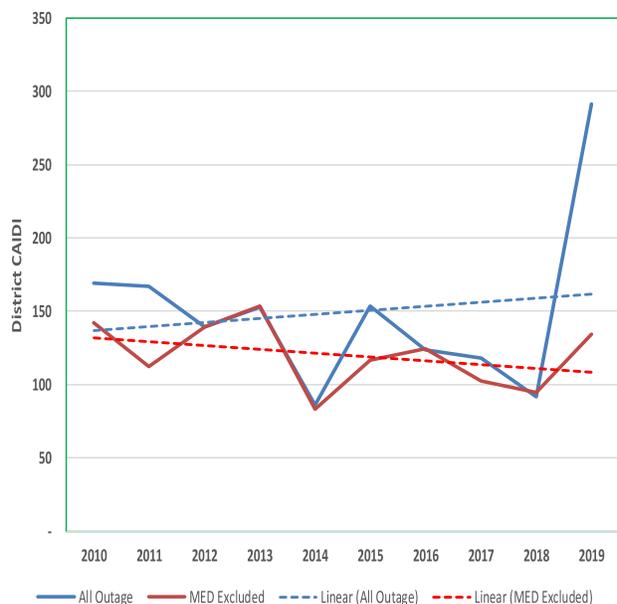
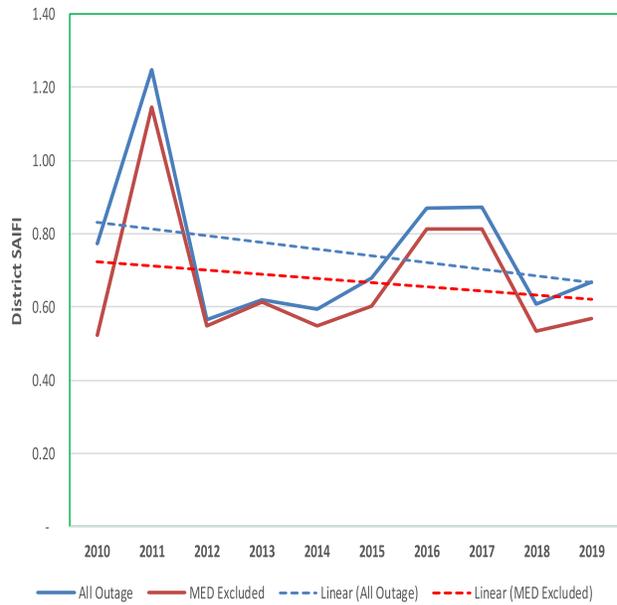
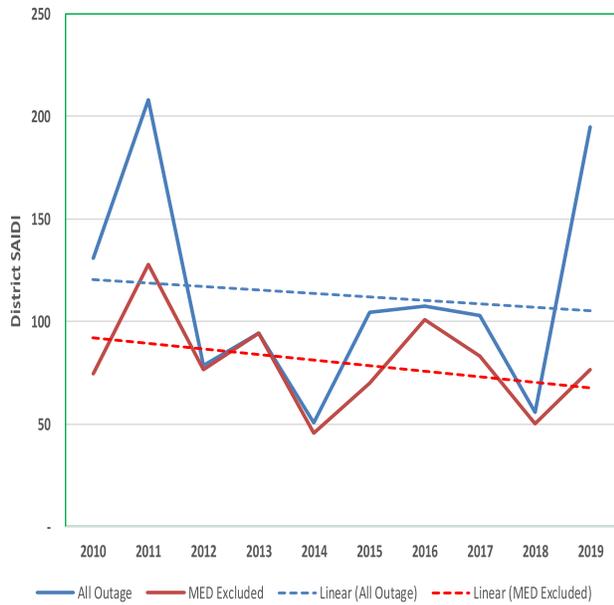
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
REDLANDS								
2010	216.759	1.692	3.207	128.121	95.898	1.332	2.692	71.988
2011	253.703	1.630	1.323	155.689	142.273	1.428	1.244	99.628
2012	120.127	1.108	1.600	108.399	114.781	1.068	1.563	107.435
2013	96.481	1.044	0.911	92.410	95.273	1.036	0.908	91.977
2014	154.227	1.040	1.312	148.311	85.520	0.872	1.149	98.024
2015	124.519	1.012	1.467	122.990	102.289	0.935	1.247	109.365
2016	137.110	0.978	1.475	140.164	118.776	0.883	1.336	134.494
2017	142.591	1.009	1.595	141.350	112.447	0.856	1.407	131.325
2018	88.933	0.973	1.367	91.372	71.012	0.833	1.212	85.242
2019	215.229	1.275	1.407	168.810	104.260	0.970	1.243	107.496
RIDGECREST								
2010	153.378	1.410	2.219	108.746	151.176	1.394	1.850	108.443
2011	89.261	0.737	4.140	121.196	67.647	0.528	3.916	128.124
2012	229.646	1.439	3.738	159.634	228.264	1.421	3.711	160.656
2013	161.952	1.122	3.828	144.376	83.920	0.824	3.315	101.793
2014	176.795	1.573	2.193	112.388	167.746	1.509	2.180	111.181
2015	148.895	1.012	2.169	147.145	139.509	0.837	1.514	166.702
2016	254.311	1.048	1.283	242.667	249.209	0.941	1.160	264.837
2017	164.281	1.089	3.519	150.868	153.577	1.066	3.447	144.028
2018	254.588	1.099	1.287	231.588	99.802	0.732	1.278	136.389
2019	299.989	2.092	4.915	143.406	296.459	1.807	4.181	164.030
SADDLEBACK								
2010	137.236	0.962	0.433	142.663	96.192	0.778	0.373	123.677
2011	75.942	0.547	0.818	138.842	74.783	0.527	0.753	141.934
2012	83.013	0.728	0.766	113.998	81.379	0.715	0.765	113.864
2013	70.688	0.532	0.513	132.957	70.688	0.532	0.513	132.957
2014	99.074	0.745	0.556	133.025	92.899	0.708	0.549	131.230
2015	46.026	0.385	0.379	119.543	45.654	0.384	0.379	118.976
2016	65.991	0.646	0.780	102.225	62.466	0.602	0.739	103.695
2017	65.349	0.576	0.695	113.479	48.740	0.482	0.545	101.179
2018	45.805	0.377	0.413	121.548	35.830	0.316	0.364	113.487
2019	134.866	0.669	0.388	201.606	42.994	0.512	0.334	83.924
SANTA ANA								
2010	104.571	0.810	1.012	129.134	69.073	0.610	0.837	113.185
2011	102.008	0.816	1.104	125.033	93.837	0.778	1.068	120.566
2012	78.602	0.554	1.115	141.767	78.305	0.553	1.065	141.491
2013	93.345	0.742	1.019	125.854	93.345	0.742	1.019	125.854
2014	91.651	0.843	1.274	108.710	79.414	0.755	1.179	105.222
2015	67.457	0.706	1.130	95.596	66.452	0.703	1.109	94.562
2016	97.266	0.995	1.184	97.732	88.311	0.938	1.112	94.132
2017	81.900	0.712	1.269	115.087	67.193	0.609	1.118	110.346
2018	122.093	0.819	1.304	149.091	56.912	0.550	1.093	103.419
2019	62.785	0.564	0.864	111.359	58.439	0.509	0.821	114.857
SANTA BARBARA								
2010	151.187	1.008	2.228	149.999	138.640	0.888	1.887	156.212
2011	104.820	0.866	1.727	121.045	94.368	0.811	1.635	116.427
2012	153.813	1.148	1.673	133.954	149.352	1.127	1.456	132.567
2013	82.001	0.699	1.219	117.302	82.001	0.699	1.219	117.302
2014	181.231	1.335	2.549	135.717	145.165	1.141	2.012	127.238
2015	152.372	1.517	1.577	100.417	143.291	1.338	1.459	107.103
2016	156.665	1.411	1.464	111.029	130.007	1.269	1.249	102.442
2017	408.433	9.213	13.591	44.334	152.424	1.619	1.206	94.173
2018	172.898	1.022	1.201	169.205	85.566	0.908	1.000	94.285
2019	201.251	1.502	1.750	134.004	179.194	1.389	1.562	129.024
SANTA MONICA								
2010	98.323	0.894	1.124	109.948	73.036	0.689	1.054	105.987
2011	95.085	0.583	1.476	162.996	83.791	0.537	1.177	155.914
2012	101.687	0.792	0.911	128.436	98.428	0.769	0.890	127.913
2013	122.783	1.003	0.959	122.447	122.783	1.003	0.959	122.447
2014	110.742	0.992	0.852	111.609	106.656	0.943	0.772	113.131
2015	75.407	0.625	1.069	120.681	64.417	0.577	1.065	111.607
2016	91.084	0.948	1.210	96.130	89.110	0.933	1.131	95.493
2017	71.892	0.712	1.168	101.023	66.138	0.678	1.108	97.491
2018	80.242	1.045	1.352	76.789	60.403	0.716	1.320	84.334
2019	104.743	0.896	1.424	116.873	100.349	0.861	1.373	116.489

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
SHAVER LAKE								
2010	5700.992	12.891	7.874	442.244	683.925	6.344	3.818	107.812
2011	1667.047	4.222	3.933	394.852	984.340	1.650	2.741	596.466
2012	1184.253	4.523	2.608	261.831	842.662	4.182	1.681	201.512
2013	176.510	3.080	4.987	57.308	176.510	3.080	4.711	57.308
2014	920.254	1.342	4.901	685.961	438.216	0.581	3.960	754.138
2015	422.768	3.415	9.298	123.785	422.768	3.415	9.298	123.785
2016	1062.011	4.993	4.157	212.703	773.999	2.795	2.165	276.874
2017	4273.522	7.947	5.220	537.732	676.224	6.039	5.197	111.971
2018	203.429	2.484	6.362	81.887	203.429	2.484	6.362	81.887
2019	1559.973	5.579	7.850	279.614	1504.825	5.206	5.339	289.066
SOUTH BAY								
2010	190.924	1.206	1.836	158.299	136.407	0.938	1.533	145.392
2011	178.724	1.347	1.481	132.690	141.550	1.207	1.169	117.293
2012	122.682	1.174	1.713	104.516	120.710	1.153	1.630	104.694
2013	142.153	1.490	1.448	95.391	142.153	1.490	1.448	95.391
2014	125.154	1.390	1.650	90.009	110.254	1.281	1.502	86.094
2015	164.072	1.305	1.660	125.704	160.399	1.272	1.613	126.136
2016	183.899	1.884	2.020	97.600	150.901	1.752	1.818	86.124
2017	99.194	0.931	1.460	106.532	87.355	0.818	1.328	106.765
2018	90.626	1.090	1.771	83.134	82.272	1.007	1.524	81.666
2019	79.308	1.010	1.398	78.544	71.491	0.950	1.313	75.271
TEHACHAPI								
2010	434.015	3.232	6.291	134.268	220.369	2.573	4.677	85.639
2011	231.229	1.814	3.190	127.454	177.911	1.694	2.582	105.026
2012	117.963	1.434	1.495	82.262	117.963	1.434	1.495	82.262
2013	232.672	1.121	1.661	207.634	232.333	1.102	1.638	210.815
2014	130.704	1.290	2.090	101.348	83.519	1.097	1.783	76.126
2015	298.959	1.215	3.960	246.114	236.807	1.037	2.513	228.329
2016	97.292	1.132	2.363	85.982	76.426	1.036	1.940	73.781
2017	86.514	1.048	3.126	82.573	77.927	0.890	2.946	87.574
2018	55.989	0.673	2.276	83.199	54.960	0.655	2.146	83.856
2019	2983.876	4.608	2.171	647.599	467.572	2.716	1.776	172.135
THOUSAND OAKS								
2010	124.263	1.366	1.567	91.002	92.331	0.815	1.435	113.243
2011	146.687	1.145	1.928	128.129	121.175	1.008	1.732	120.168
2012	127.732	1.049	1.196	121.739	118.833	0.991	1.161	119.968
2013	93.860	0.914	1.164	102.735	93.846	0.913	1.154	102.755
2014	104.172	1.102	1.426	94.537	95.331	1.013	1.287	94.150
2015	106.589	0.919	1.893	115.938	103.685	0.889	1.845	116.643
2016	143.775	1.307	2.585	110.021	128.242	1.227	2.378	104.484
2017	151.735	1.427	3.270	106.304	106.392	1.063	2.903	100.056
2018	1167.537	1.480	1.634	788.966	109.945	0.967	1.354	113.663
2019	517.053	1.723	1.213	300.090	112.978	1.182	1.163	95.561
TULARE								
2010	126.684	1.043	1.642	121.481	98.341	0.932	1.503	105.567
2011	83.994	0.743	1.387	113.010	75.838	0.712	1.301	106.565
2012	135.897	1.044	1.455	130.115	123.112	1.005	1.290	122.504
2013	244.439	1.448	1.698	168.757	71.744	0.800	1.548	89.668
2014	137.738	1.164	1.519	118.285	93.658	0.997	1.303	93.949
2015	127.502	1.052	1.414	121.240	99.829	0.908	1.106	109.936
2016	108.444	1.091	1.105	99.370	101.822	1.040	1.082	97.895
2017	191.659	1.343	1.198	142.710	105.718	1.282	1.188	82.463
2018	56.234	0.685	1.077	82.150	51.292	0.652	1.017	78.639
2019	72.671	0.745	1.075	97.509	69.696	0.716	1.035	97.356
VALENCIA								
2010	117.815	0.806	2.195	146.239	103.447	0.698	2.114	148.275
2011	130.855	1.036	1.412	126.276	119.058	0.986	1.379	120.768
2012	62.009	0.462	1.134	134.286	61.595	0.461	1.133	133.738
2013	50.940	0.532	0.683	95.801	50.940	0.532	0.683	95.801
2014	79.216	0.605	0.998	130.876	63.729	0.533	0.935	119.499
2015	72.274	0.611	0.971	118.224	71.053	0.604	0.845	117.624
2016	105.087	0.968	1.549	108.594	97.405	0.846	1.522	115.187
2017	136.618	1.079	1.549	126.671	81.267	0.702	1.283	115.765
2018	92.407	1.063	1.451	86.969	79.329	0.945	1.391	83.982
2019	457.466	1.224	0.965	373.656	101.430	0.914	0.918	111.000

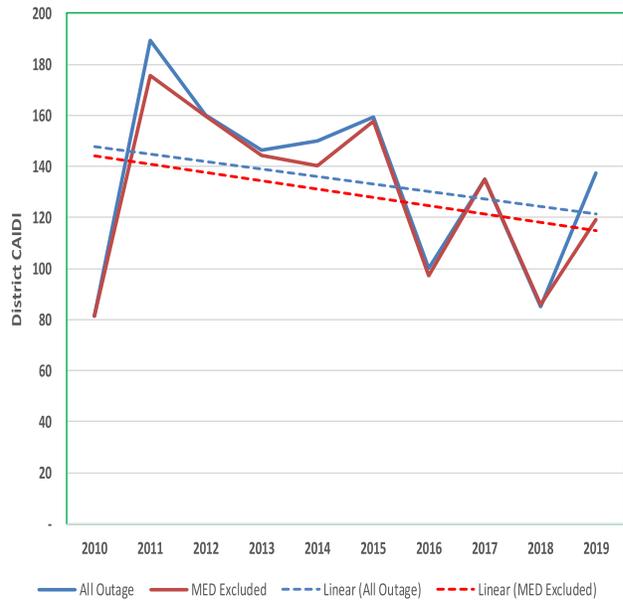
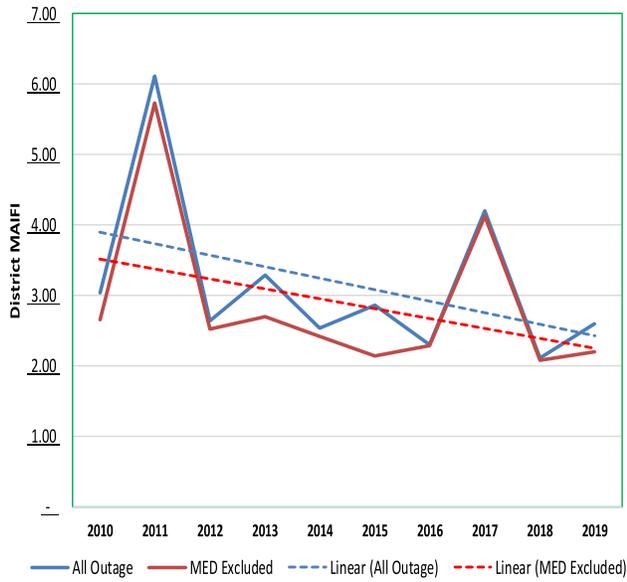
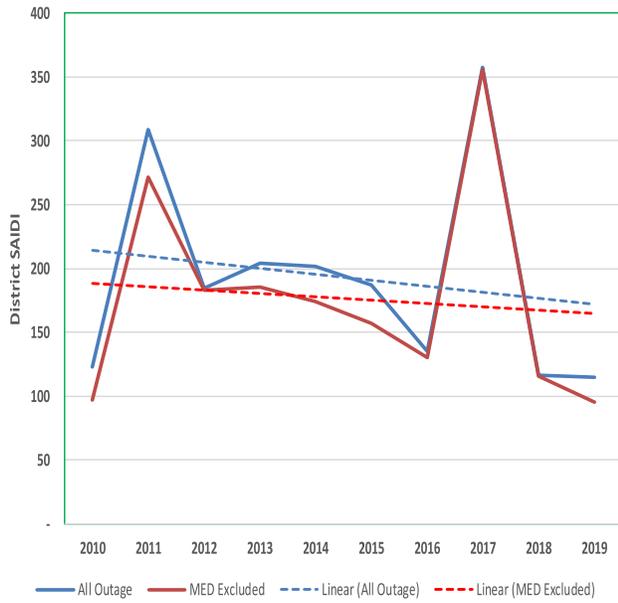
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
VENTURA								
2010	182.739	1.720	2.279	106.240	144.070	1.345	2.103	107.099
2011	167.849	2.247	1.561	74.683	139.680	2.112	1.337	66.150
2012	134.807	1.155	1.507	116.752	128.528	1.140	1.469	112.780
2013	100.521	1.210	1.417	83.104	100.504	1.210	1.417	83.093
2014	183.769	1.648	2.215	111.528	151.635	1.386	2.075	109.381
2015	148.848	1.190	1.447	125.112	141.430	1.149	1.375	123.110
2016	150.408	1.236	1.679	121.649	107.140	1.019	1.553	105.110
2017	520.897	3.122	2.293	166.846	114.758	1.240	1.542	92.559
2018	136.042	1.438	1.921	94.613	100.385	1.177	1.676	85.301
2019	334.957	1.647	2.610	203.369	133.541	1.364	2.407	97.920
VICTORVILLE								
2010	96.446	1.008	2.081	95.727	67.510	0.610	1.368	110.738
2011	196.846	1.008	2.153	195.358	82.406	0.791	1.877	104.144
2012	67.698	0.662	1.775	102.224	57.567	0.584	1.606	98.647
2013	61.333	0.632	1.312	97.109	61.010	0.620	1.179	98.380
2014	68.830	0.633	0.896	108.709	67.680	0.620	0.877	109.146
2015	87.026	0.906	1.839	96.063	72.897	0.812	1.551	89.751
2016	79.352	0.917	1.396	86.493	75.943	0.888	1.327	85.547
2017	84.068	0.895	2.353	93.936	73.124	0.808	1.757	90.485
2018	125.922	0.862	1.345	146.015	97.868	0.802	1.270	122.074
2019	82.422	1.102	2.008	74.767	74.675	0.986	1.667	75.770
WHITTIER								
2010	101.330	0.696	1.127	145.626	74.586	0.572	1.023	130.480
2011	99.736	0.749	1.187	133.093	91.881	0.724	1.122	126.855
2012	72.597	0.742	1.383	97.877	72.304	0.719	1.312	100.597
2013	135.043	0.859	1.055	157.172	135.043	0.859	1.055	157.172
2014	87.600	0.704	1.155	124.399	84.188	0.689	1.090	122.157
2015	114.520	0.733	1.084	156.317	104.851	0.704	0.989	148.883
2016	137.336	0.814	1.416	168.756	90.212	0.616	1.290	146.361
2017	148.909	0.896	1.872	166.103	91.911	0.750	1.655	122.501
2018	87.742	0.666	1.413	131.834	73.659	0.575	1.297	128.006
2019	84.861	0.730	1.379	116.212	73.994	0.624	1.160	118.511
WILDOMAR								
2010	127.124	1.122	1.565	113.258	79.888	0.881	1.172	90.656
2011	109.406	1.219	1.225	89.739	108.810	1.210	1.197	89.923
2012	88.539	0.725	0.805	122.193	87.186	0.690	0.756	126.346
2013	40.512	0.555	0.656	72.932	40.122	0.554	0.656	72.407
2014	118.493	0.806	0.743	147.031	112.300	0.772	0.683	145.548
2015	52.699	0.597	1.255	88.256	48.313	0.566	1.054	85.401
2016	84.010	0.866	0.951	97.031	79.151	0.839	0.861	94.378
2017	90.151	0.800	1.015	112.679	56.373	0.580	0.933	97.161
2018	60.772	0.747	0.846	81.358	51.890	0.622	0.760	83.373
2019	94.466	0.768	0.738	123.007	53.127	0.610	0.726	87.158
YUCCA VALLEY								
2010	307.670	3.017	5.167	101.994	235.893	2.370	4.016	99.547
2011	436.441	2.163	6.922	201.767	354.867	1.966	5.598	180.481
2012	319.821	3.413	7.170	93.708	250.377	2.806	5.467	89.239
2013	216.972	1.500	4.983	144.620	216.966	1.500	4.983	144.626
2014	304.182	1.490	4.856	204.146	293.662	1.407	4.851	208.750
2015	389.085	1.804	3.922	215.688	260.176	1.189	2.708	218.766
2016	463.683	3.393	3.875	136.661	440.057	3.257	3.106	135.131
2017	300.331	1.957	1.602	153.472	270.109	1.728	1.509	156.277
2018	353.832	1.937	2.747	182.664	206.580	1.488	1.832	138.842
2019	451.746	2.341	1.930	192.934	401.604	2.067	1.728	194.288

- b. The linear charts below show the past 10 years District Reliability Performance from 2010 – 2019 of dSAIDI, dSAIFI, dMAIFI and dCAIDI for all 34 districts. There are separate charts of unplanned outages including and excluding MED. The charts shown are listed in district name in alphabetical order.

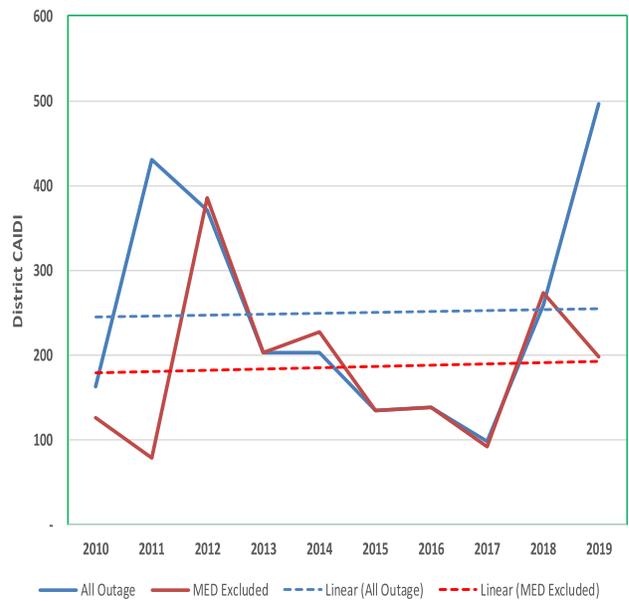
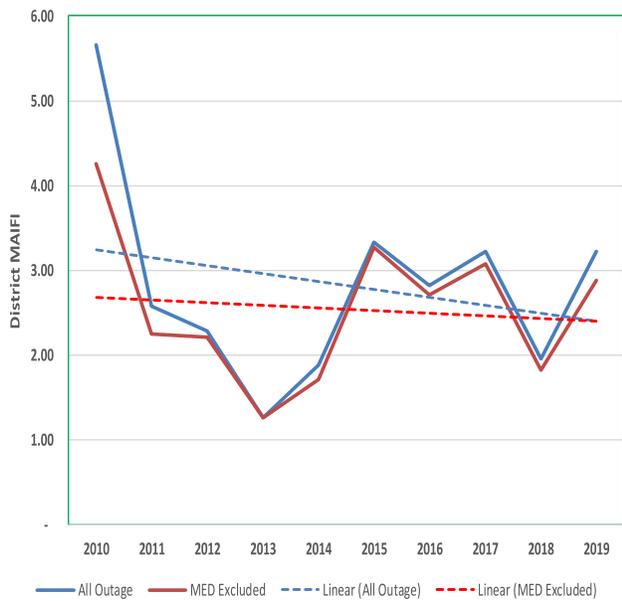
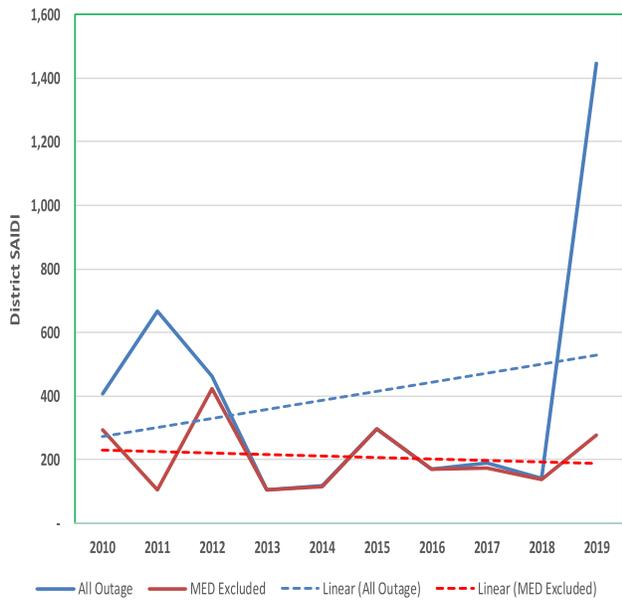
ANTELOPE VALLEY District Reliability Performance



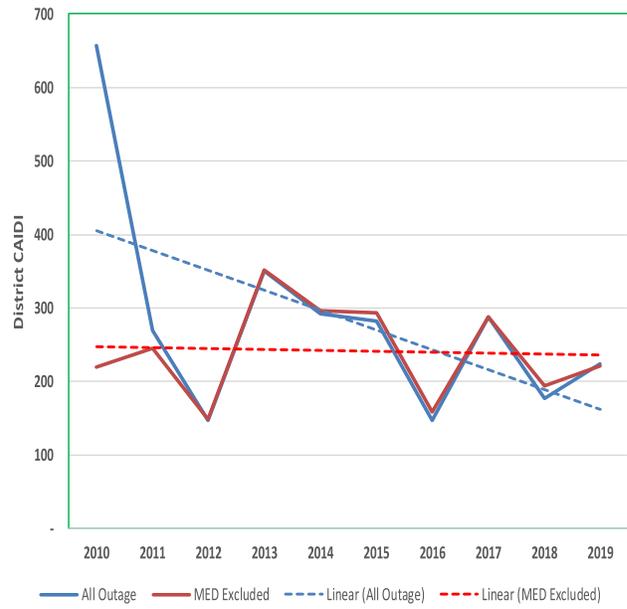
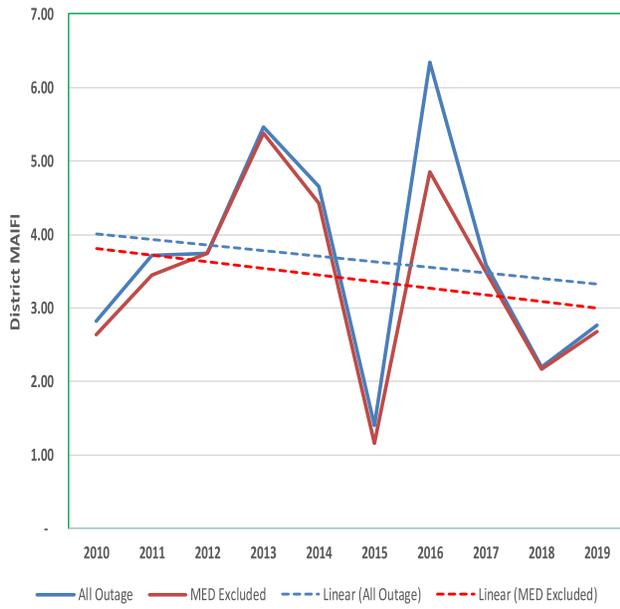
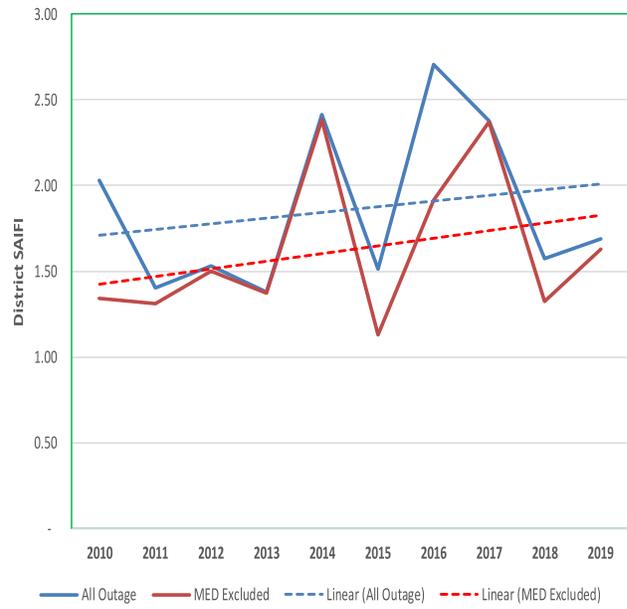
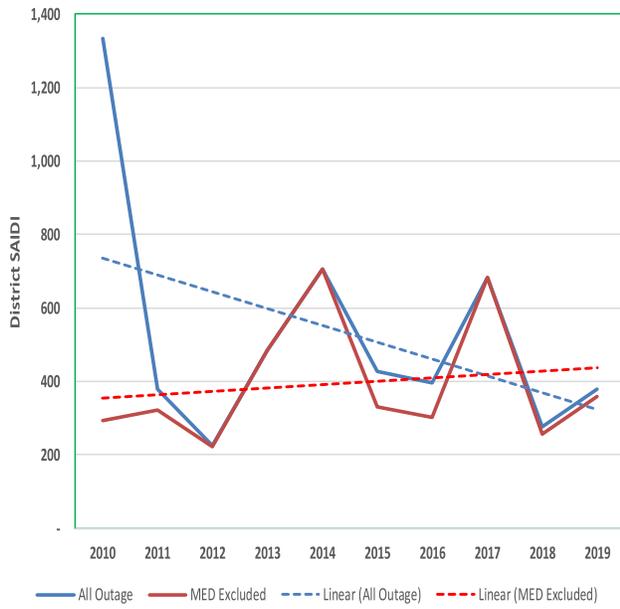
BARSTOW District Reliability Performance



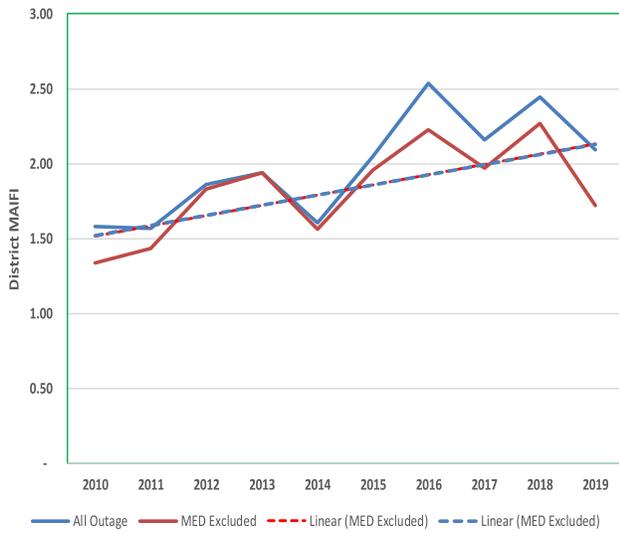
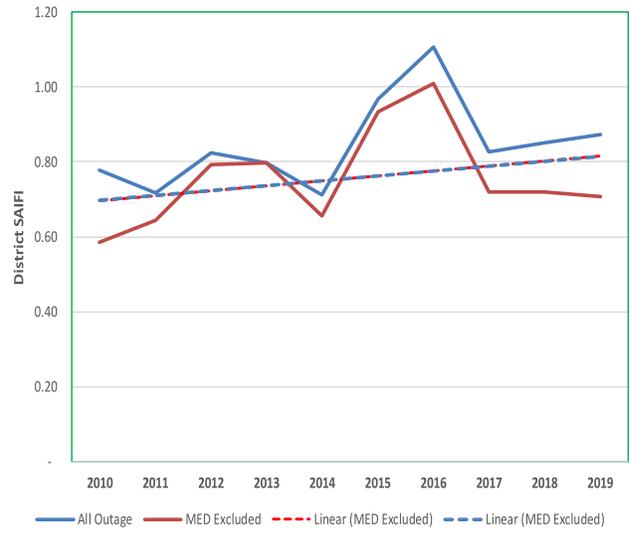
BISHOP District Reliability Performance



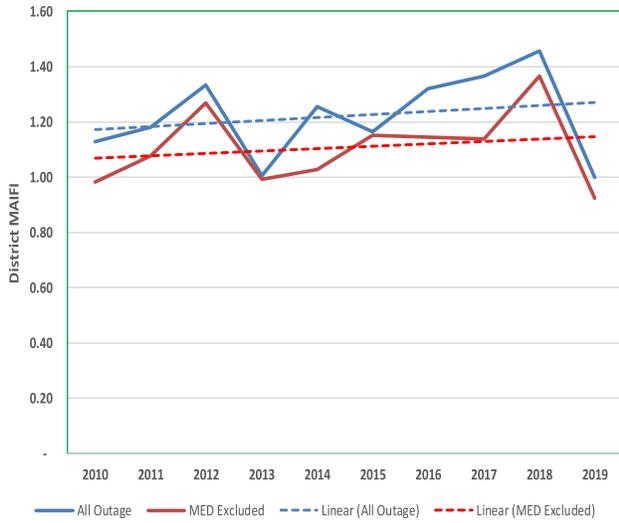
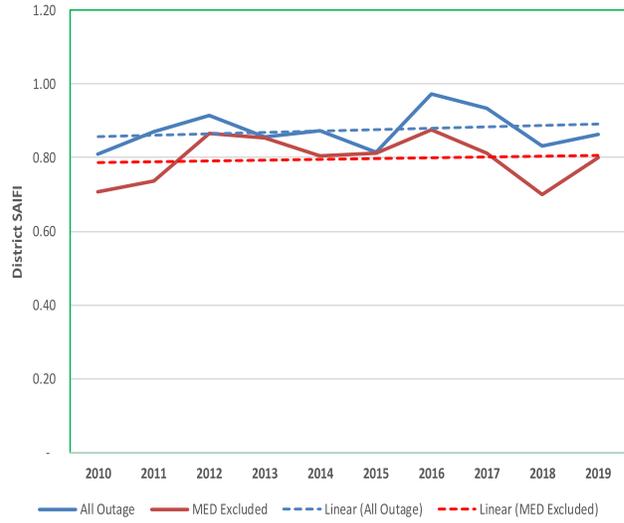
BLYTHE District Reliability Performance



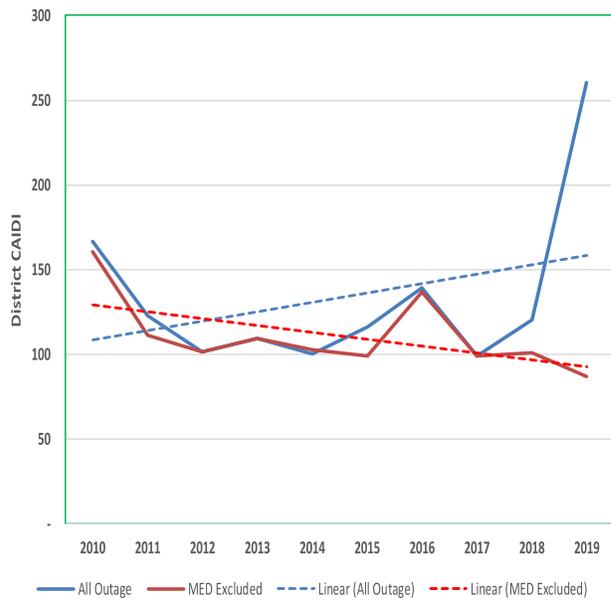
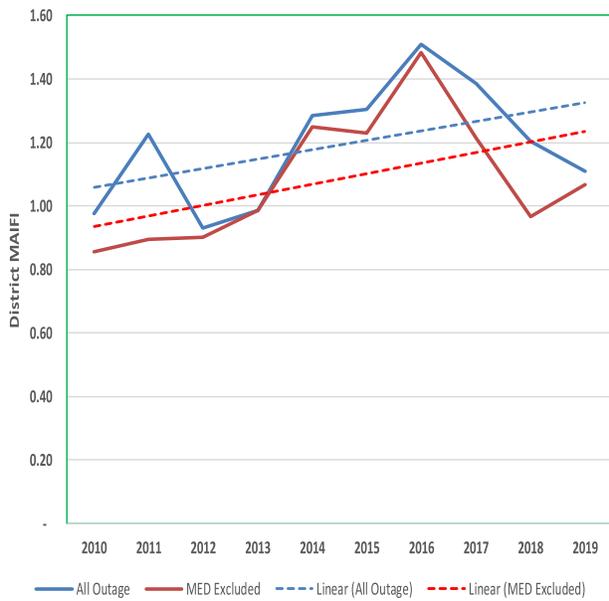
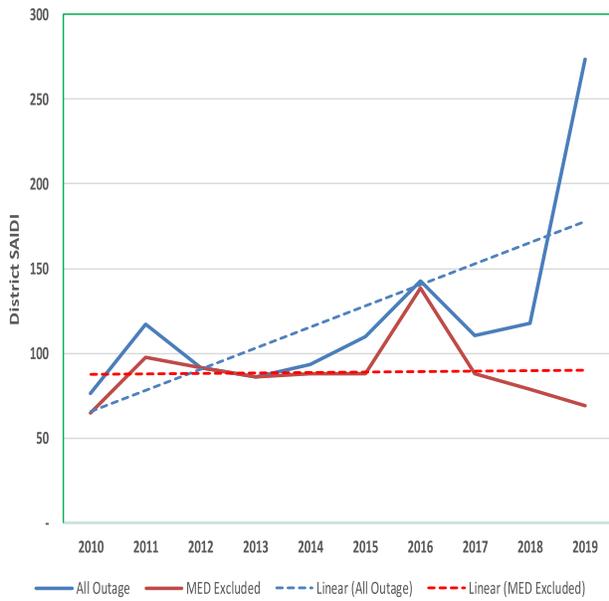
COMPTON District Reliability Performance



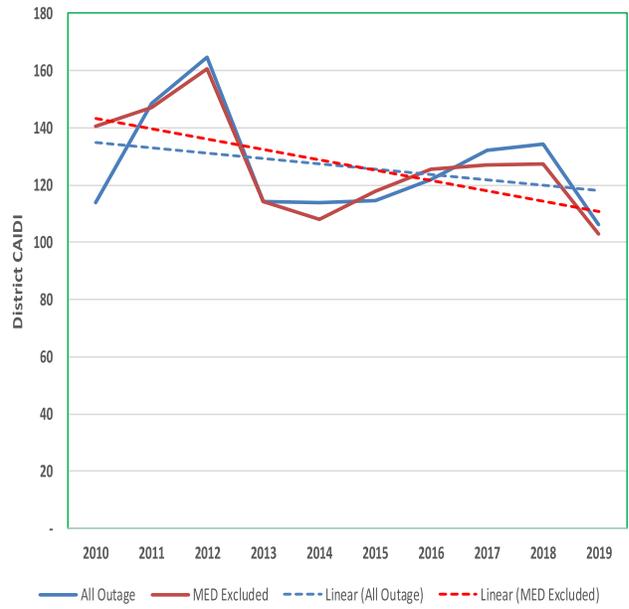
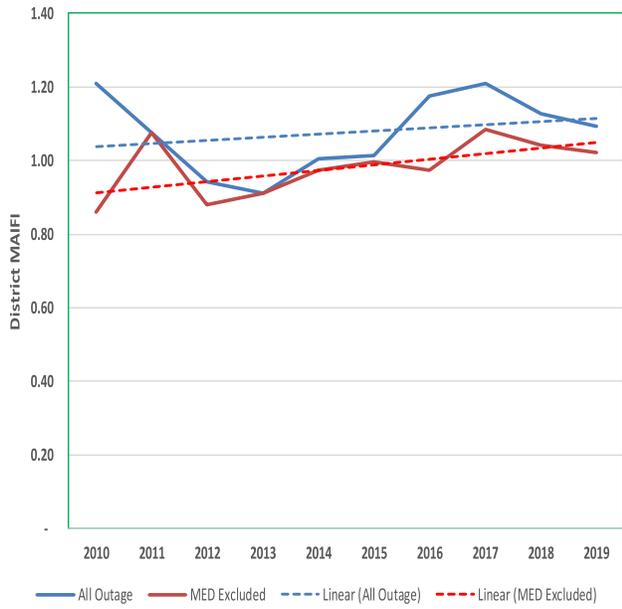
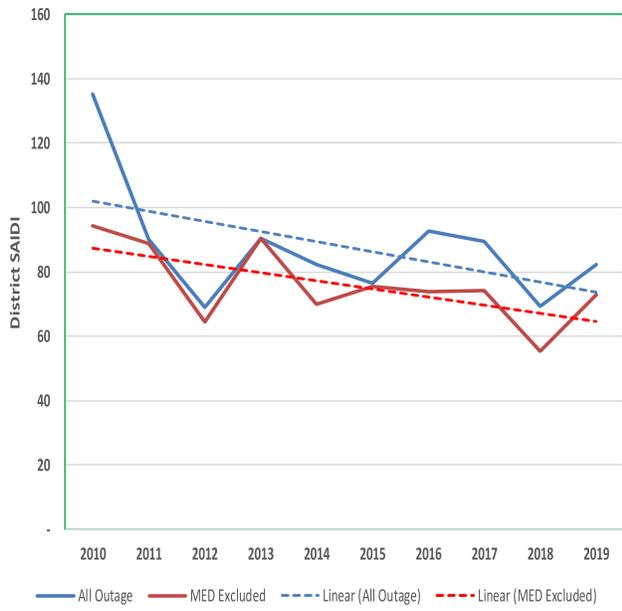
COVINA District Reliability Performance



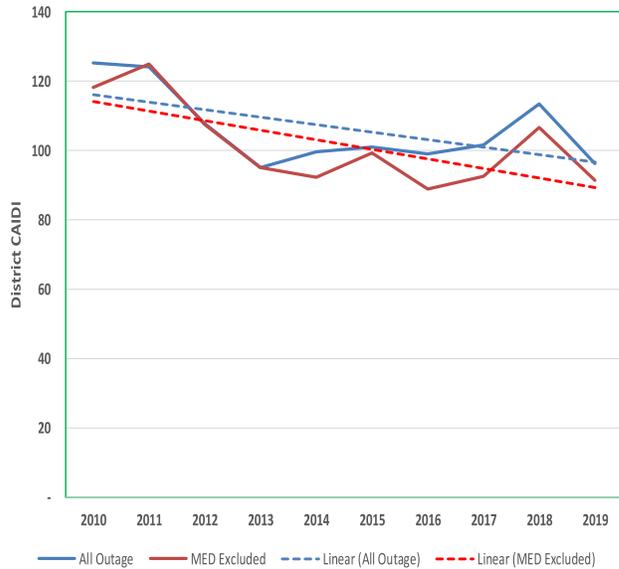
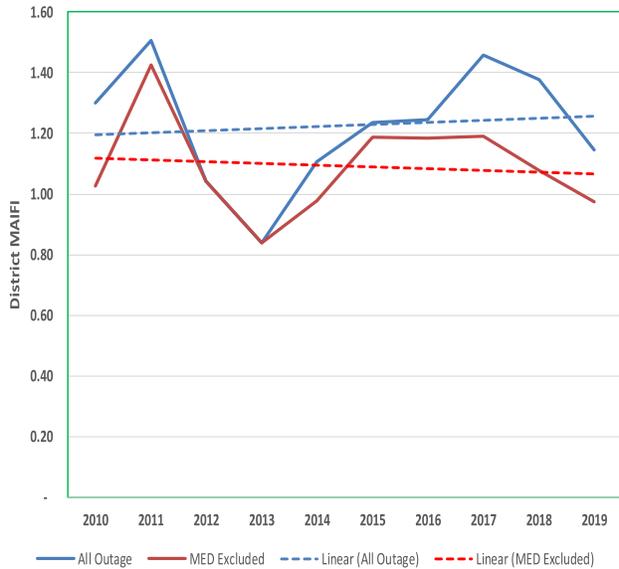
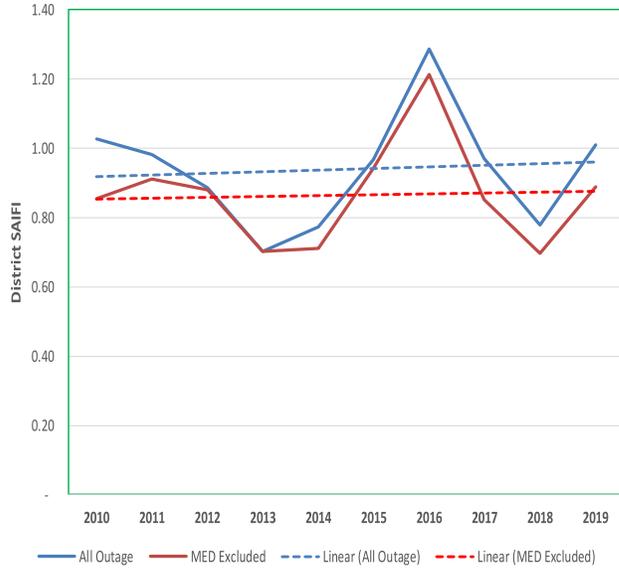
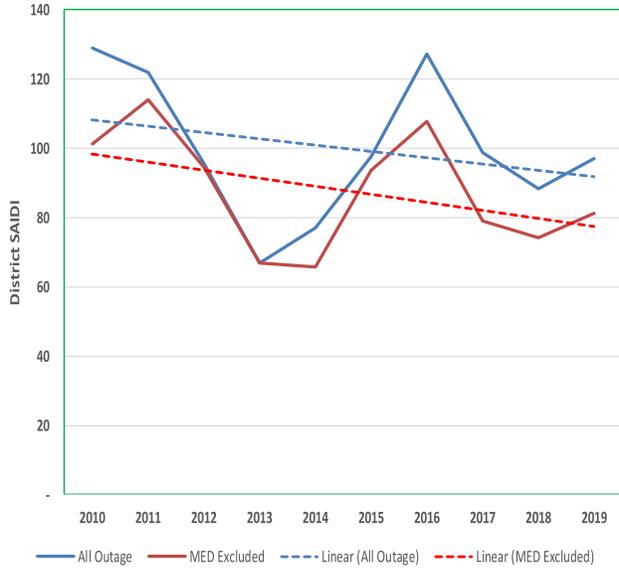
FOOTHILL District Reliability Performance



FULLERTON District Reliability Performance

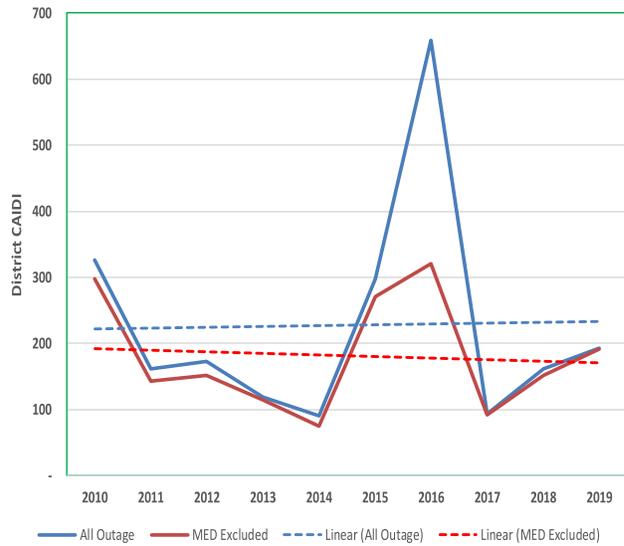
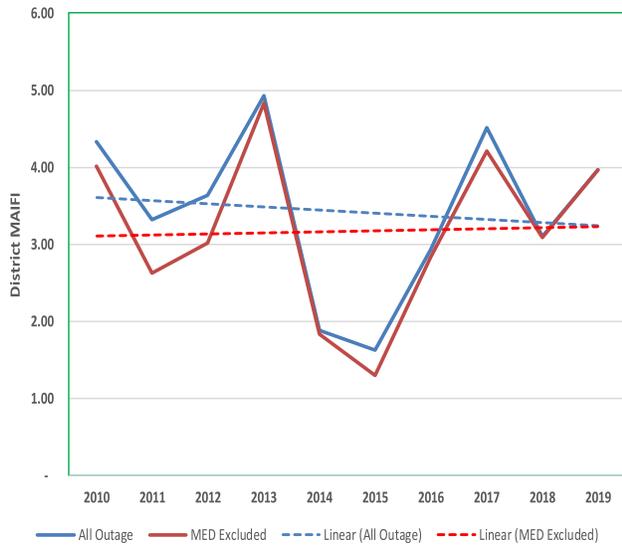
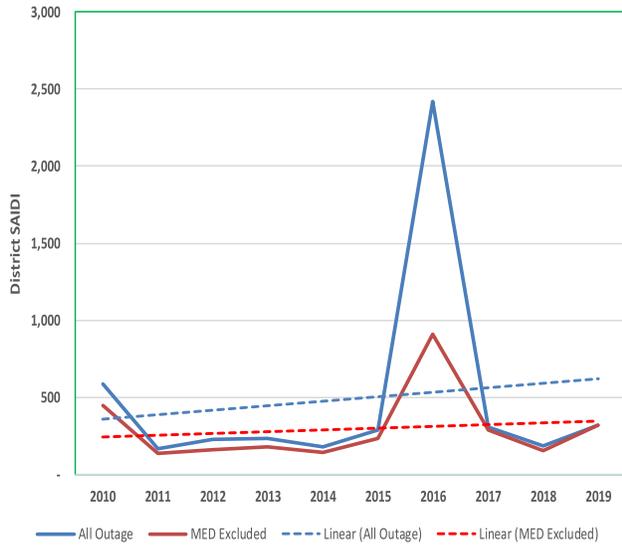


HUNTINGTON BEACH District Reliability Performance ⁸

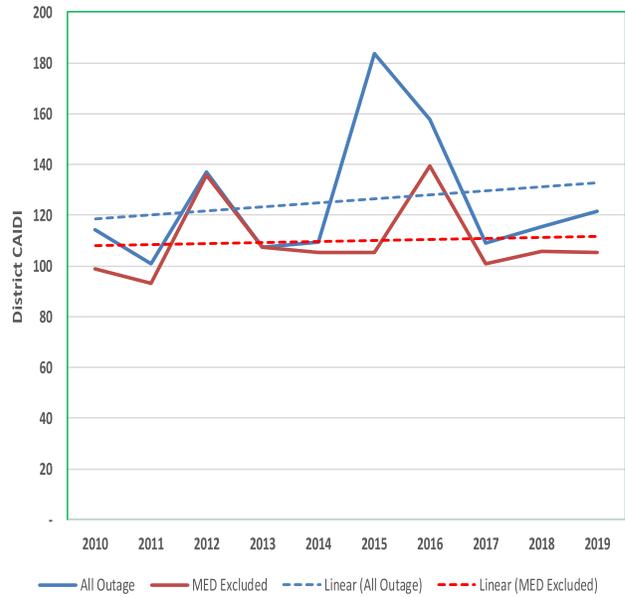
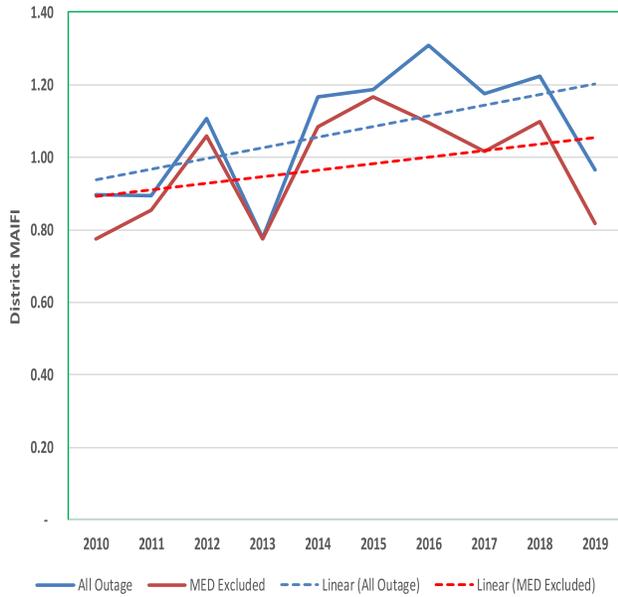
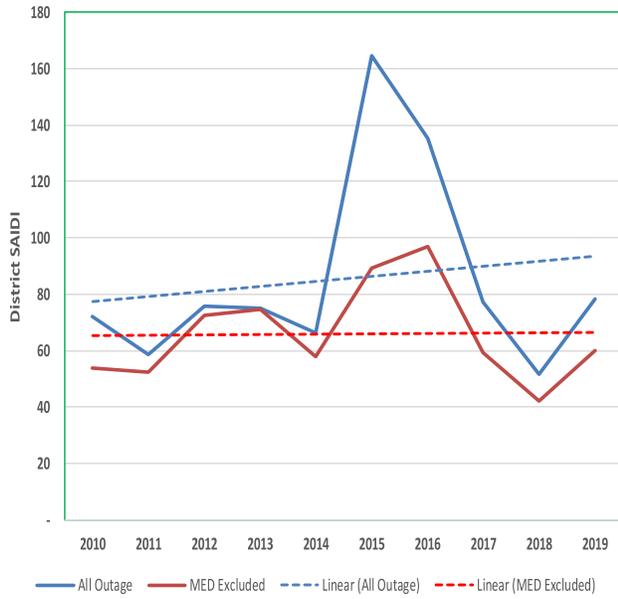


⁸ For 2010 - 2019, Catalina District charts have been combined with Huntington Beach District, since the Catalina District operations have been combined with the Huntington Beach District.

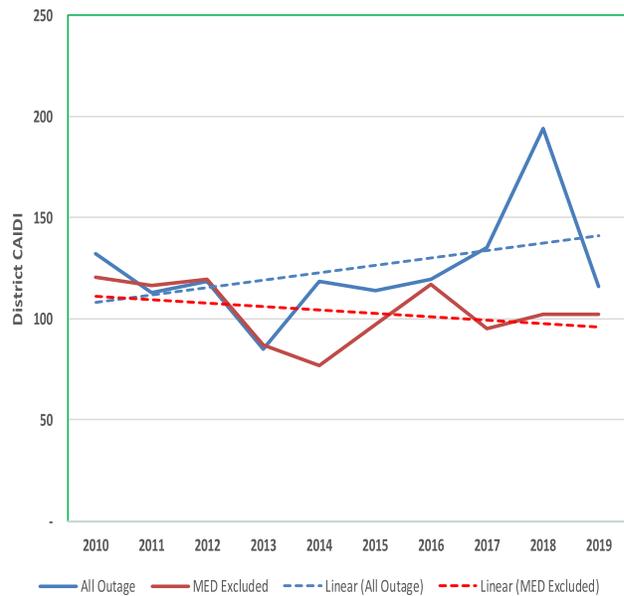
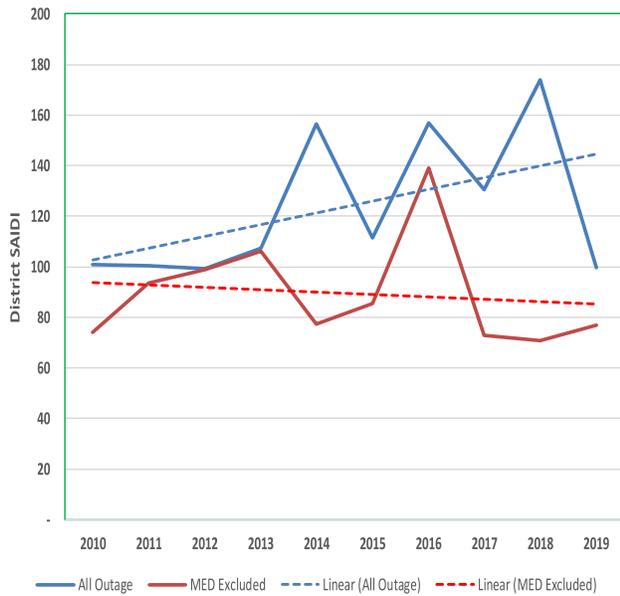
KERNVILLE District Reliability Performance



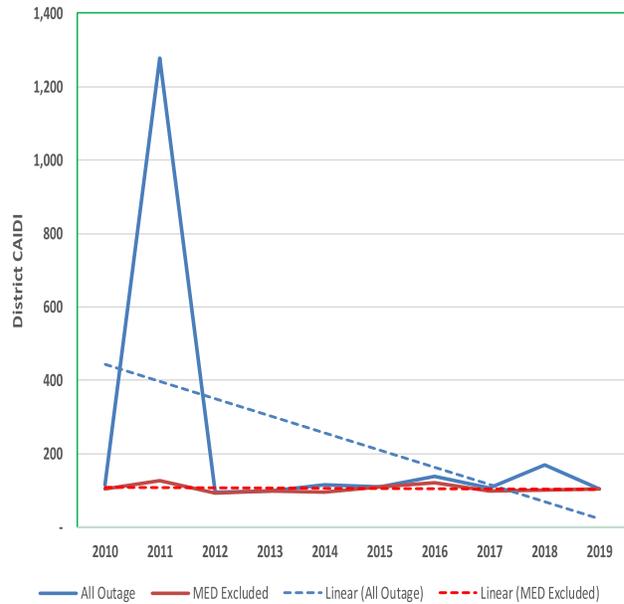
LONG BEACH District Reliability Performance



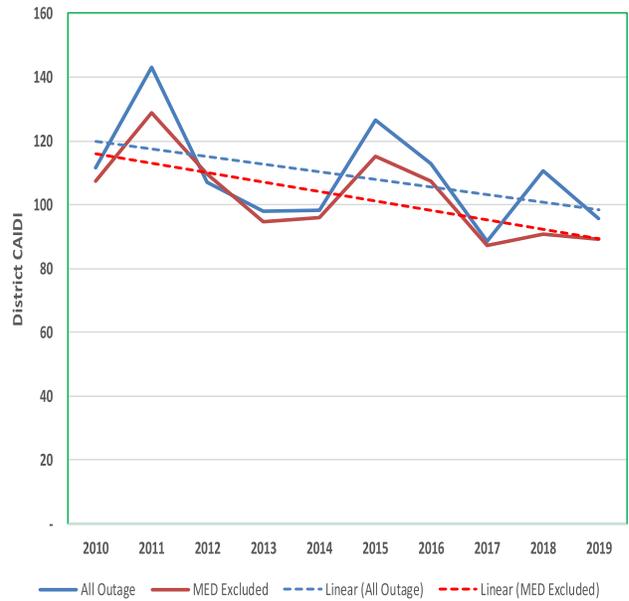
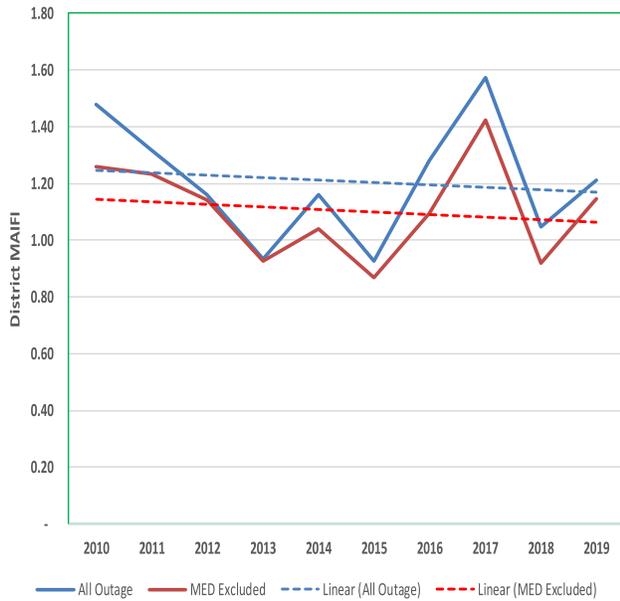
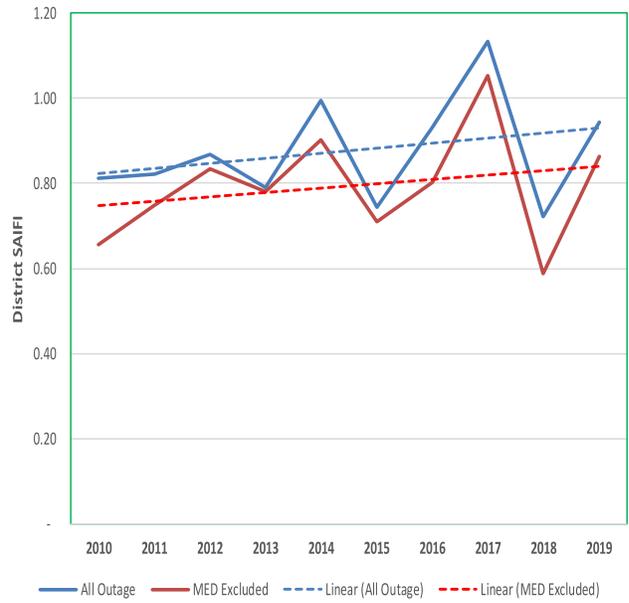
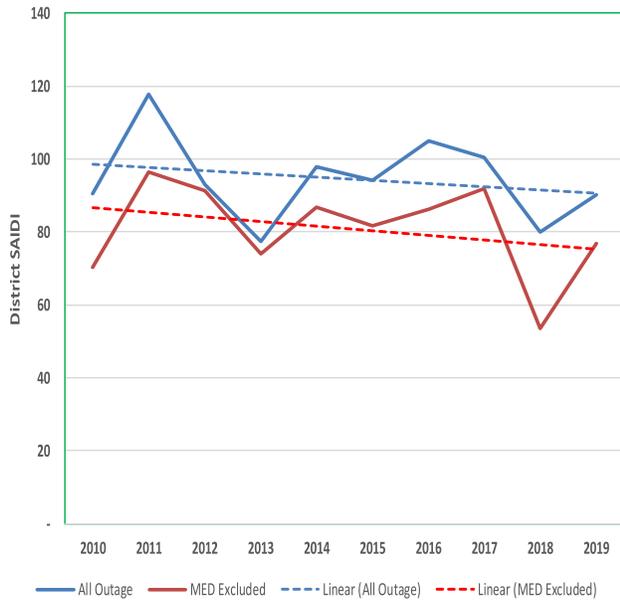
MENIFEE District Reliability Performance



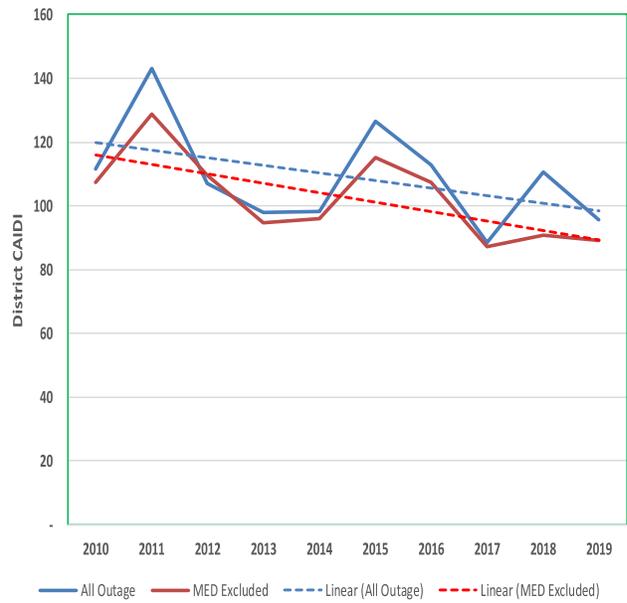
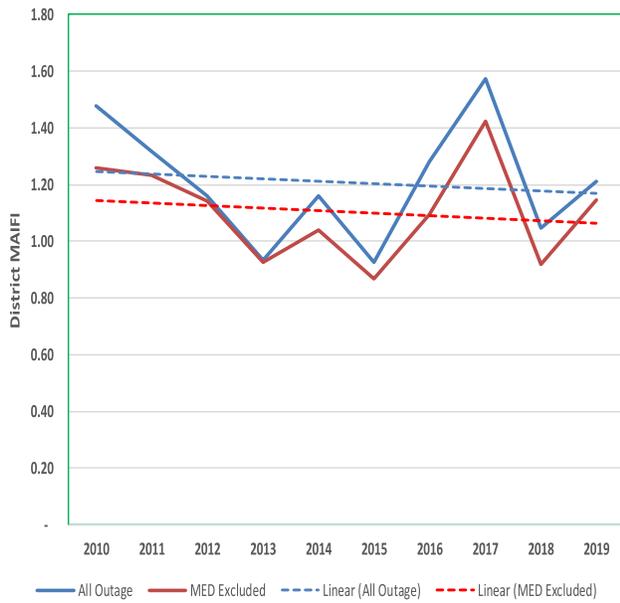
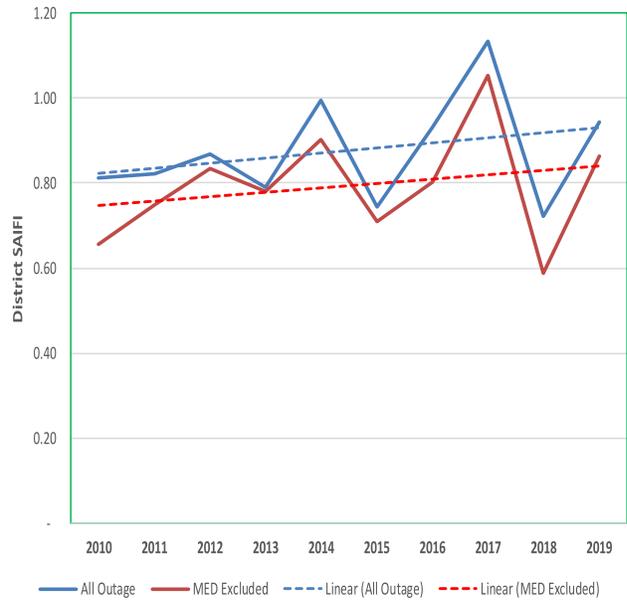
MONROVIA District Reliability Performance



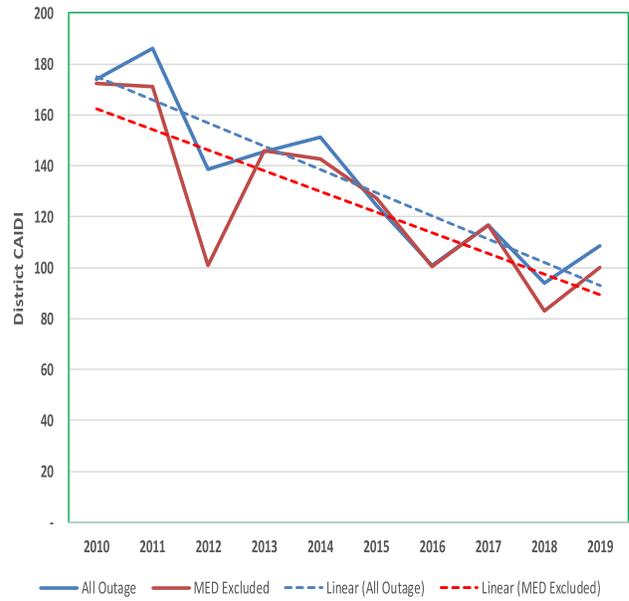
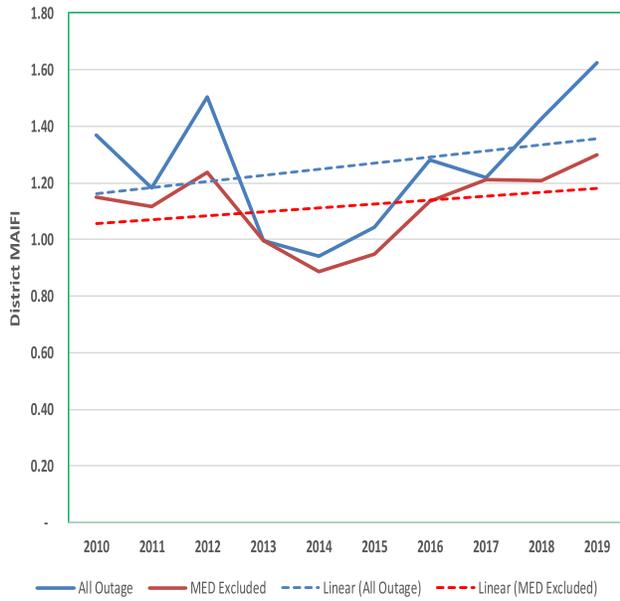
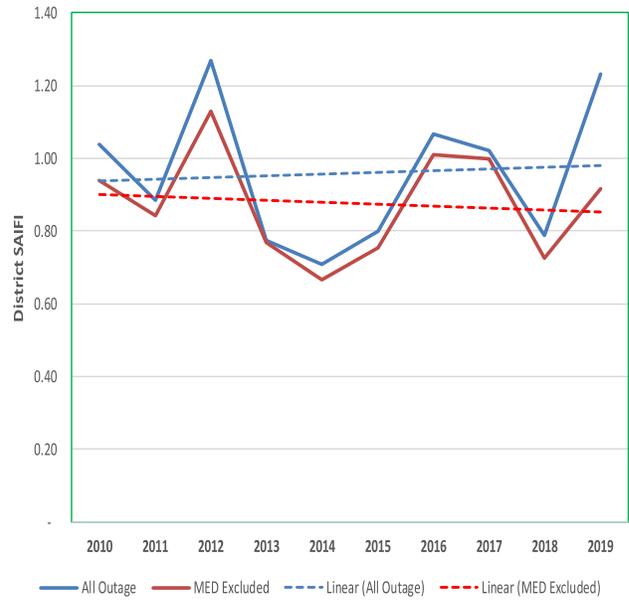
MONTEBELLO District Reliability Performance



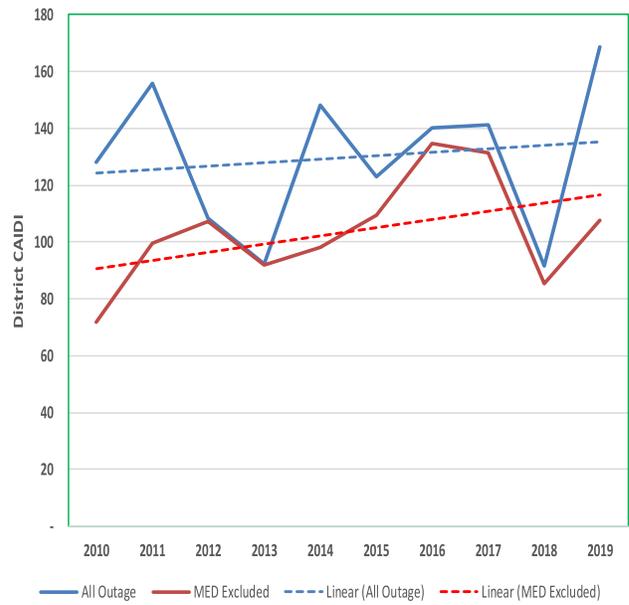
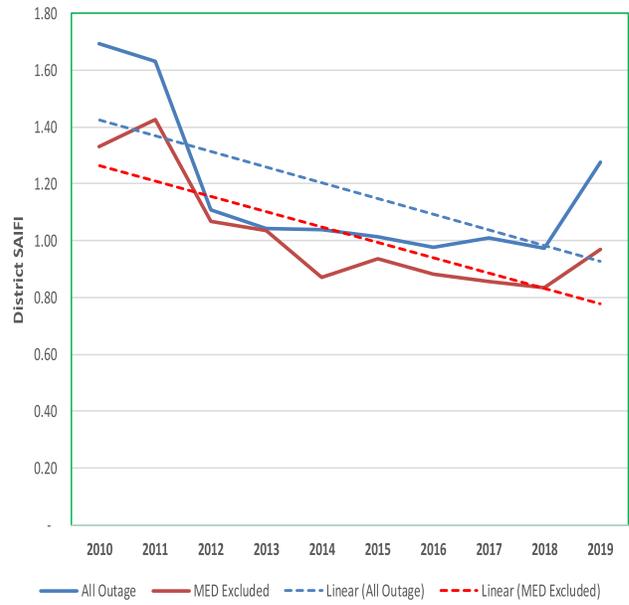
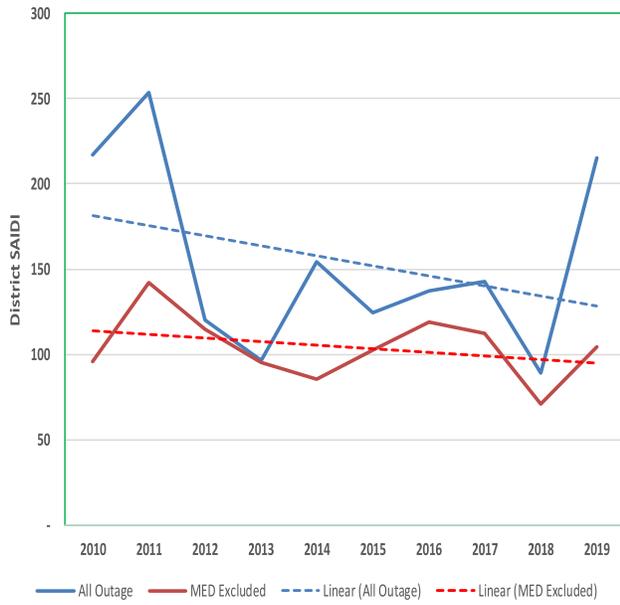
ONTARIO District Reliability Performance



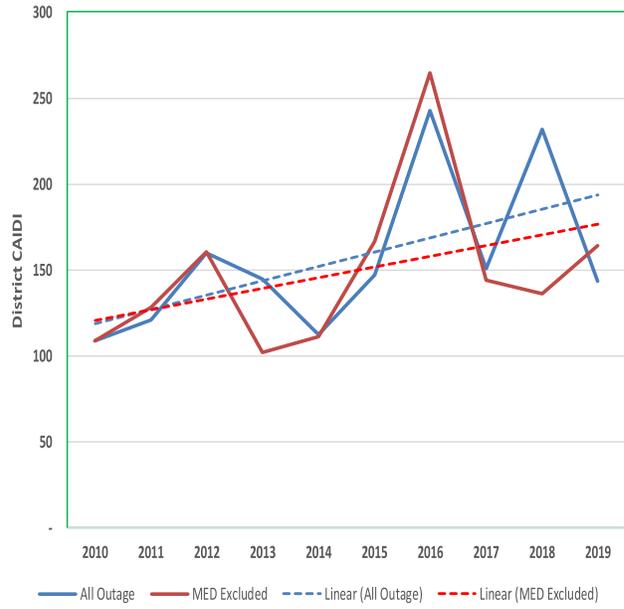
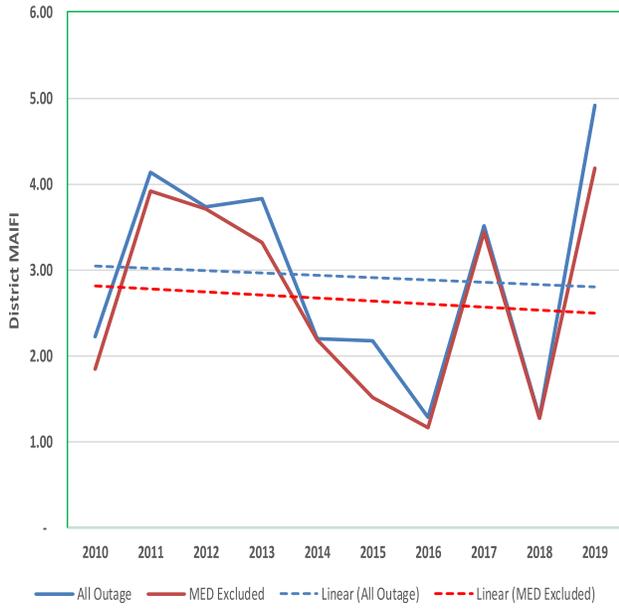
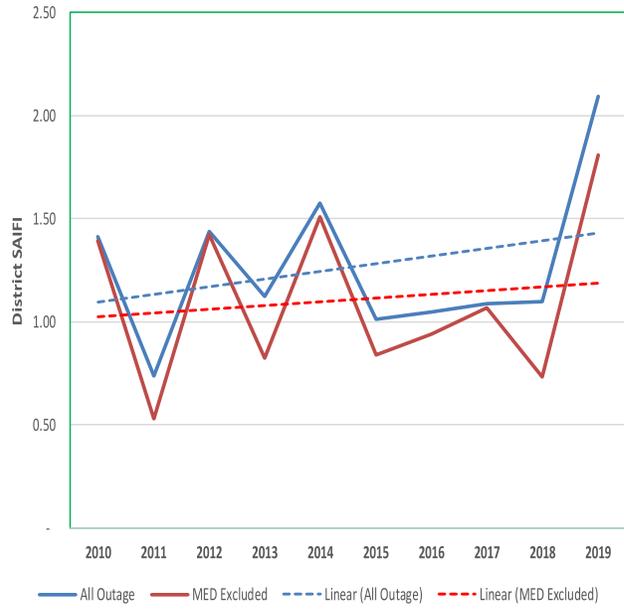
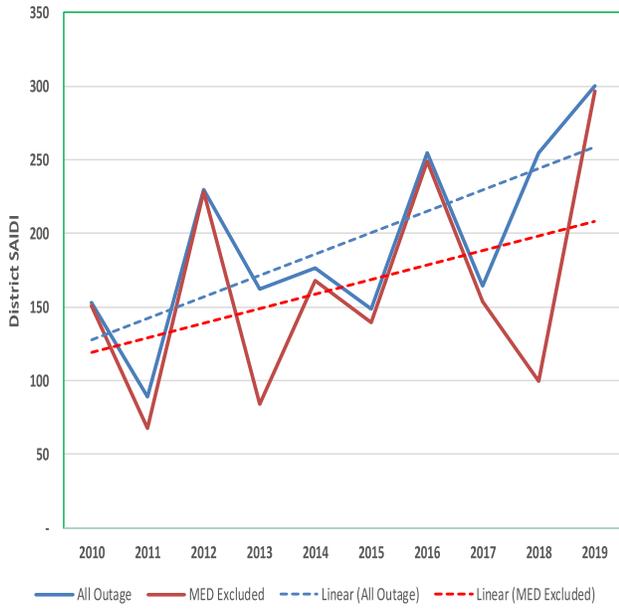
PALM SPRINGS District Reliability Performance



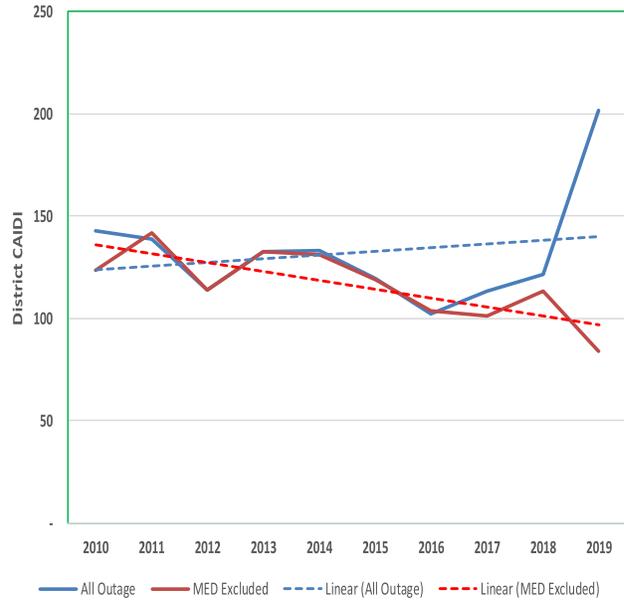
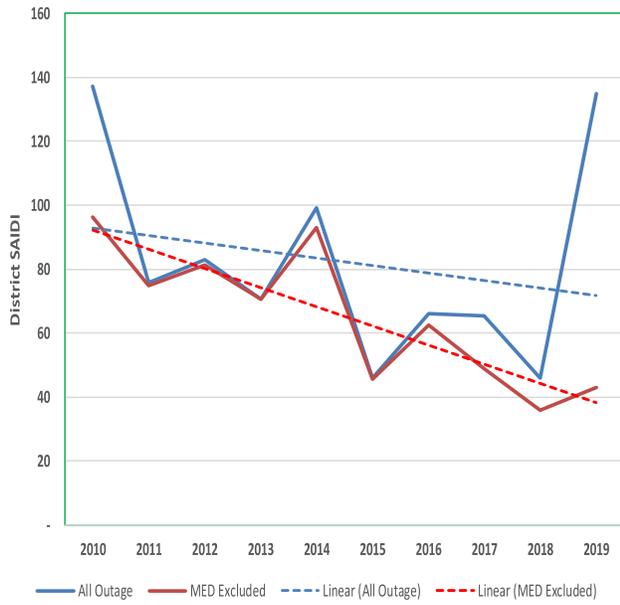
REDLANDS District Reliability Performance



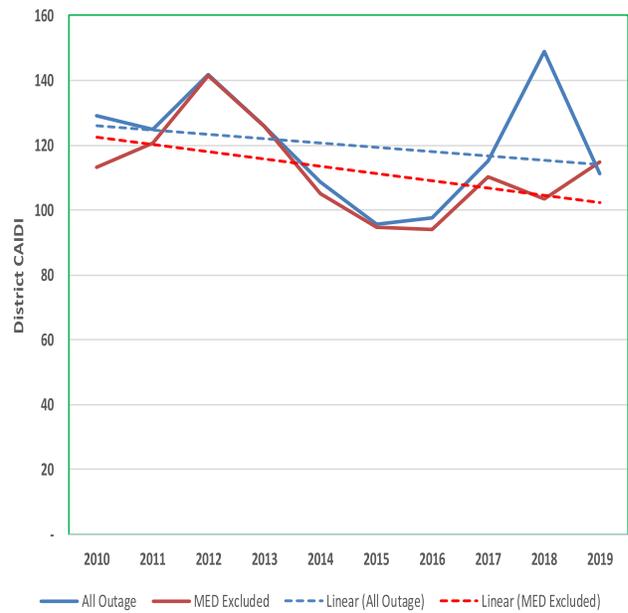
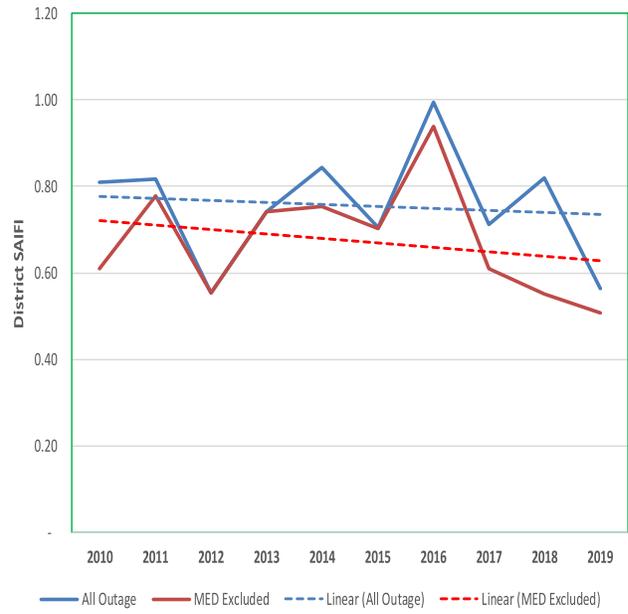
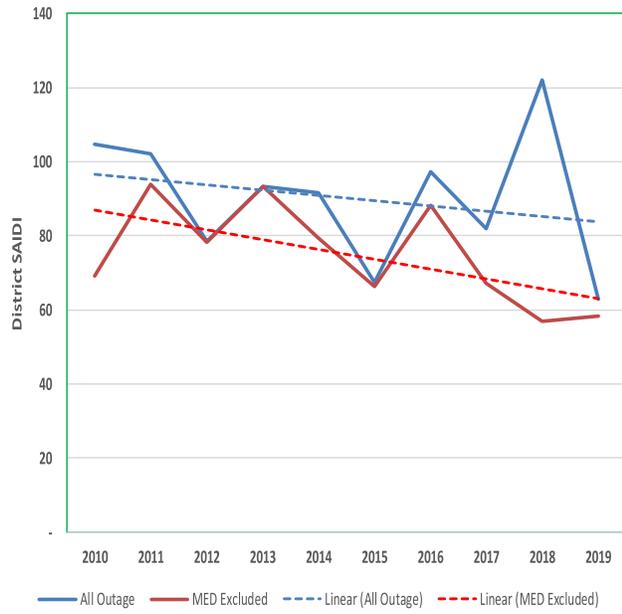
RIDGECREST District Reliability Performance



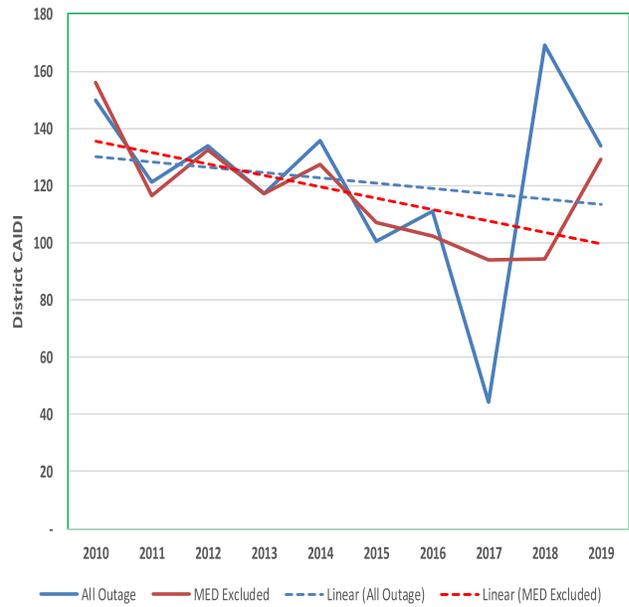
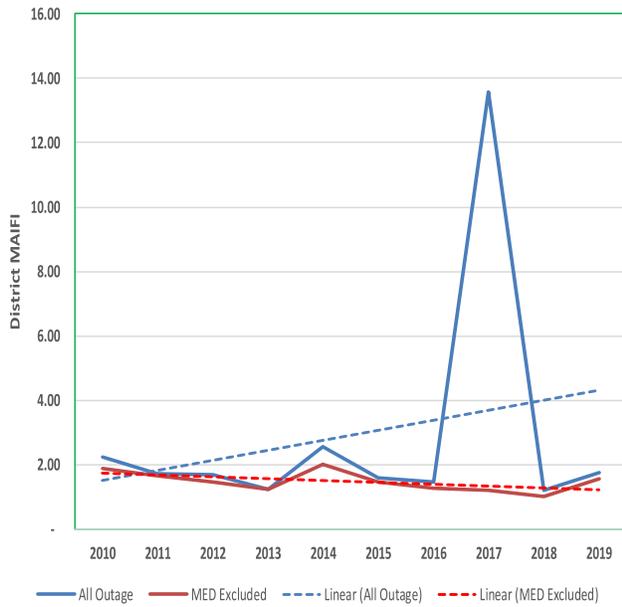
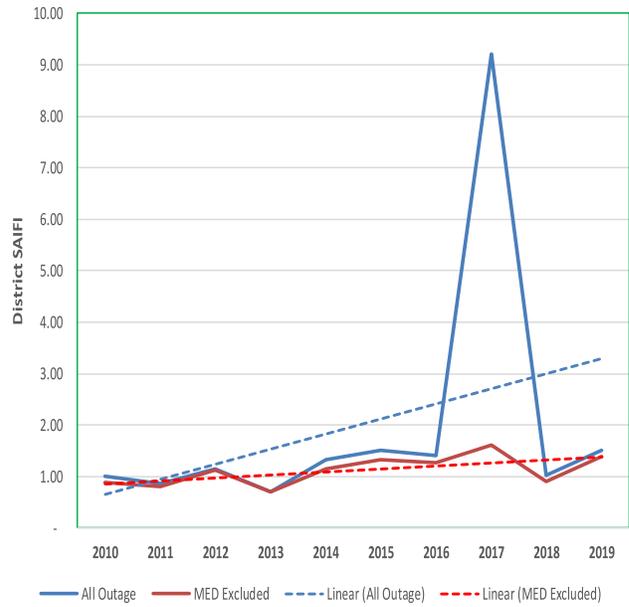
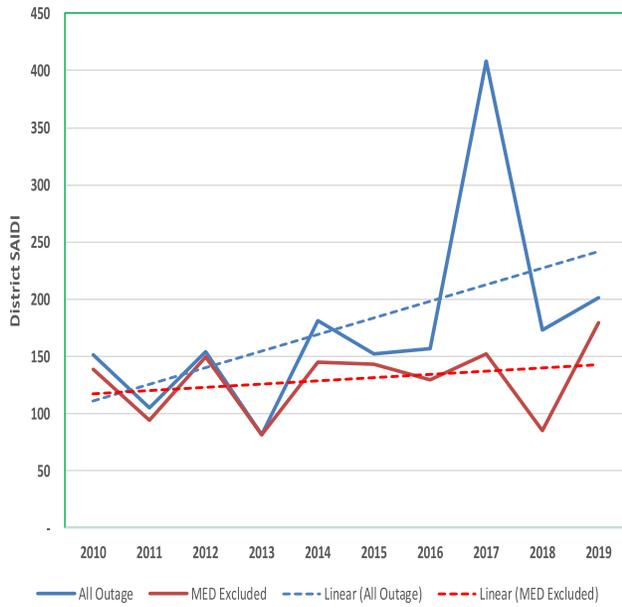
SADDLEBACK District Reliability Performance



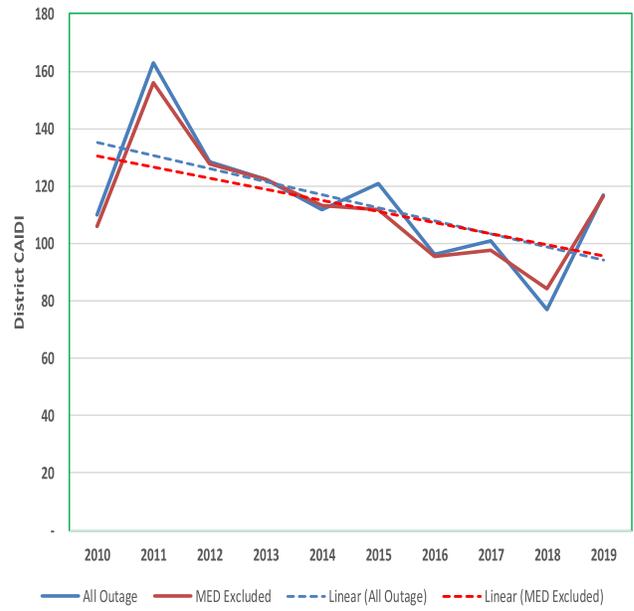
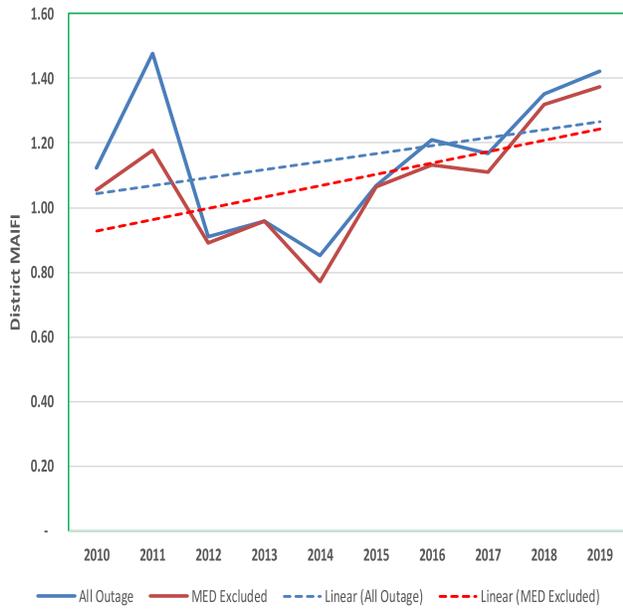
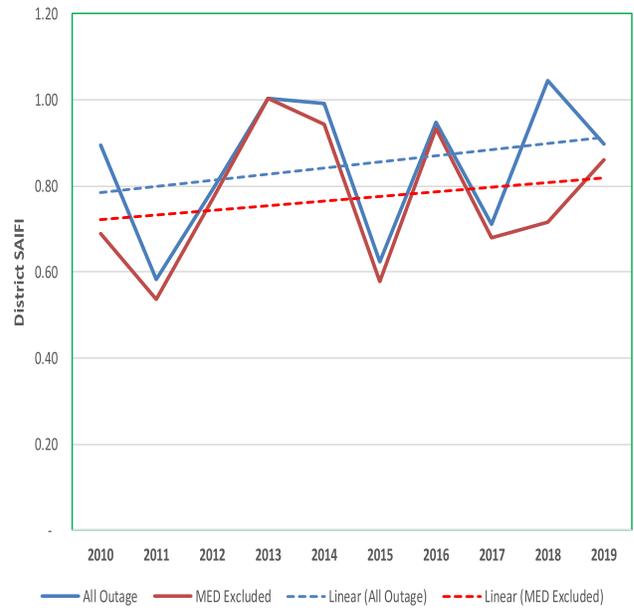
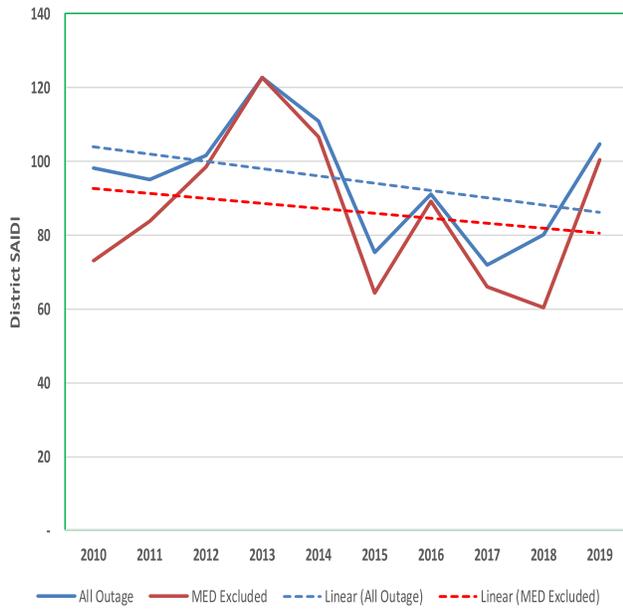
SANTA ANA District Reliability Performance



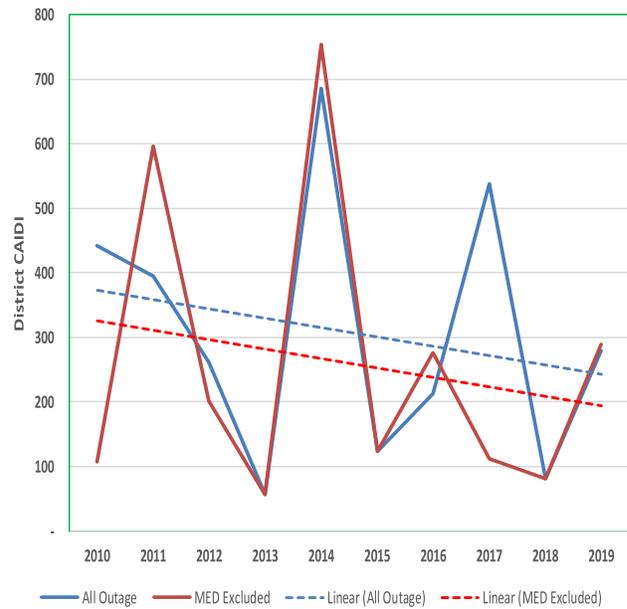
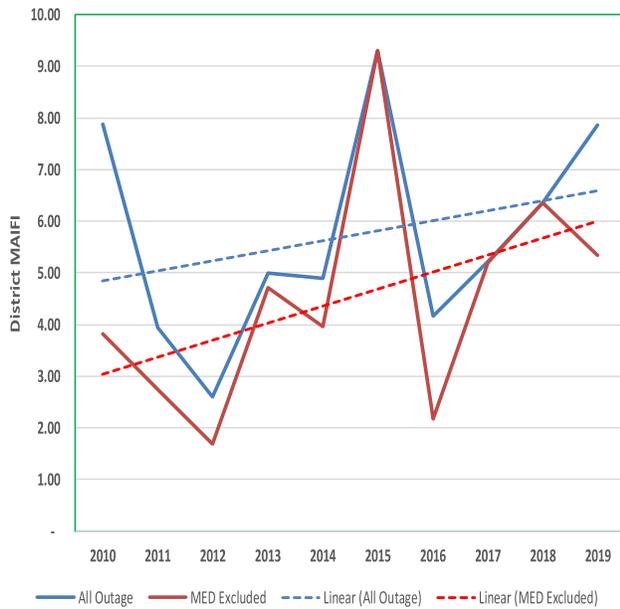
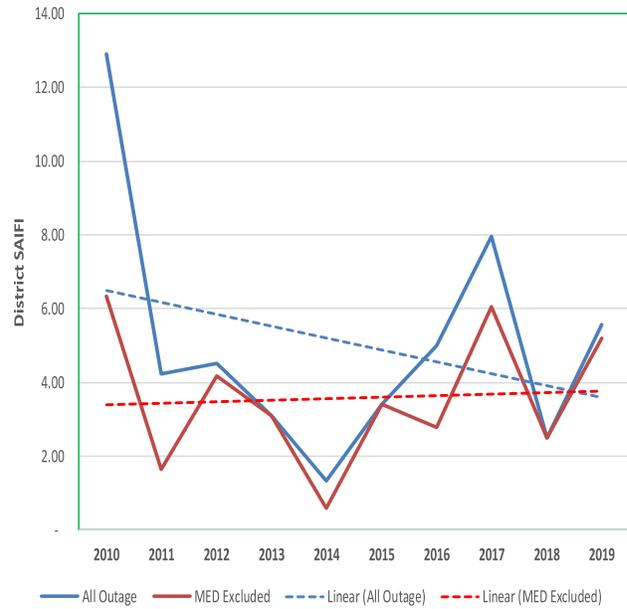
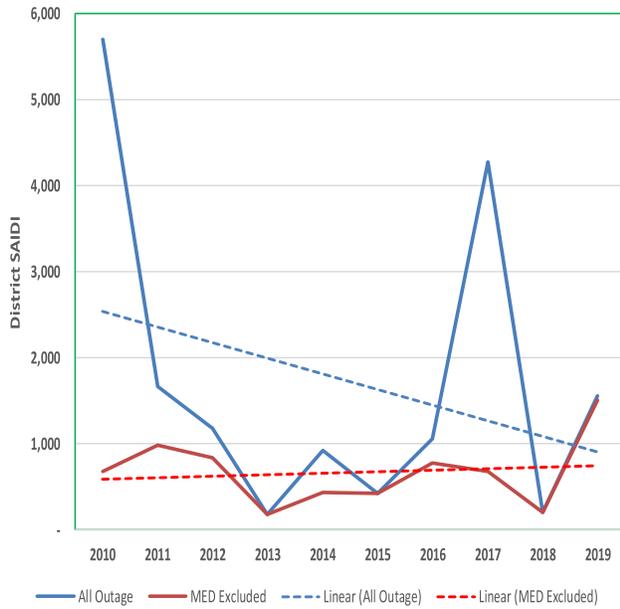
SANTA BARBARA District Reliability Performance



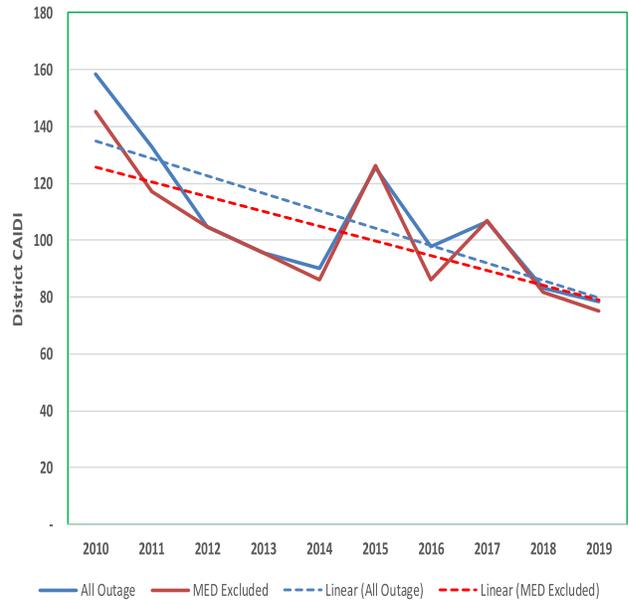
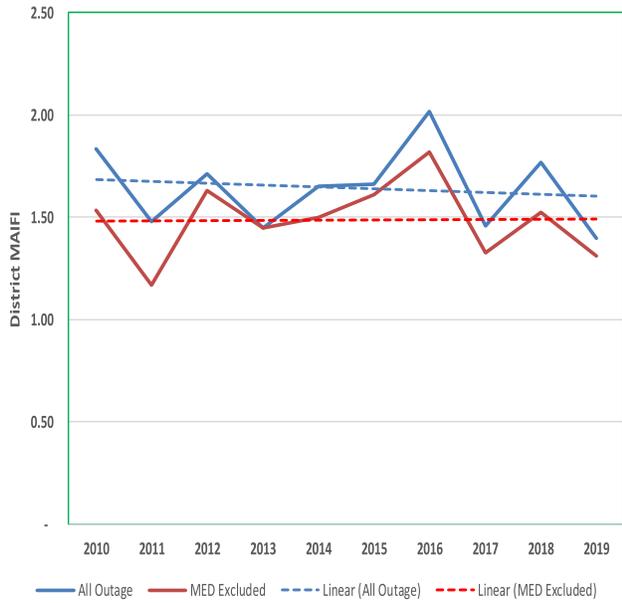
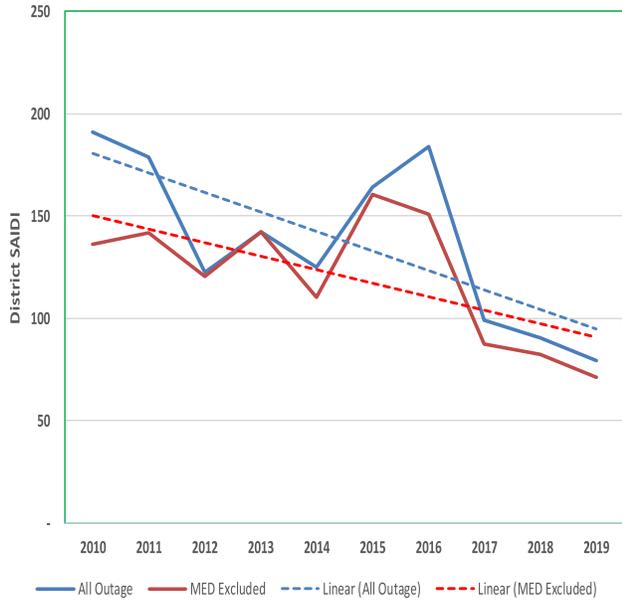
SANTA MONICA District Reliability Performance



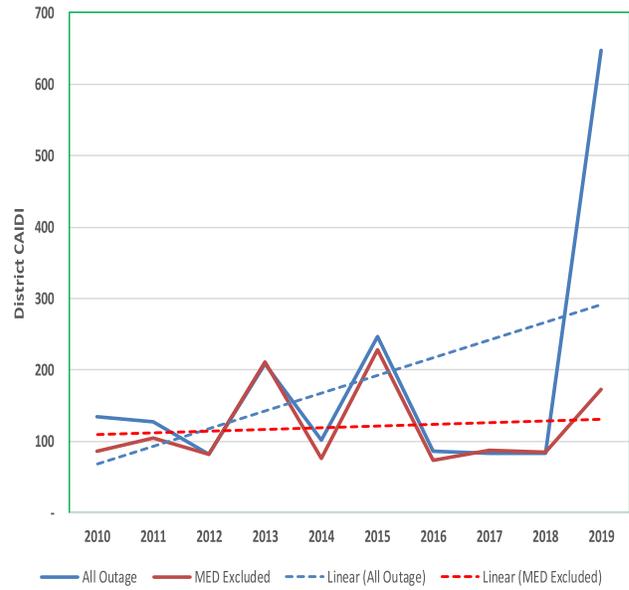
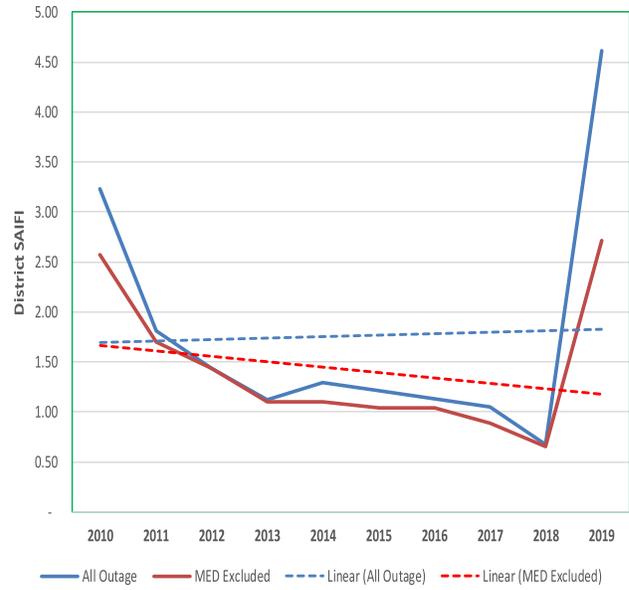
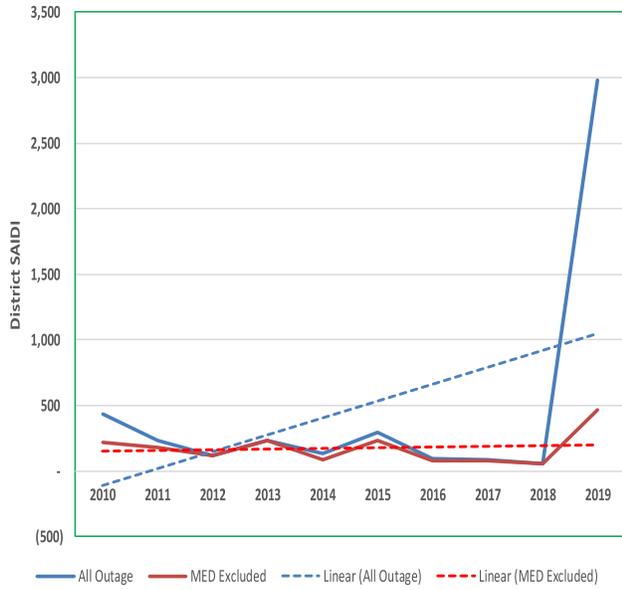
SHAVER LAKE District Reliability Performance



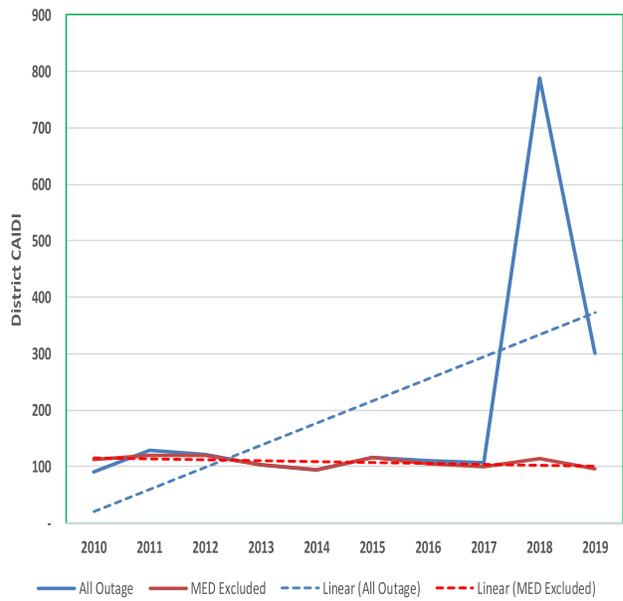
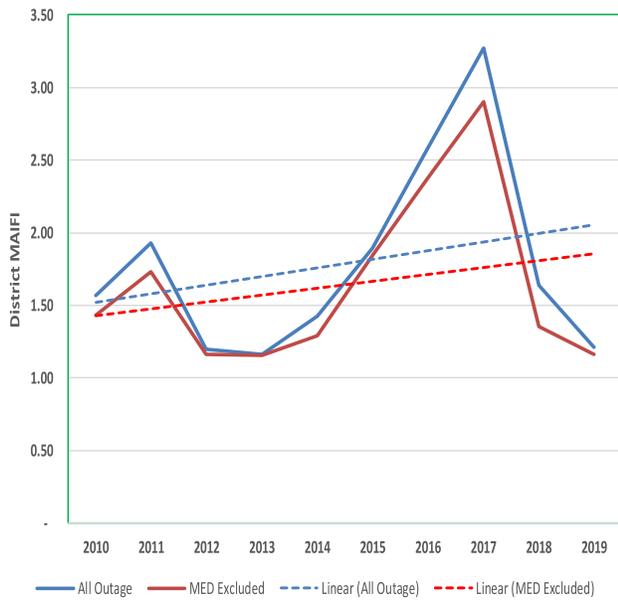
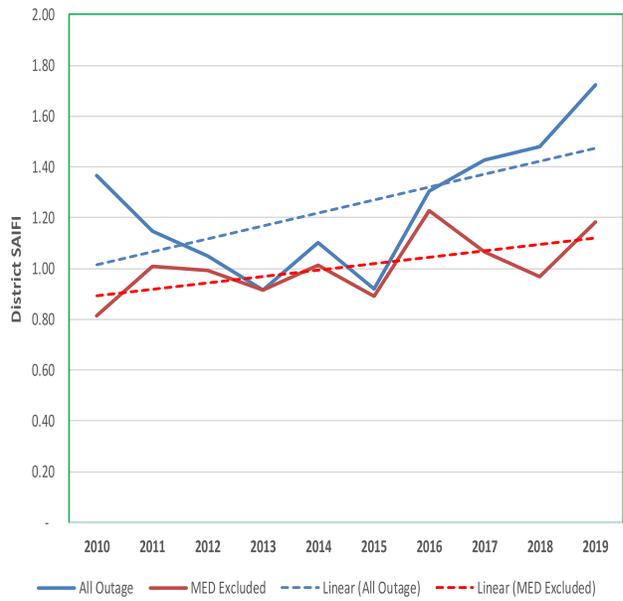
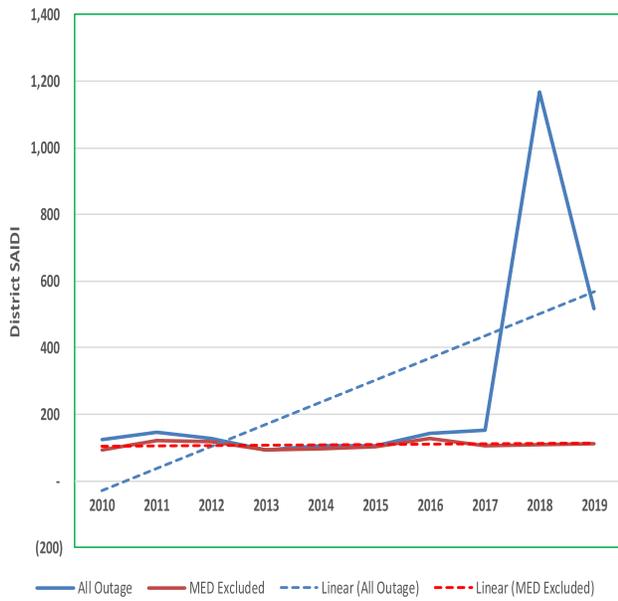
SOUTH BAY District Reliability Performance



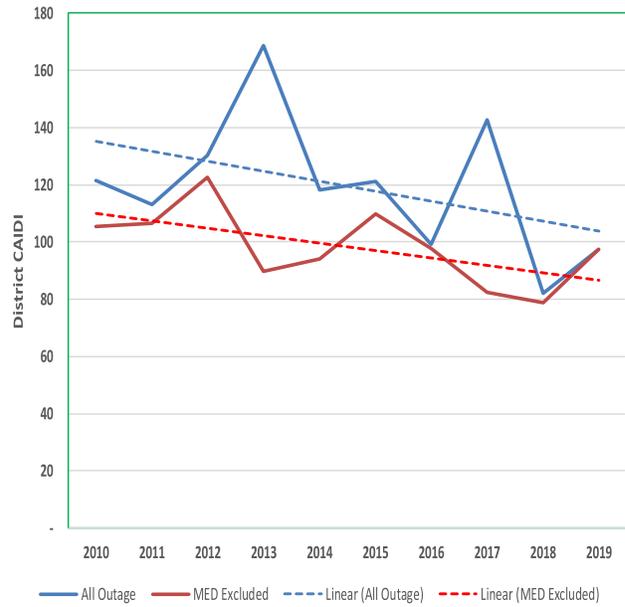
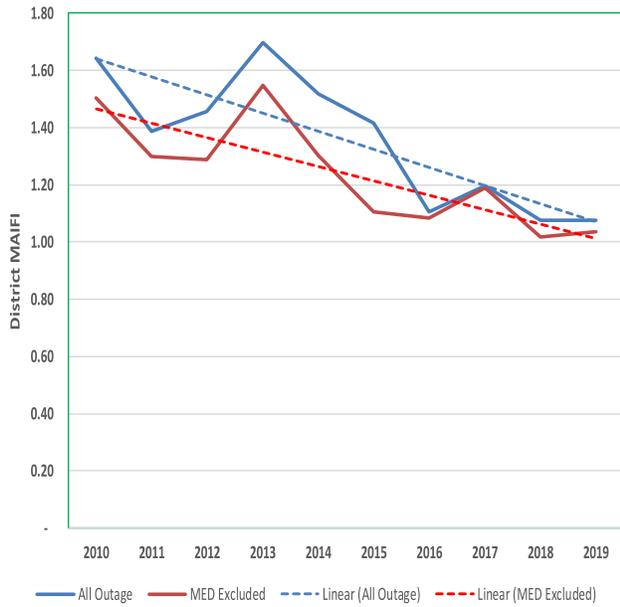
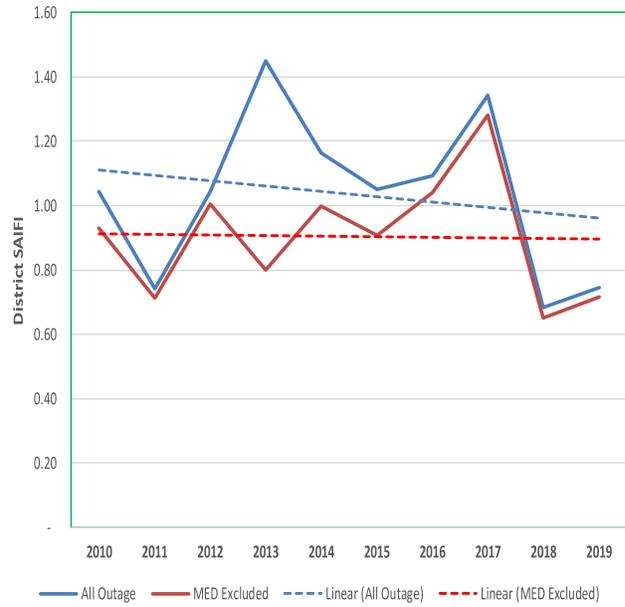
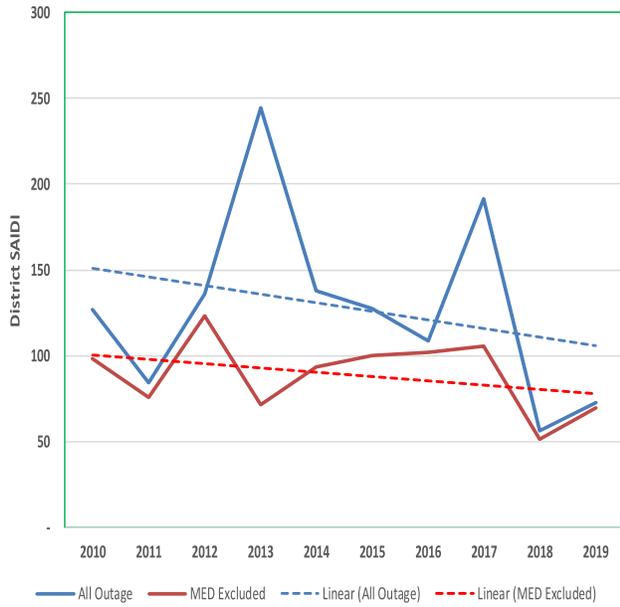
TEHACHAPI District Reliability Performance



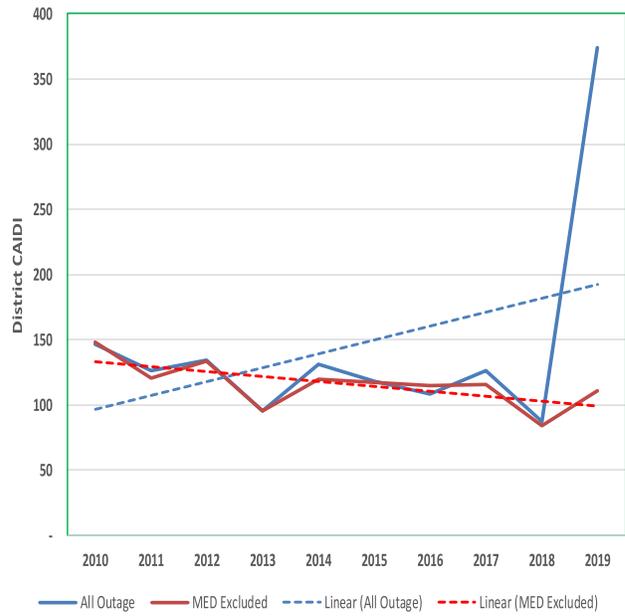
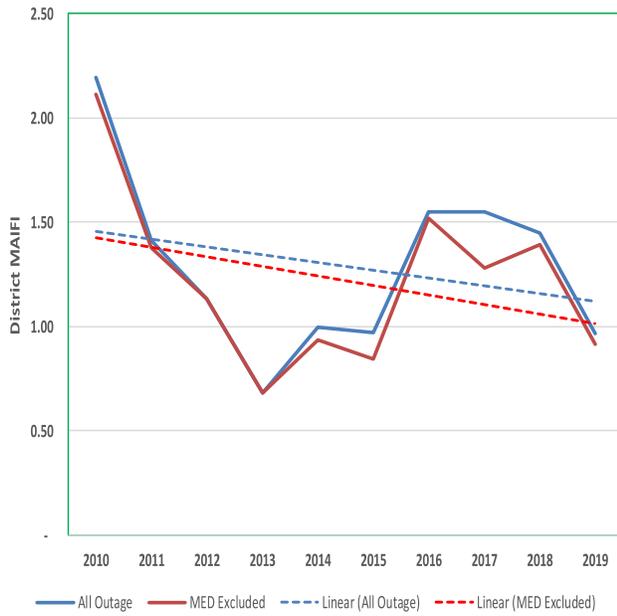
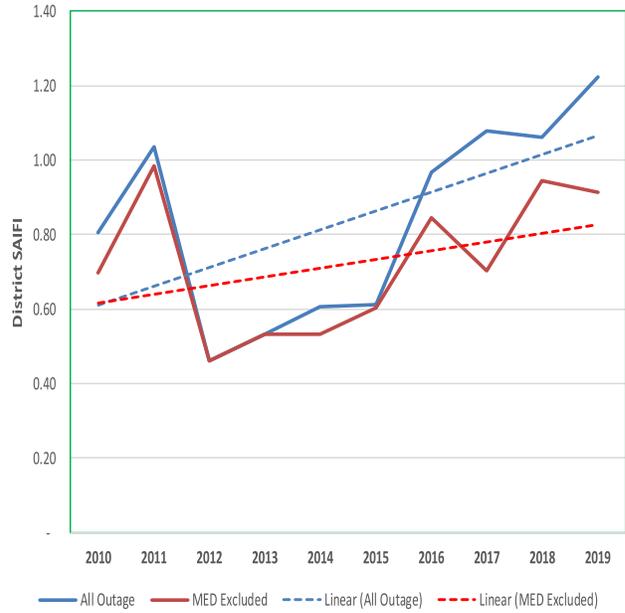
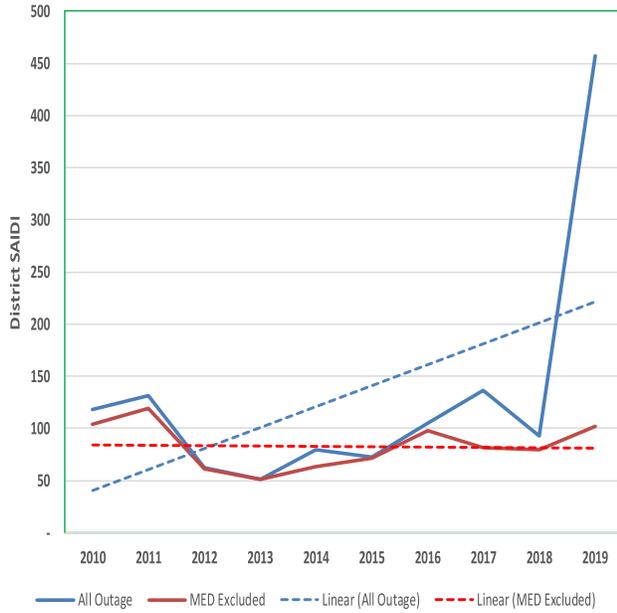
THOUSAND OAKS District Reliability Performance



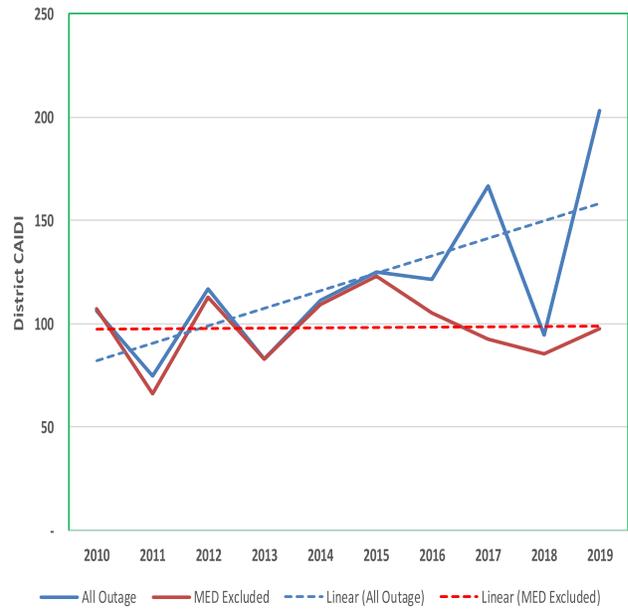
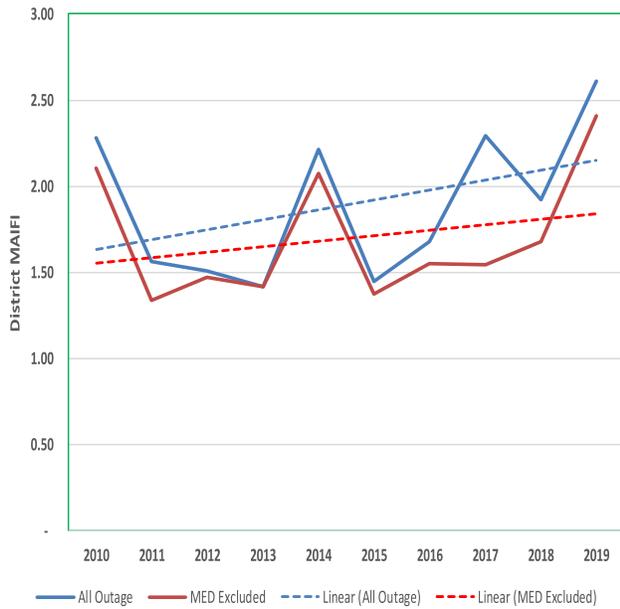
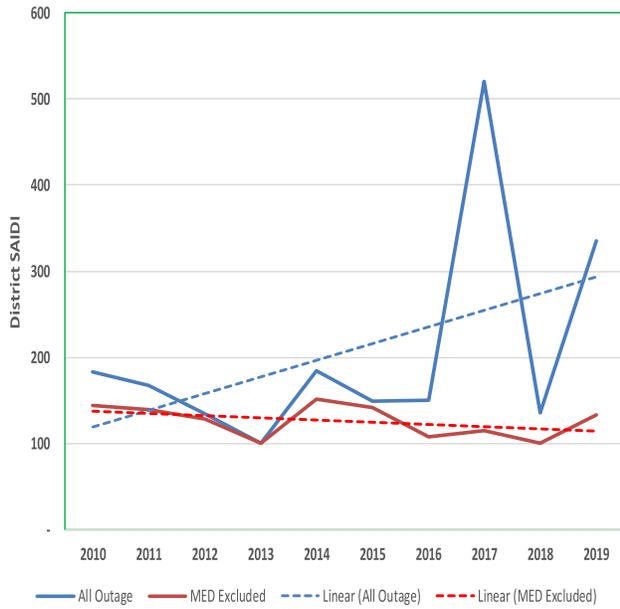
TULARE District Reliability Performance



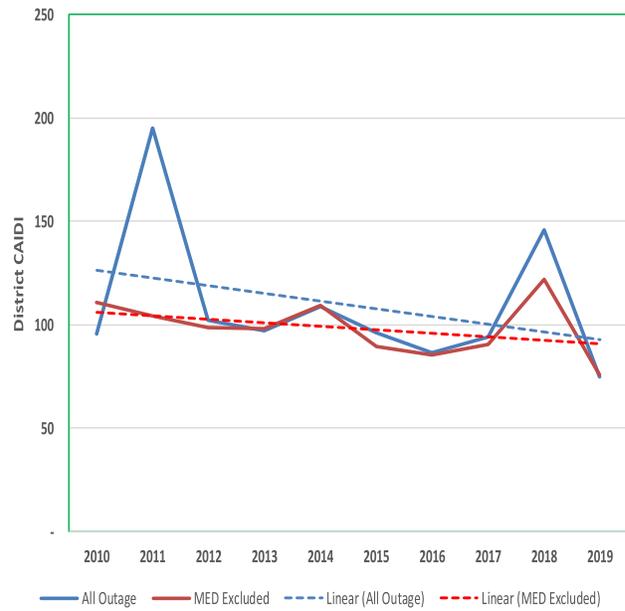
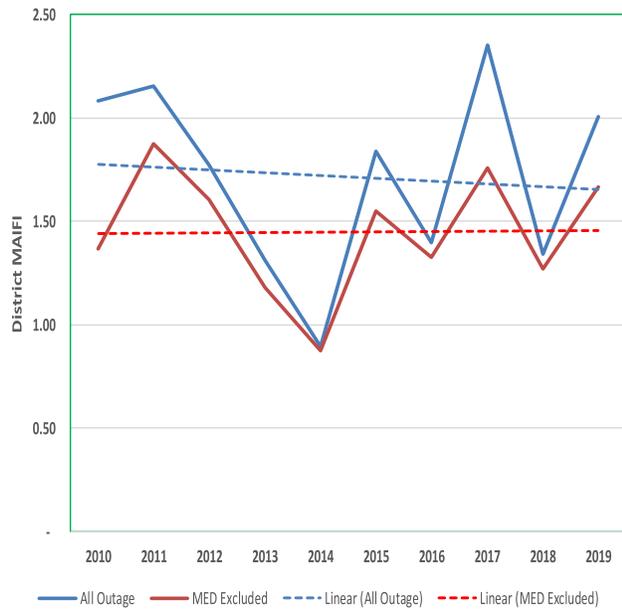
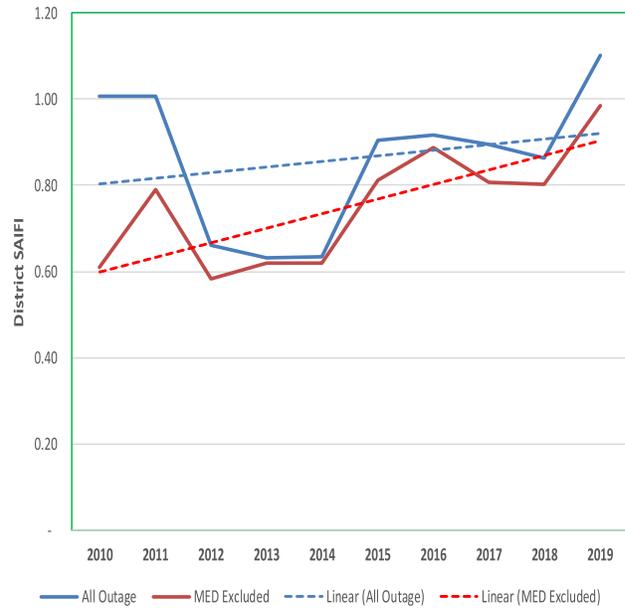
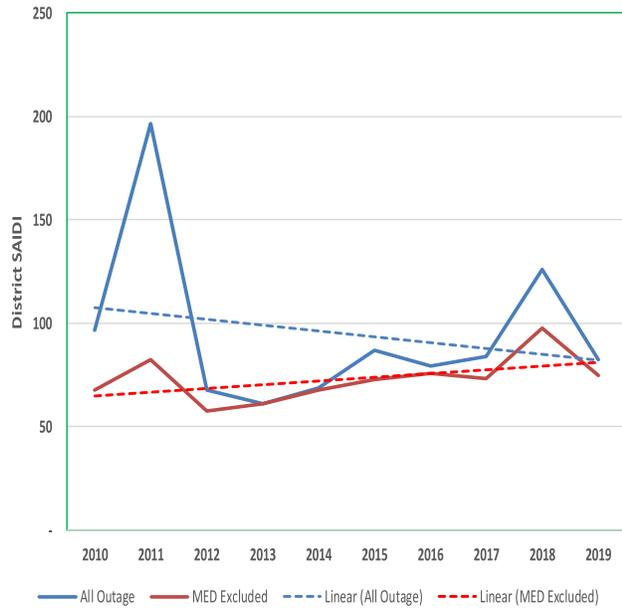
VALENCIA District Reliability Performance



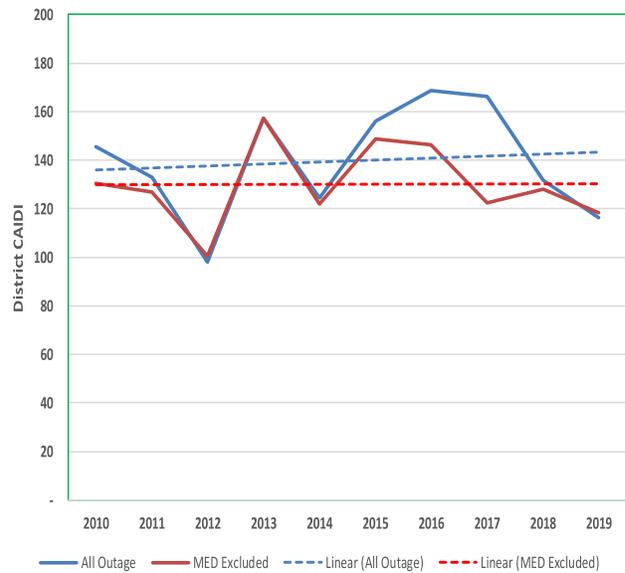
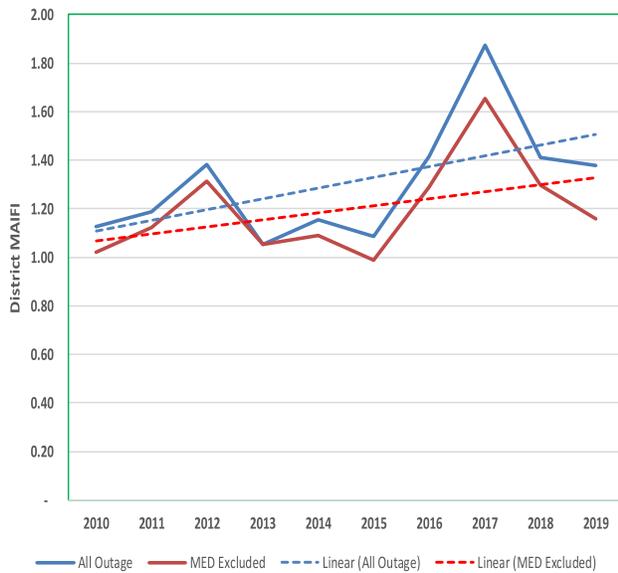
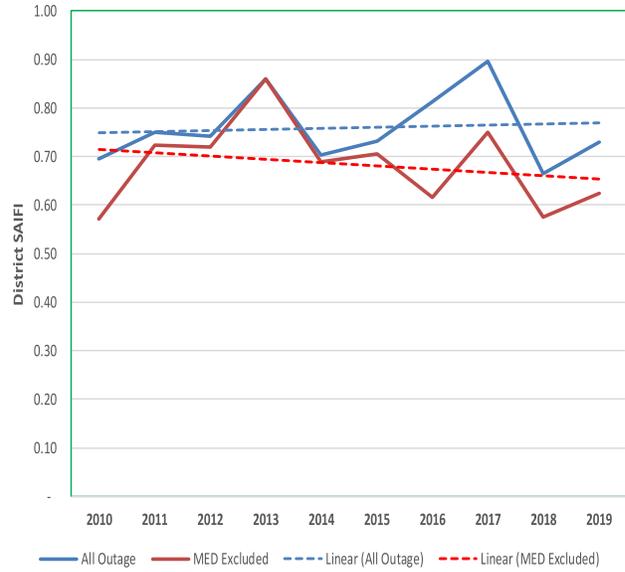
VENTURA District Reliability Performance



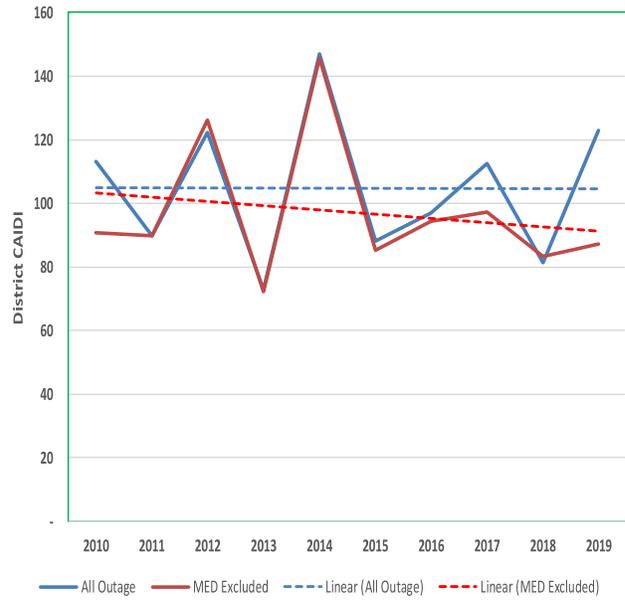
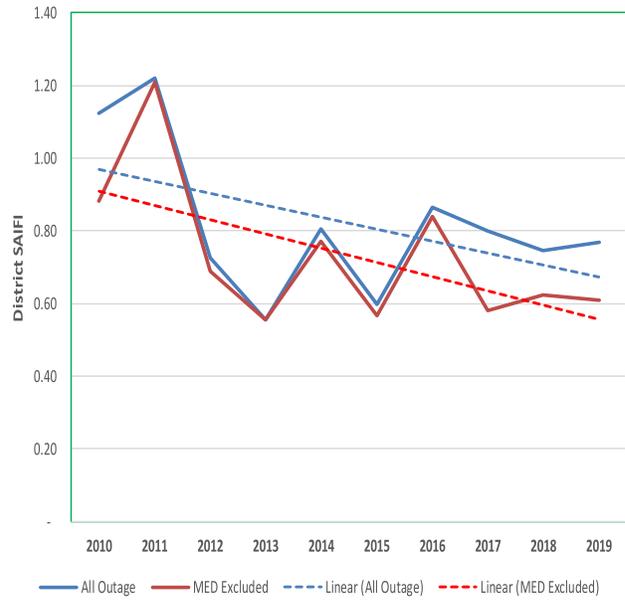
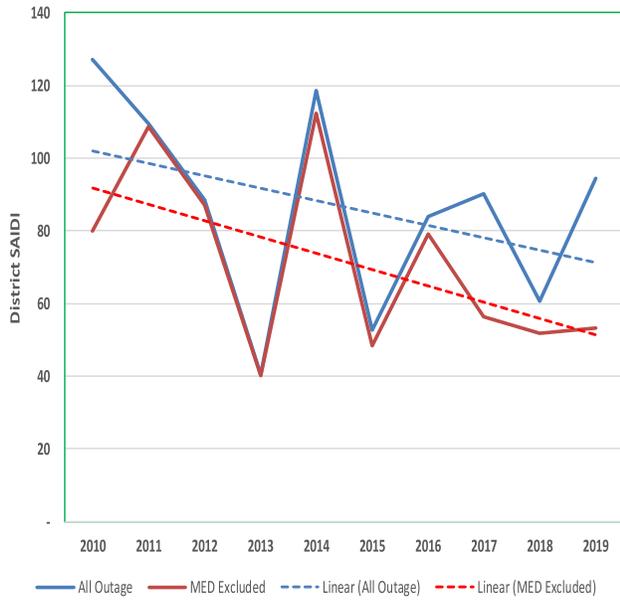
VICTORVILLE District Reliability Performance



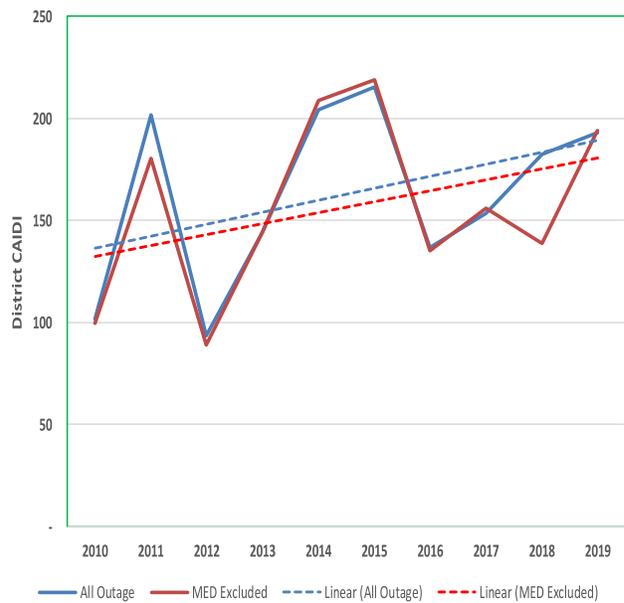
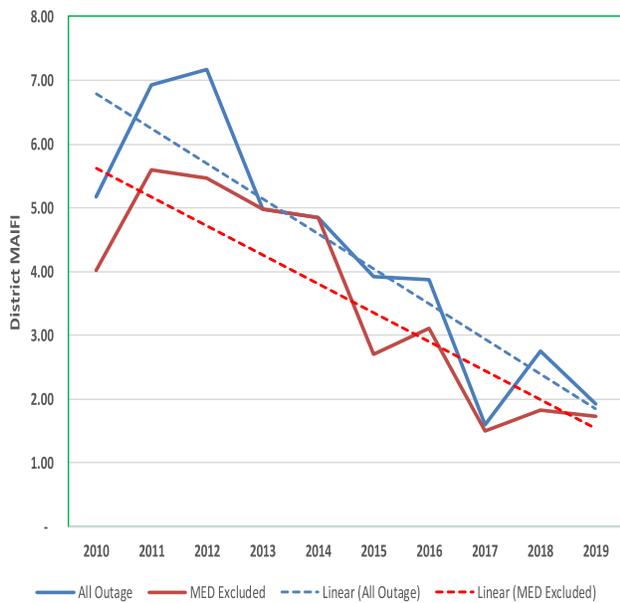
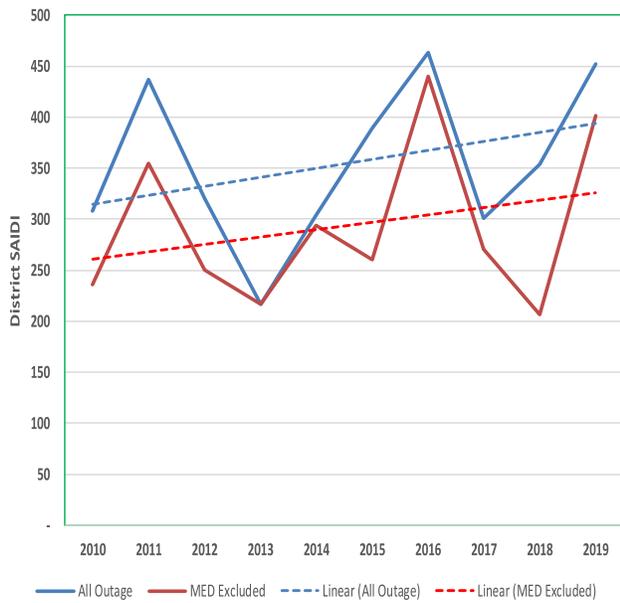
WHITTIER District Reliability Performance



WILDOMAR District Reliability Performance



YUCCA VALLEY District Reliability Performance



SECTION 3: SYSTEM AND DISTRICT INDICES BASED ON IEEE 1366 FOR THE PAST 10 YEARS INCLUDING PLANNED AND UNPLANNED OUTAGES AND INCLUDING AND EXCLUDING MED

Table 5 below contains the required SAIDI, SAIFI, MAIFI⁹ and CAIDI indices for 2010-2019 including and excluding Major Event Day (MED) for the SCE System, Planned and Unplanned outages combined. All calculations contained in the table are based on the IEEE 1366 method for Major Event Day (MED). Planned outages are not excluded on Major Event Days.

Table 5 – System Indices (2010-2019) Planned and Unplanned¹⁰

YEAR	SAIDI	SAIFI	MAIFI	CAIDI	SAIDI	SAIFI	MAIFI	CAIDI
2010	140.91	1.05	1.69	134.56	98.69	0.82	1.41	120.99
2011	232.39	1.04	1.53	223.75	108.15	0.91	1.36	118.30
2012	108.13	0.89	1.43	121.10	100.70	0.86	1.35	117.76
2013	102.61	0.91	1.20	112.76	94.48	0.88	1.18	107.85
2014	112.10	0.97	1.36	116.04	92.30	0.86	1.23	106.82
2015	114.83	0.92	1.42	125.40	100.15	0.86	1.29	116.56
2016	265.83	1.44	1.56	184.43	241.33	1.33	1.41	180.78
2017	261.24	1.52	1.84	171.33	213.24	1.20	1.43	177.30
2018	248.61	1.19	1.44	209.34	183.05	1.03	1.27	177.80
2019	243.71	1.24	1.39	196.14	156.48	1.07	1.23	146.36

⁹ SCE calculates MAIFI at every individual outage event.

¹⁰ 2016 was the first year SCE included a full year of planned outage reliability indices.

Table 6 below contains the District SAIDI, SAIFI, MAIFI and CAIDI (including and excluding MED).

Table 6 – District Indices (2010-2019) Planned and Unplanned¹¹

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
ANTELOPE VALLEY								
2010	131.063	0.773	2.022	169.484	74.576	0.524	1.321	142.319
2011	208.159	1.247	1.669	166.965	128.137	1.144	1.595	111.981
2012	78.604	0.565	1.428	139.172	76.461	0.549	1.412	139.354
2013	94.416	0.619	1.172	152.621	94.222	0.613	1.166	153.772
2014	50.956	0.593	1.153	85.927	45.595	0.548	1.070	83.156
2015	104.337	0.680	1.838	153.528	70.206	0.601	1.514	116.783
2016	174.941	1.096	1.528	159.616	168.470	1.040	1.435	161.952
2017	185.114	1.130	1.835	163.840	165.274	1.071	1.706	154.388
2018	119.431	0.807	1.261	147.930	114.236	0.733	1.100	155.803
2019	240.391	0.814	1.348	295.430	122.043	0.715	1.251	170.670
ARROWHEAD								
2010	537.400	3.841	18.875	139.895	229.659	1.974	16.782	116.369
2011	792.792	4.403	6.090	180.074	444.698	2.992	5.736	148.605
2012	129.579	1.307	3.972	99.116	89.043	1.043	3.757	85.372
2013	180.586	1.386	5.017	130.286	134.768	1.174	3.637	114.839
2014	193.249	1.590	4.018	121.532	81.968	0.898	3.035	91.277
2015	362.615	3.973	5.595	91.273	186.743	2.755	2.730	67.794
2016	753.996	3.192	5.974	236.234	295.253	2.226	4.734	132.620
2017	944.146	4.279	7.078	220.651	345.959	3.476	4.114	99.515
2018	435.669	2.568	3.047	169.674	420.495	1.752	2.987	239.951
2019	4033.976	10.677	9.951	377.810	1231.609	6.899	6.228	178.508
BARSTOW								
2010	123.015	1.511	3.041	81.440	96.881	1.190	2.648	81.400
2011	308.760	1.631	6.115	189.288	271.659	1.549	5.735	175.418
2012	184.797	1.152	2.645	160.377	182.786	1.144	2.524	159.819
2013	204.329	1.395	3.284	146.469	185.788	1.286	2.702	144.416
2014	201.526	1.343	2.536	150.058	173.680	1.240	2.410	140.098
2015	187.113	1.174	2.859	159.416	157.379	0.997	2.131	157.841
2016	187.771	1.538	2.299	122.114	183.028	1.527	2.286	119.823
2017	408.931	2.815	4.197	145.248	407.527	2.802	4.134	145.417
2018	151.136	1.488	2.113	101.551	149.712	1.457	2.079	102.777
2019	155.541	0.968	2.590	160.692	136.279	0.933	2.192	146.046
BISHOP								
2010	407.920	2.502	5.664	163.016	293.294	2.332	4.251	125.792
2011	666.064	1.548	2.571	430.339	105.588	1.344	2.247	78.591
2012	463.093	1.248	2.288	371.138	424.766	1.103	2.205	384.980
2013	104.436	0.514	1.267	203.233	104.425	0.514	1.267	203.232
2014	118.793	0.587	1.885	202.475	113.618	0.499	1.706	227.572
2015	298.106	2.218	3.332	134.431	298.106	2.218	3.272	134.431
2016	332.005	1.678	2.830	197.843	331.943	1.678	2.721	197.818
2017	457.095	2.893	3.264	157.984	438.728	2.836	3.118	154.713
2018	343.456	1.074	1.970	319.777	340.230	1.033	1.833	329.211
2019	1557.892	3.240	3.229	480.782	388.315	1.719	2.889	225.840
BLYTHE								
2010	1332.781	2.030	2.817	656.668	294.445	1.344	2.641	219.114
2011	378.393	1.402	3.717	269.845	321.050	1.312	3.443	244.767
2012	225.884	1.529	3.749	147.714	221.814	1.498	3.749	148.058
2013	483.127	1.380	5.466	349.971	482.815	1.372	5.382	351.779
2014	707.218	2.417	4.658	292.632	706.974	2.385	4.433	296.395
2015	426.997	1.515	1.396	281.754	331.521	1.129	1.163	293.751
2016	649.170	3.562	6.349	182.233	555.778	2.773	4.854	200.447
2017	1100.260	3.321	3.586	331.330	1099.341	3.316	3.494	331.554
2018	598.157	2.515	2.421	237.811	576.042	2.266	2.390	254.206
2019	450.954	1.976	2.773	228.239	431.102	1.912	2.680	225.424

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
COMPTON								
2010	119.230	0.779	1.578	153.004	88.110	0.585	1.337	150.626
2011	109.414	0.718	1.566	152.338	90.548	0.644	1.433	140.680
2012	117.225	0.824	1.863	142.330	110.077	0.792	1.830	139.031
2013	89.167	0.797	1.938	111.893	89.167	0.797	1.938	111.893
2014	82.192	0.711	1.603	115.553	73.493	0.656	1.560	111.977
2015	130.629	0.967	2.049	135.097	126.046	0.934	1.958	134.903
2016	288.090	1.398	2.541	206.024	268.861	1.301	2.232	206.699
2017	237.826	1.064	2.167	223.572	200.861	0.957	1.972	209.891
2018	153.029	0.995	2.448	153.748	126.041	0.861	2.267	146.325
2019	136.345	0.961	2.091	141.813	102.234	0.794	1.722	128.839
COVINA								
2010	117.660	0.810	1.130	145.299	99.323	0.708	0.983	140.232
2011	166.969	0.870	1.181	191.870	86.994	0.736	1.077	118.129
2012	108.732	0.915	1.333	118.824	102.888	0.867	1.267	118.680
2013	100.505	0.856	1.004	117.414	100.297	0.853	0.992	117.582
2014	91.418	0.874	1.257	104.580	81.424	0.804	1.028	101.295
2015	100.085	0.815	1.164	122.866	99.838	0.813	1.152	122.755
2016	239.474	1.288	1.323	185.960	218.270	1.189	1.149	183.532
2017	204.581	1.183	1.371	172.991	193.489	1.062	1.144	182.171
2018	195.693	1.071	1.458	182.671	165.975	0.939	1.370	176.714
2019	145.040	1.060	1.001	136.874	137.590	0.996	0.925	138.125
FOOTHILL								
2010	76.599	0.460	0.975	166.649	64.982	0.405	0.857	160.634
2011	117.405	0.955	1.226	122.901	97.462	0.879	0.896	110.915
2012	91.694	0.903	0.931	101.552	91.479	0.900	0.900	101.608
2013	85.800	0.787	0.987	109.087	85.800	0.787	0.987	109.087
2014	93.337	0.932	1.285	100.140	88.135	0.861	1.249	102.395
2015	109.637	0.947	1.304	115.764	87.796	0.890	1.230	98.673
2016	268.951	1.422	1.512	189.100	264.322	1.403	1.488	188.437
2017	233.590	1.562	1.390	149.574	211.063	1.334	1.216	158.270
2018	250.380	1.411	1.208	177.480	211.469	1.216	0.972	173.904
2019	359.350	1.314	1.112	273.389	154.899	1.060	1.072	146.152
FULLERTON								
2010	135.217	1.186	1.208	113.985	94.282	0.671	0.859	140.606
2011	90.110	0.607	1.076	148.499	88.745	0.604	1.075	146.940
2012	68.992	0.419	0.943	164.469	64.428	0.401	0.878	160.539
2013	90.572	0.793	0.910	114.158	90.572	0.793	0.910	114.158
2014	82.201	0.723	1.004	113.714	69.996	0.649	0.974	107.848
2015	76.586	0.669	1.014	114.471	75.504	0.642	0.995	117.681
2016	204.966	1.107	1.179	185.149	186.013	0.936	0.979	198.795
2017	194.061	0.997	1.212	194.721	178.928	0.905	1.086	197.812
2018	142.016	0.743	1.128	191.051	127.951	0.661	1.043	193.581
2019	115.396	0.897	1.093	128.589	106.071	0.832	1.024	127.560
HUNTINGTON BEACH								
2010	128.850	1.028	1.299	125.336	101.190	0.855	1.026	118.377
2011	121.939	0.982	1.507	124.158	114.002	0.911	1.426	125.083
2012	95.604	0.887	1.043	107.743	94.511	0.880	1.043	107.404
2013	66.914	0.703	0.839	95.123	66.914	0.703	0.839	95.123
2014	77.109	0.774	1.105	99.638	65.695	0.712	0.978	92.256
2015	97.731	0.969	1.235	100.904	93.570	0.942	1.187	99.287
2016	252.325	1.686	1.252	149.657	232.673	1.611	1.191	144.450
2017	205.972	1.336	1.466	154.135	186.124	1.216	1.197	153.003
2018	173.878	1.061	1.380	163.906	159.882	0.979	1.080	163.389
2019	148.606	1.185	1.148	125.413	132.730	1.063	0.976	124.808
KERNVILLE								
2010	584.742	1.795	4.336	325.686	444.191	1.490	4.011	298.084
2011	165.695	1.025	3.316	161.713	138.134	0.964	2.620	143.346
2012	226.761	1.311	3.636	172.995	160.694	1.066	3.010	150.692
2013	232.181	1.964	4.925	118.189	180.865	1.577	4.824	114.682
2014	178.691	1.987	1.882	89.932	142.946	1.918	1.831	74.541
2015	286.382	0.961	1.630	297.920	231.411	0.857	1.293	270.120
2016	2729.902	4.545	3.102	600.638	1217.766	3.710	3.006	328.213
2017	610.622	4.144	4.587	147.356	595.690	4.006	4.288	148.701
2018	536.123	2.004	3.168	267.559	504.530	1.872	3.152	269.457
2019	612.156	2.474	3.998	247.479	609.519	2.468	3.995	246.932

¹¹ For 2010 - 2019, Catalina District charts have been combined with Huntington Beach District since the Catalina District operations have been combined with the Huntington Beach District.

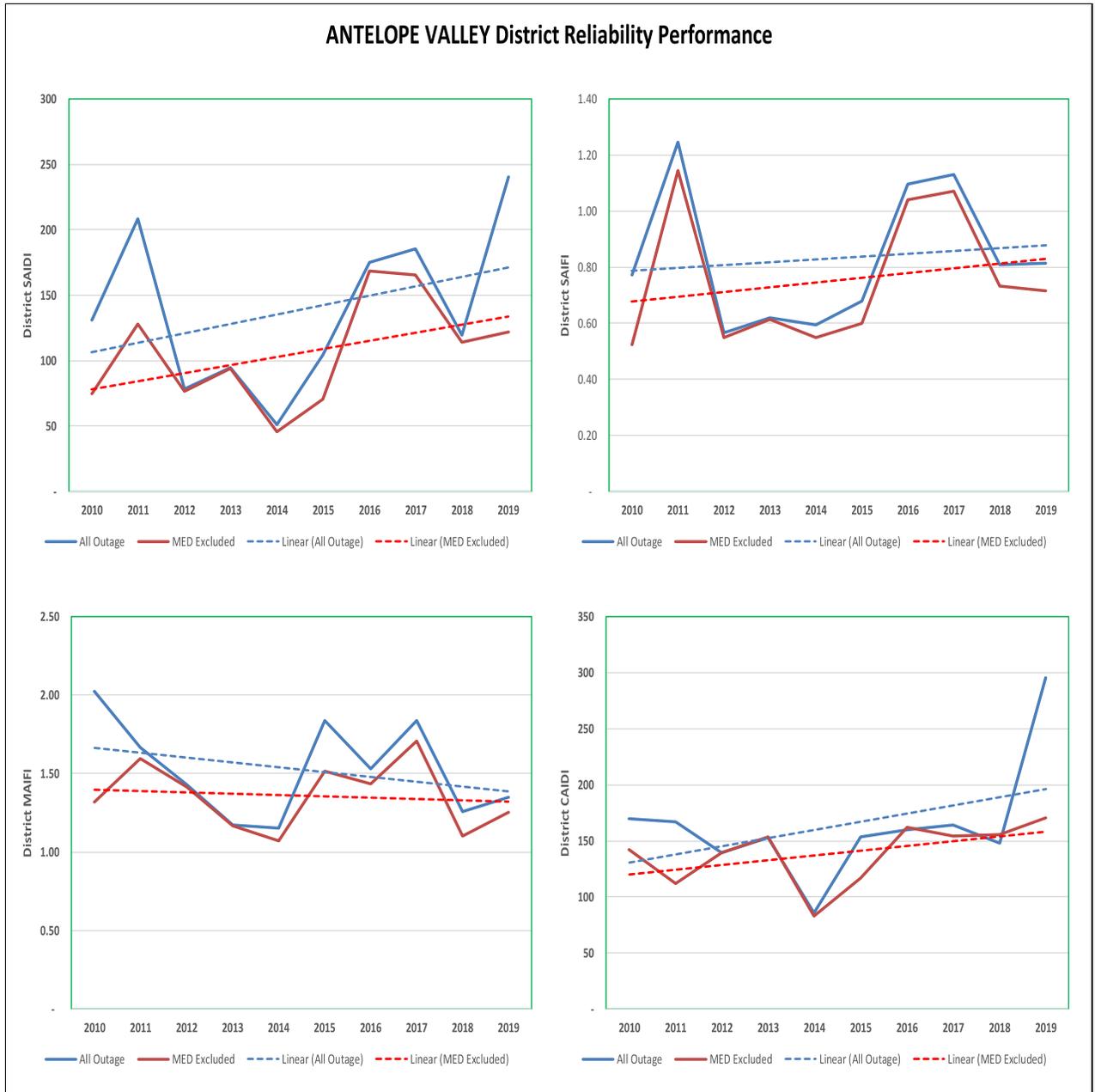
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
LONG BEACH								
2010	72.284	0.633	0.897	114.156	53.982	0.546	0.774	98.809
2011	58.475	0.579	0.894	100.942	52.380	0.562	0.853	93.191
2012	75.830	0.554	1.106	136.864	72.654	0.536	1.059	135.673
2013	75.107	0.699	0.779	107.497	74.628	0.694	0.775	107.551
2014	66.226	0.606	1.168	109.270	57.781	0.548	1.083	105.376
2015	164.463	0.894	1.185	183.904	89.160	0.846	1.168	105.378
2016	258.116	1.151	1.312	224.274	219.930	0.989	1.099	222.387
2017	167.261	0.916	1.180	182.537	149.590	0.798	1.021	187.474
2018	169.862	0.725	1.225	234.380	160.684	0.679	1.102	236.556
2019	137.008	0.818	0.974	167.445	118.994	0.747	0.827	159.244
MENIFEE								
2010	100.653	0.762	1.202	132.119	74.081	0.613	0.903	120.754
2011	100.482	0.891	1.339	112.728	93.705	0.804	1.299	116.607
2012	99.320	0.838	1.736	118.576	98.627	0.824	1.680	119.740
2013	107.388	1.264	0.744	84.979	106.298	1.220	0.725	87.135
2014	156.641	1.323	1.573	118.410	77.367	1.004	1.276	77.030
2015	111.460	0.978	1.302	113.971	85.322	0.876	1.067	97.393
2016	272.761	1.691	1.450	161.345	255.018	1.570	1.340	162.435
2017	210.646	1.250	1.314	168.458	153.033	1.051	1.203	145.610
2018	267.524	1.242	1.446	215.395	164.418	1.040	1.279	158.045
2019	169.011	1.096	1.031	154.267	146.419	0.987	0.865	148.373
MONROVIA								
2010	124.340	1.078	2.014	115.381	93.507	0.902	1.775	103.624
2011	2414.044	1.891	2.463	1276.874	130.692	1.025	1.740	127.514
2012	108.110	1.126	1.781	95.987	99.185	1.068	1.632	92.910
2013	99.116	1.017	1.322	97.496	98.965	1.015	1.311	97.500
2014	133.311	1.157	1.258	115.176	96.360	1.005	1.069	95.846
2015	96.679	0.881	1.618	109.737	95.327	0.863	1.554	110.466
2016	256.395	1.176	1.660	218.071	233.207	1.103	1.531	211.395
2017	271.780	1.370	1.804	198.422	258.774	1.313	1.706	197.034
2018	410.435	1.837	1.632	223.466	269.995	1.440	1.471	187.519
2019	197.053	1.118	1.402	176.237	186.919	1.018	1.242	183.598
MONTEBELLO								
2010	147.851	1.117	1.987	132.361	118.232	0.972	1.688	121.649
2011	678.332	1.214	2.388	558.556	115.694	0.853	1.821	135.577
2012	131.058	1.127	1.946	116.316	107.511	1.040	1.823	103.423
2013	118.078	1.174	1.890	100.609	117.713	1.169	1.890	100.660
2014	158.316	1.164	1.959	136.010	124.669	1.020	1.763	122.179
2015	150.280	1.183	2.213	126.992	145.303	1.131	2.087	128.462
2016	352.148	1.632	2.066	215.752	325.890	1.509	1.892	215.923
2017	253.609	1.299	2.186	195.262	226.482	1.187	1.878	190.834
2018	302.525	1.397	2.271	216.561	240.523	1.116	1.861	215.502
2019	200.865	1.365	1.908	147.132	181.730	1.231	1.792	147.649
ONTARIO								
2010	90.448	0.811	1.480	111.528	70.279	0.655	1.258	107.242
2011	117.664	0.822	1.317	143.189	96.594	0.749	1.235	128.944
2012	93.087	0.869	1.159	107.130	91.407	0.833	1.140	109.720
2013	77.392	0.791	0.933	97.841	74.037	0.782	0.926	94.728
2014	97.881	0.996	1.160	98.312	86.676	0.902	1.041	96.114
2015	94.043	0.744	0.926	126.432	81.608	0.709	0.867	115.156
2016	227.939	1.274	1.288	178.977	209.030	1.146	1.101	182.411
2017	207.596	1.448	1.575	143.412	198.946	1.367	1.426	145.565
2018	179.063	1.015	1.051	176.468	152.457	0.880	0.921	173.172
2019	143.316	1.120	1.212	127.952	130.101	1.041	1.146	124.971
PALM SPRINGS								
2010	180.688	1.039	1.367	173.826	162.059	0.940	1.148	172.391
2011	164.765	0.886	1.182	186.029	144.131	0.842	1.117	171.272
2012	175.916	1.267	1.505	138.814	113.848	1.130	1.236	100.717
2013	112.796	0.774	0.997	145.669	112.193	0.769	0.997	145.815
2014	106.960	0.708	0.941	151.072	95.065	0.667	0.885	142.620
2015	99.542	0.800	1.042	124.376	95.795	0.753	0.949	127.171
2016	258.243	1.521	1.284	169.743	252.026	1.465	1.136	171.990
2017	230.013	1.398	1.228	164.565	227.345	1.374	1.218	165.435
2018	189.052	1.176	1.433	160.817	175.409	1.113	1.215	157.626
2019	207.039	1.474	1.626	140.500	164.874	1.156	1.302	142.645

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
REDLANDS								
2010	216.759	1.692	3.207	128.121	95.898	1.332	2.692	71.988
2011	253.703	1.630	1.323	155.689	142.273	1.428	1.244	99.628
2012	120.127	1.108	1.600	108.399	114.781	1.068	1.563	107.435
2013	96.481	1.044	0.911	92.410	95.273	1.036	0.908	91.977
2014	154.227	1.040	1.312	148.311	85.520	0.872	1.149	98.024
2015	124.519	1.012	1.467	122.990	102.289	0.935	1.247	109.365
2016	237.564	1.273	1.477	186.559	219.230	1.178	1.339	186.054
2017	243.956	1.325	1.603	184.160	213.812	1.172	1.414	182.408
2018	189.472	1.278	1.371	148.255	171.551	1.138	1.217	150.778
2019	285.937	1.508	1.410	189.660	174.968	1.203	1.246	145.497
RIDGECREST								
2010	153.378	1.410	2.219	108.746	151.176	1.394	1.850	108.443
2011	89.261	0.737	4.140	121.196	67.647	0.528	3.916	128.124
2012	229.646	1.439	3.738	159.634	228.264	1.421	3.711	160.656
2013	161.952	1.122	3.828	144.376	83.920	0.824	3.315	101.793
2014	176.795	1.573	2.193	112.388	167.746	1.509	2.180	111.181
2015	148.895	1.012	2.169	147.145	139.509	0.837	1.514	166.702
2016	287.217	1.150	1.285	249.712	282.115	1.043	1.162	270.433
2017	316.092	1.432	3.535	220.660	305.387	1.410	3.463	216.606
2018	385.241	1.485	1.311	259.389	230.455	1.118	1.301	206.202
2019	337.998	2.226	4.921	151.865	334.468	1.941	4.186	172.307
SADDLEBACK								
2010	137.236	0.962	0.433	142.663	96.192	0.778	0.373	123.677
2011	75.942	0.547	0.818	138.842	74.783	0.527	0.753	141.934
2012	83.013	0.728	0.766	113.998	81.379	0.715	0.765	113.864
2013	70.688	0.532	0.513	132.957	70.688	0.532	0.513	132.957
2014	99.074	0.745	0.556	133.025	92.899	0.708	0.549	131.230
2015	46.026	0.385	0.379	119.543	45.654	0.384	0.379	118.976
2016	159.284	0.959	0.781	166.143	155.758	0.916	0.740	170.123
2017	168.934	0.880	0.701	191.956	152.325	0.786	0.552	193.818
2018	127.416	0.629	0.414	202.577	117.442	0.568	0.365	206.817
2019	187.362	0.870	0.402	215.298	95.490	0.714	0.348	133.817
SANTA ANA								
2010	104.571	0.810	1.012	129.134	69.073	0.610	0.837	113.185
2011	102.008	0.816	1.104	125.033	93.837	0.778	1.068	120.566
2012	78.602	0.554	1.115	141.767	78.305	0.553	1.065	141.491
2013	93.345	0.742	1.019	125.854	93.345	0.742	1.019	125.854
2014	91.651	0.843	1.274	108.710	79.414	0.755	1.179	105.222
2015	67.457	0.706	1.130	95.596	66.452	0.703	1.109	94.562
2016	210.964	1.315	1.187	160.413	202.009	1.258	1.115	160.572
2017	157.257	0.957	1.271	164.245	142.549	0.855	1.121	166.774
2018	182.258	0.999	1.306	182.354	117.077	0.731	1.095	160.191
2019	105.309	0.718	0.865	146.593	100.963	0.663	0.822	152.197
SANTA BARBARA								
2010	151.187	1.008	2.228	149.999	138.640	0.888	1.887	156.212
2011	104.820	0.866	1.727	121.045	94.368	0.811	1.635	116.427
2012	153.813	1.148	1.673	133.954	149.352	1.127	1.456	132.567
2013	82.001	0.699	1.219	117.302	82.001	0.699	1.219	117.302
2014	181.231	1.335	2.549	135.717	145.165	1.141	2.012	127.238
2015	152.372	1.517	1.577	100.417	143.291	1.338	1.459	107.103
2016	355.518	1.829	1.477	194.407	328.861	1.687	1.263	194.963
2017	805.014	10.181	13.621	79.068	549.005	2.587	1.236	212.198
2018	586.424	2.087	1.244	280.962	499.093	1.973	1.043	252.974
2019	322.568	1.840	1.766	175.295	300.511	1.727	1.577	173.992
SANTA MONICA								
2010	98.323	0.894	1.124	109.948	73.036	0.689	1.054	105.987
2011	95.085	0.583	1.476	162.996	83.791	0.537	1.177	155.914
2012	101.687	0.792	0.911	128.436	98.428	0.769	0.890	127.913
2013	122.783	1.003	0.959	122.447	122.783	1.003	0.959	122.447
2014	110.742	0.992	0.852	111.609	106.656	0.943	0.772	113.131
2015	75.407	0.625	1.069	120.681	64.417	0.577	1.065	111.607
2016	180.178	1.196	1.217	150.691	178.204	1.181	1.138	150.850
2017	235.009	1.096	1.172	214.420	229.254	1.063	1.112	215.714
2018	199.328	1.356	1.364	146.947	179.489	1.028	1.332	174.645
2019	153.471	1.020	1.425	150.499	149.077	0.985	1.375	151.351

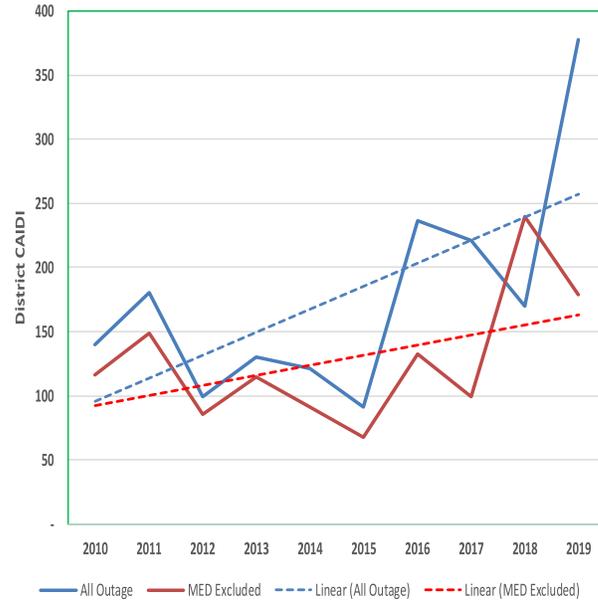
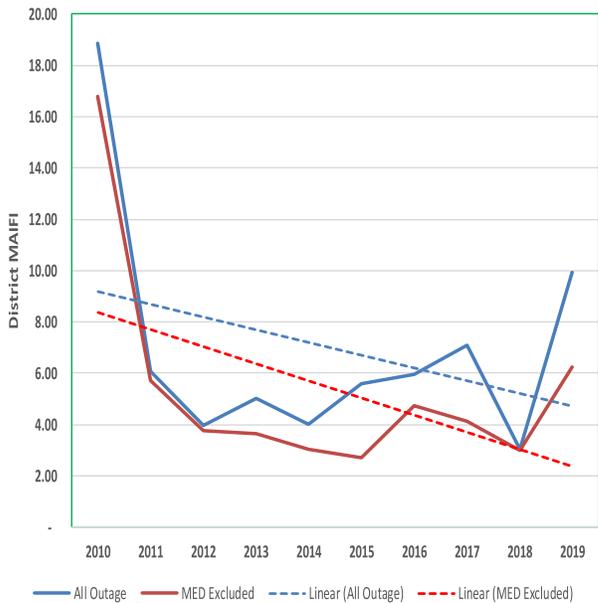
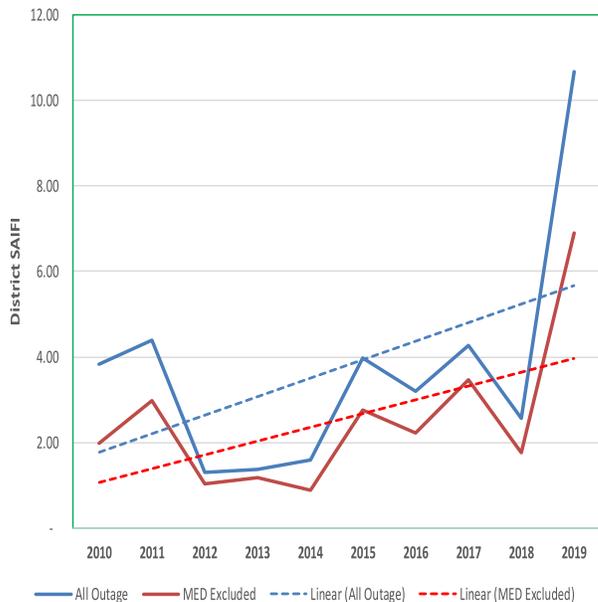
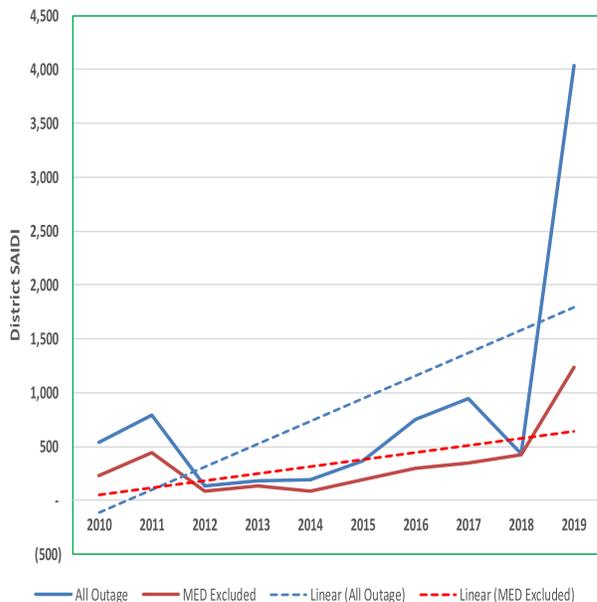
DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
SHAVER LAKE								
2010	5700.992	12.891	7.874	442.244	683.925	6.344	3.818	107.812
2011	1667.047	4.222	3.933	394.852	984.340	1.650	2.741	596.466
2012	1184.253	4.523	2.608	261.831	842.662	4.182	1.681	201.512
2013	176.510	3.080	4.987	57.308	176.510	3.080	4.711	57.308
2014	920.254	1.342	4.901	685.961	438.216	0.581	3.960	754.138
2015	422.768	3.415	9.298	123.785	422.768	3.415	9.298	123.785
2016	1672.107	7.236	4.232	231.067	1384.095	5.039	2.241	274.676
2017	5503.024	11.011	5.301	499.772	1905.726	9.103	5.278	209.351
2018	2012.829	6.742	6.660	298.567	2012.829	6.742	6.660	298.567
2019	2291.536	7.382	8.555	310.427	2236.388	7.009	6.043	319.088
SOUTH BAY								
2010	190.924	1.206	1.836	158.299	136.407	0.938	1.533	145.392
2011	178.724	1.347	1.481	132.690	141.550	1.207	1.169	117.293
2012	122.682	1.174	1.713	104.516	120.710	1.153	1.630	104.694
2013	142.153	1.490	1.448	95.391	142.153	1.490	1.448	95.391
2014	125.154	1.390	1.650	90.009	110.254	1.281	1.502	86.094
2015	164.072	1.305	1.660	125.704	160.399	1.272	1.613	126.136
2016	335.018	2.229	2.024	150.313	302.021	2.097	1.822	144.043
2017	268.368	1.330	1.467	201.767	256.529	1.217	1.335	210.758
2018	227.260	1.450	1.773	156.710	218.906	1.367	1.526	160.078
2019	163.727	1.227	1.400	133.424	155.910	1.167	1.315	133.579
TEHACHAPI								
2010	434.015	3.232	6.291	134.268	220.369	2.573	4.677	85.639
2011	231.229	1.814	3.190	127.454	177.911	1.694	2.582	105.026
2012	117.963	1.434	1.495	82.262	117.963	1.434	1.495	82.262
2013	232.672	1.121	1.661	207.634	232.333	1.102	1.638	210.815
2014	130.704	1.290	2.090	101.348	83.519	1.097	1.783	76.126
2015	298.959	1.215	3.960	246.114	236.807	1.037	2.513	228.329
2016	235.751	1.536	2.384	153.517	214.885	1.440	1.961	149.228
2017	159.036	1.488	3.149	106.881	150.449	1.330	2.968	113.113
2018	211.711	1.111	2.292	190.535	210.682	1.094	2.162	192.651
2019	3137.906	5.086	2.181	617.008	621.602	3.194	1.786	194.592
THOUSAND OAKS								
2010	124.263	1.366	1.567	91.002	92.331	0.815	1.435	113.243
2011	146.687	1.145	1.928	128.129	121.175	1.008	1.732	120.168
2012	127.732	1.049	1.196	121.739	118.833	0.991	1.161	119.968
2013	93.860	0.914	1.164	102.735	93.846	0.913	1.154	102.755
2014	104.172	1.102	1.426	94.537	95.331	1.013	1.287	94.150
2015	106.589	0.919	1.893	115.938	103.685	0.889	1.845	116.643
2016	387.439	1.782	2.600	217.455	371.906	1.702	2.392	218.476
2017	309.183	1.874	3.292	165.021	263.840	1.510	2.924	174.779
2018	1364.456	1.981	1.668	688.934	306.864	1.468	1.387	209.037
2019	604.000	2.020	1.239	299.043	199.926	1.479	1.189	135.172
TULARE								
2010	126.684	1.043	1.642	121.481	98.341	0.932	1.503	105.567
2011	83.994	0.743	1.387	113.010	75.838	0.712	1.301	106.565
2012	135.897	1.044	1.455	130.115	123.112	1.005	1.290	122.504
2013	244.439	1.448	1.698	168.757	71.744	0.800	1.548	89.668
2014	137.738	1.164	1.519	118.285	93.658	0.997	1.303	93.949
2015	127.502	1.052	1.414	121.240	99.829	0.908	1.106	109.936
2016	259.232	1.367	1.121	189.694	252.610	1.315	1.099	192.043
2017	310.041	1.581	1.218	196.148	224.100	1.520	1.207	147.467
2018	146.131	0.910	1.111	160.550	141.189	0.878	1.051	160.826
2019	94.032	0.837	1.089	112.347	91.057	0.808	1.049	112.751
VALENCIA								
2010	117.815	0.806	2.195	146.239	103.447	0.698	2.114	148.275
2011	130.855	1.036	1.412	126.276	119.058	0.986	1.379	120.768
2012	62.009	0.462	1.134	134.286	61.595	0.461	1.133	133.738
2013	50.940	0.532	0.683	95.801	50.940	0.532	0.683	95.801
2014	79.216	0.605	0.998	130.876	63.729	0.533	0.935	119.499
2015	72.274	0.611	0.971	118.224	71.053	0.604	0.845	117.624
2016	181.251	1.245	1.552	145.575	173.569	1.123	1.525	154.560
2017	195.045	1.271	1.558	153.426	139.695	0.895	1.292	156.129
2018	170.785	1.307	1.453	130.666	157.708	1.189	1.394	132.628
2019	544.300	1.494	0.968	364.370	188.263	1.183	0.921	159.101

DISTRICT	All Outage				MED Excluded			
	dSAIDI	dSAIFI	dMAIFI	dCAIDI	dSAIDI	dSAIFI	dMAIFI	dCAIDI
VENTURA								
2010	182.739	1.720	2.279	106.240	144.070	1.345	2.103	107.099
2011	167.849	2.247	1.561	74.683	139.680	2.112	1.337	66.150
2012	134.807	1.155	1.507	116.752	128.528	1.140	1.469	112.780
2013	100.521	1.210	1.417	83.104	100.504	1.210	1.417	83.093
2014	183.769	1.648	2.215	111.528	151.635	1.386	2.075	109.381
2015	148.848	1.190	1.447	125.112	141.430	1.149	1.375	123.110
2016	334.355	1.697	1.687	196.992	291.088	1.480	1.561	196.652
2017	704.536	3.609	2.307	195.237	298.397	1.726	1.555	172.839
2018	349.065	1.982	1.938	176.086	313.409	1.721	1.693	182.074
2019	442.937	1.968	2.624	225.109	241.522	1.684	2.422	143.388
VICTORVILLE								
2010	96.446	1.008	2.081	95.727	67.510	0.610	1.368	110.738
2011	196.846	1.008	2.153	195.358	82.406	0.791	1.877	104.144
2012	67.698	0.662	1.775	102.224	57.567	0.584	1.606	98.647
2013	61.333	0.632	1.312	97.109	61.010	0.620	1.179	98.380
2014	68.830	0.633	0.896	108.709	67.680	0.620	0.877	109.146
2015	87.026	0.906	1.839	96.063	72.897	0.812	1.551	89.751
2016	143.745	1.102	1.397	130.401	140.336	1.073	1.328	130.835
2017	178.268	1.159	2.360	153.853	167.325	1.072	1.764	156.104
2018	185.541	1.098	1.347	168.956	157.487	1.037	1.272	151.797
2019	116.599	1.248	2.010	93.450	108.852	1.131	1.670	96.255
WHITTIER								
2010	101.330	0.696	1.127	145.626	74.586	0.572	1.023	130.480
2011	99.736	0.749	1.187	133.093	91.881	0.724	1.122	126.855
2012	72.597	0.742	1.383	97.877	72.304	0.719	1.312	100.597
2013	135.043	0.859	1.055	157.172	135.043	0.859	1.055	157.172
2014	87.600	0.704	1.155	124.399	84.188	0.689	1.090	122.157
2015	114.520	0.733	1.084	156.317	104.851	0.704	0.989	148.883
2016	296.179	1.143	1.420	259.097	249.056	0.946	1.294	263.363
2017	315.766	1.220	1.879	258.770	258.768	1.074	1.662	240.925
2018	152.992	0.834	1.415	183.422	138.909	0.744	1.300	186.710
2019	168.769	0.885	1.379	190.610	157.902	0.780	1.160	202.554
WILDOMAR								
2010	127.124	1.122	1.565	113.258	79.888	0.881	1.172	90.656
2011	109.406	1.219	1.225	89.739	108.810	1.210	1.197	89.923
2012	88.539	0.725	0.805	122.193	87.186	0.690	0.756	126.346
2013	40.512	0.555	0.656	72.932	40.122	0.554	0.656	72.407
2014	118.493	0.806	0.743	147.031	112.300	0.772	0.683	145.548
2015	52.699	0.597	1.255	88.256	48.313	0.566	1.054	85.401
2016	145.671	1.092	0.954	133.411	140.811	1.065	0.865	132.249
2017	160.508	1.031	1.016	155.709	126.730	0.811	0.934	156.273
2018	105.497	0.936	0.848	112.657	96.615	0.812	0.762	119.004
2019	142.416	0.967	0.742	147.330	101.078	0.808	0.730	125.060
YUCCA VALLEY								
2010	307.670	3.017	5.167	101.994	235.893	2.370	4.016	99.547
2011	436.441	2.163	6.922	201.767	354.867	1.966	5.598	180.481
2012	319.821	3.413	7.170	93.708	250.377	2.806	5.467	89.239
2013	216.972	1.500	4.983	144.620	216.966	1.500	4.983	144.626
2014	304.182	1.490	4.856	204.146	293.662	1.407	4.851	208.750
2015	389.085	1.804	3.922	215.688	260.176	1.189	2.708	218.766
2016	694.456	3.917	3.894	177.297	670.831	3.780	3.125	177.445
2017	411.497	2.306	1.609	178.470	381.275	2.077	1.516	183.553
2018	376.985	2.036	2.757	185.130	229.733	1.587	1.842	144.746
2019	517.135	2.537	1.941	203.824	466.994	2.263	1.738	206.382

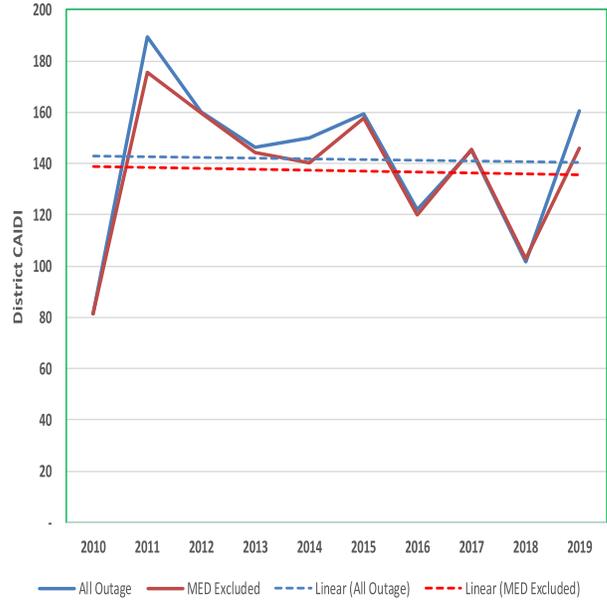
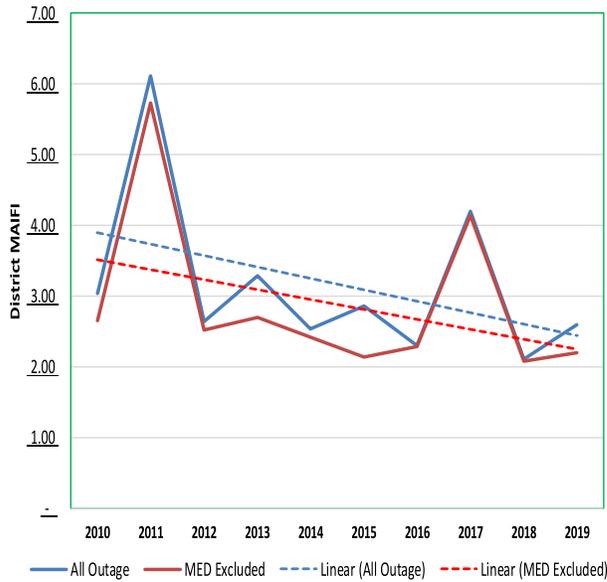
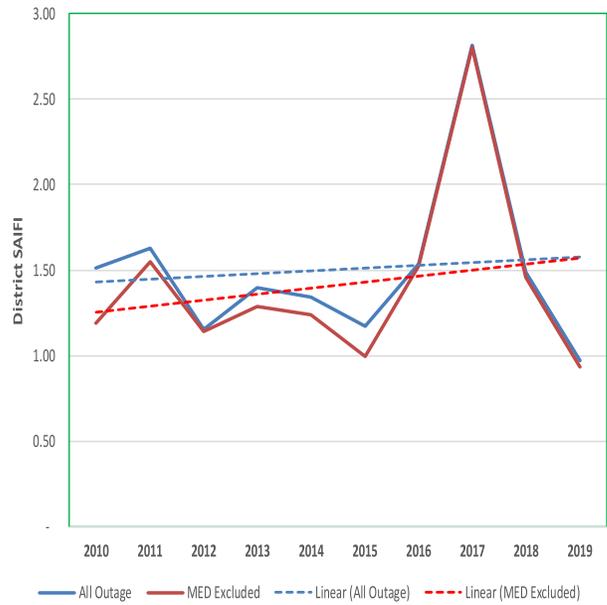
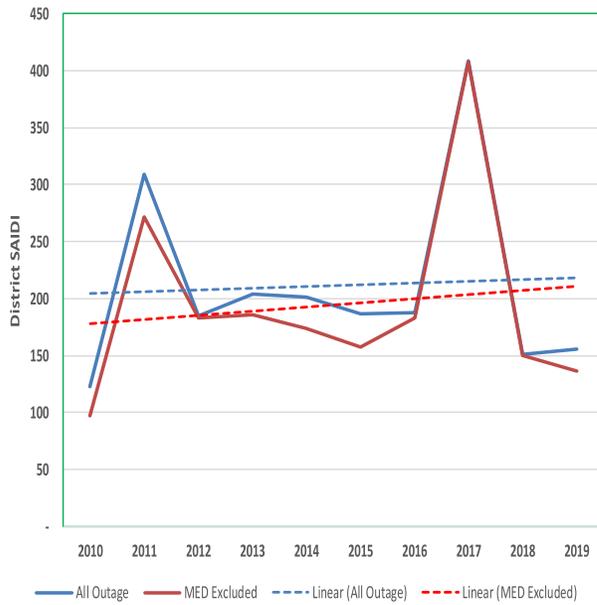
- a. The linear charts below show the past 10 years District Reliability Performance from 2010–2019 of dSAIDI, dSAIFI, dMAIFI and dCAIDI for all 34 districts. There are separate charts including and excluding MED. The charts shown are listed in alphabetical order by the district name.



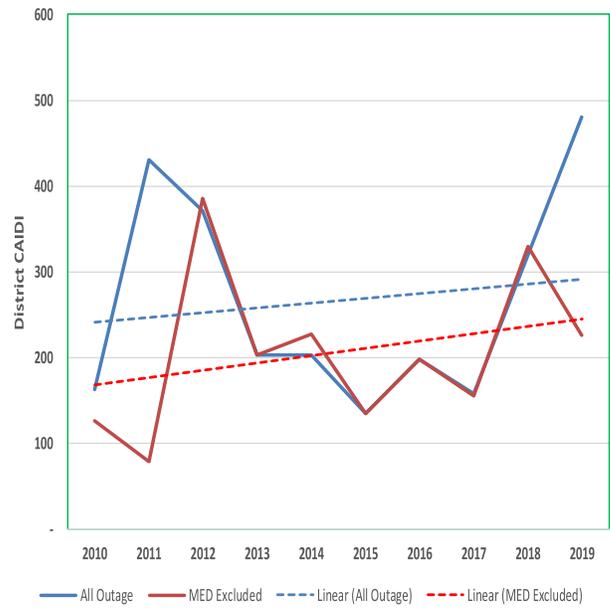
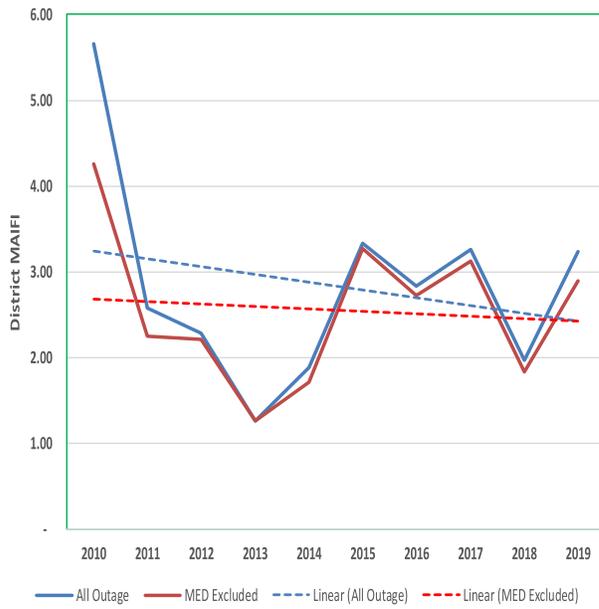
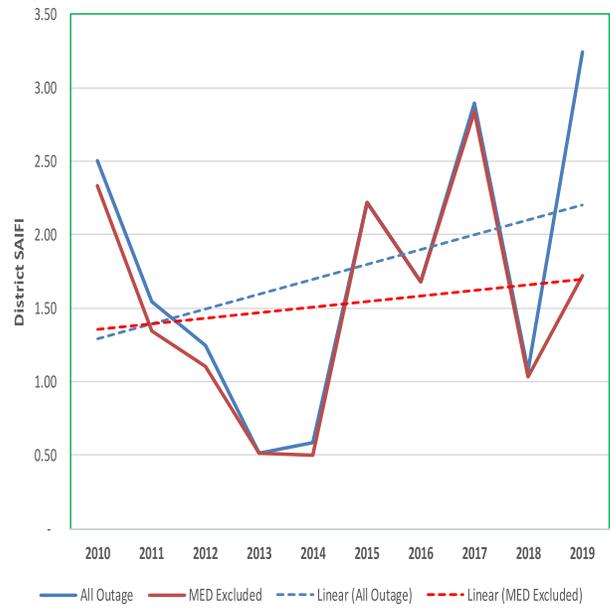
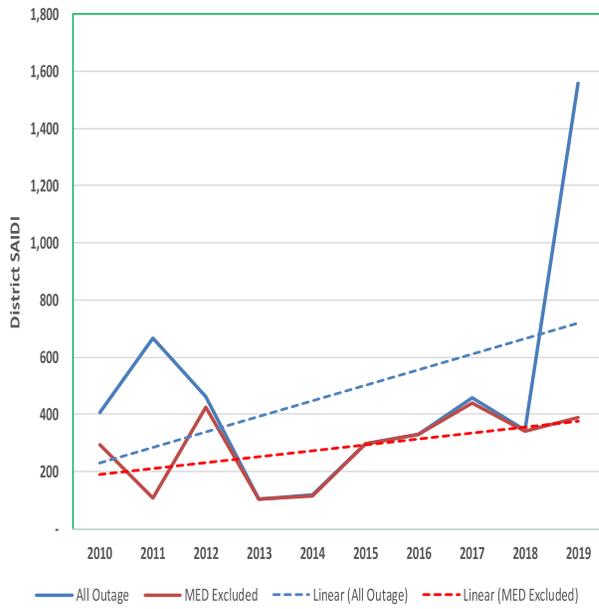
ARROWHEAD District Reliability Performance



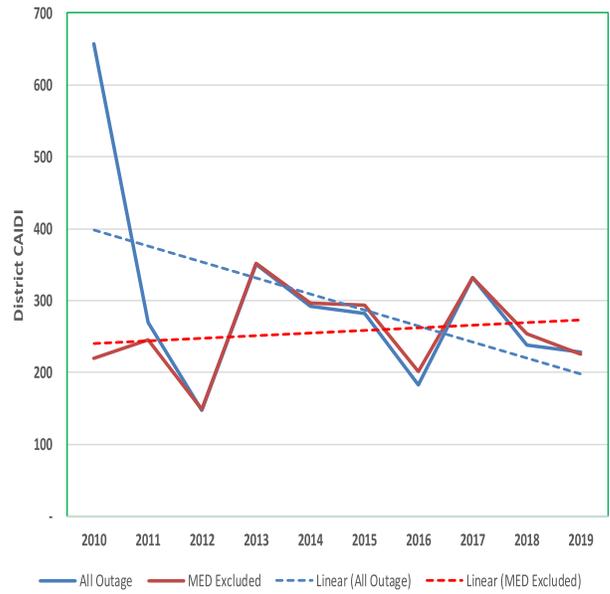
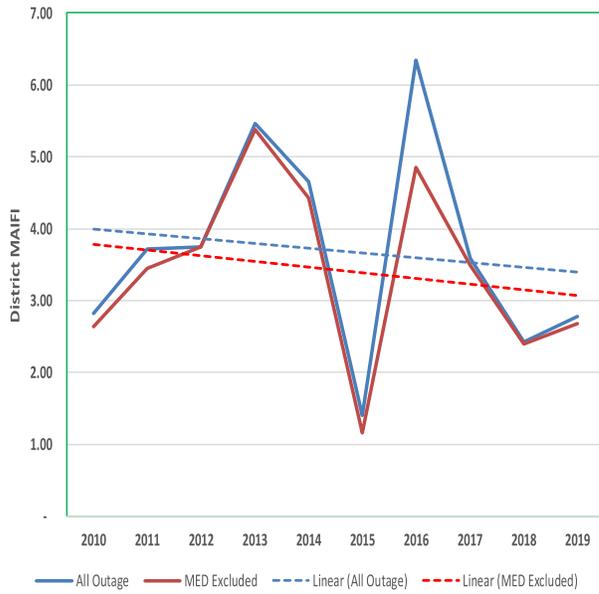
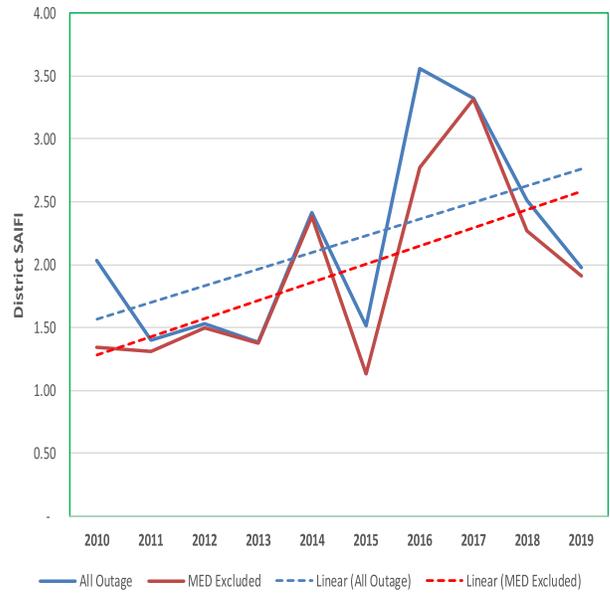
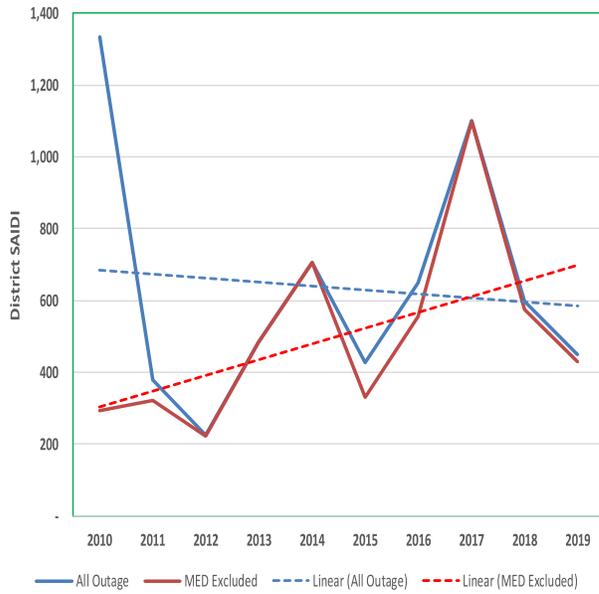
BARSTOW District Reliability Performance



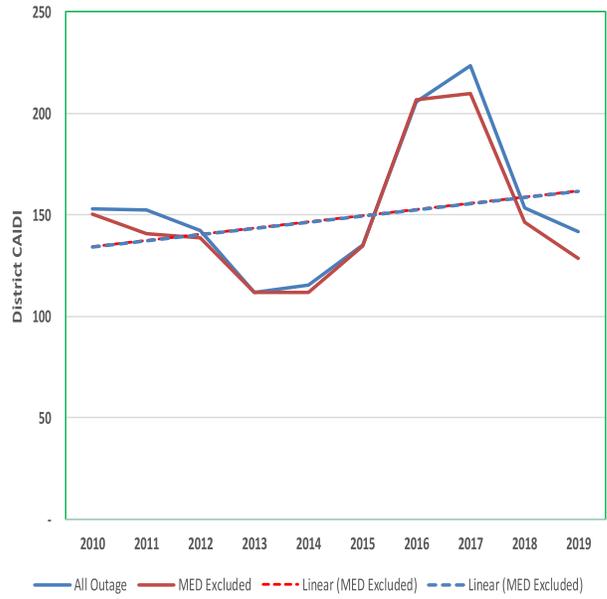
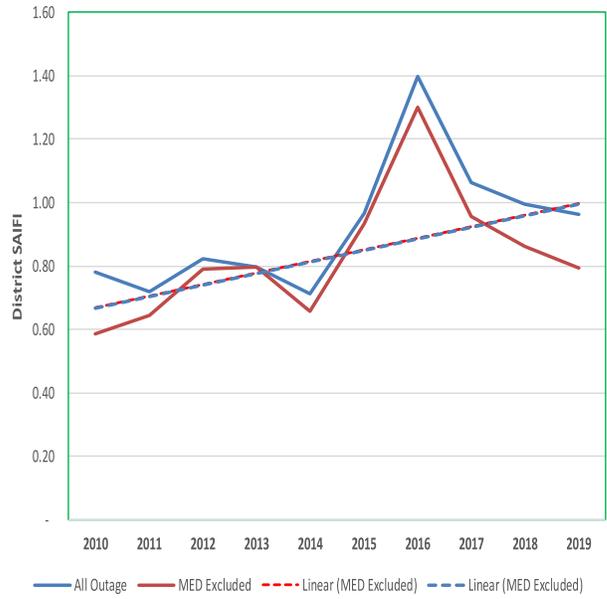
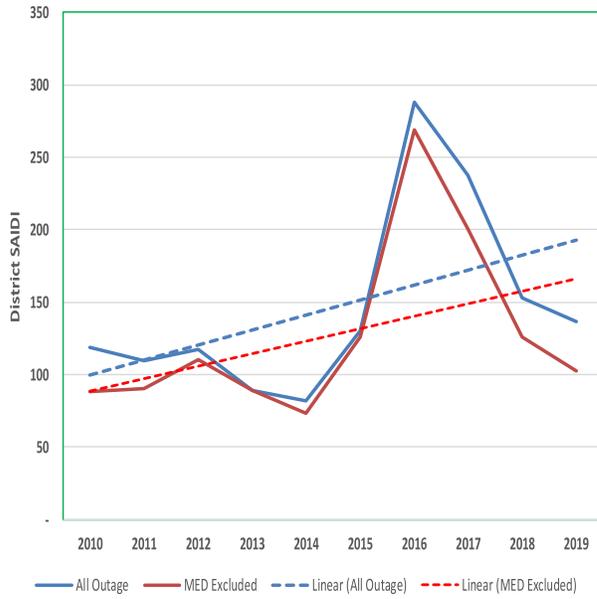
BISHOP District Reliability Performance



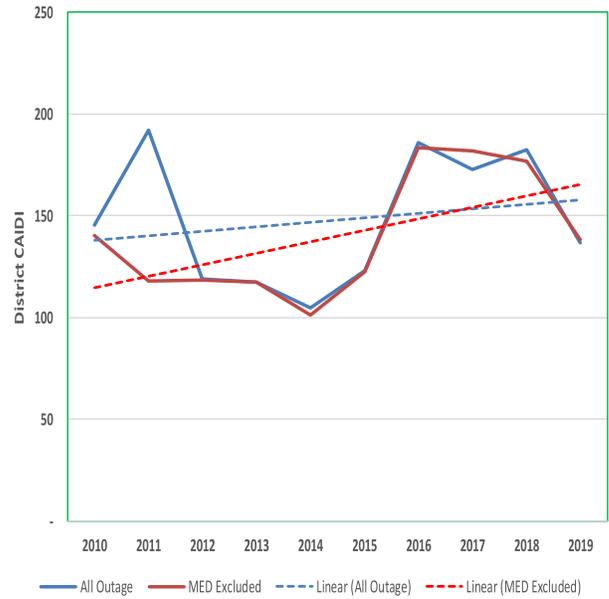
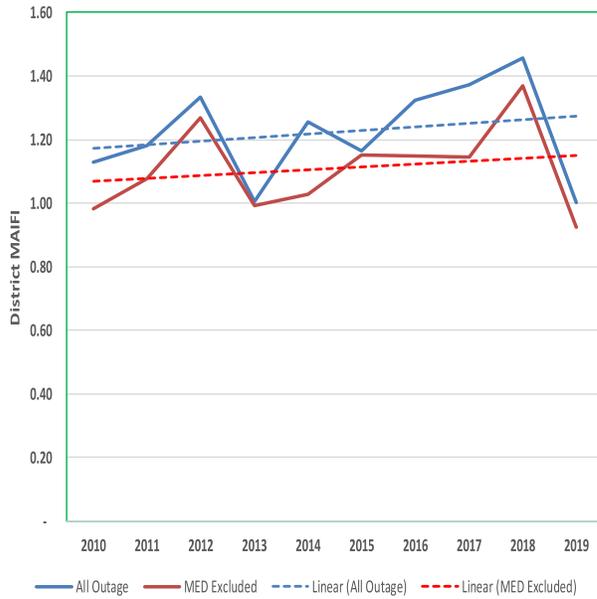
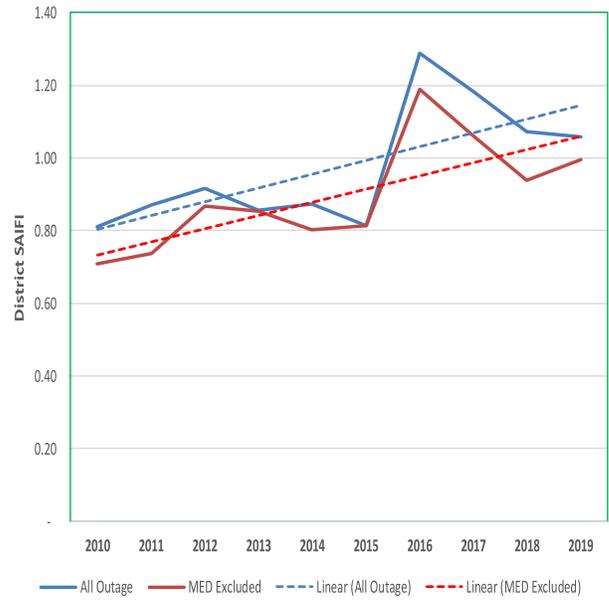
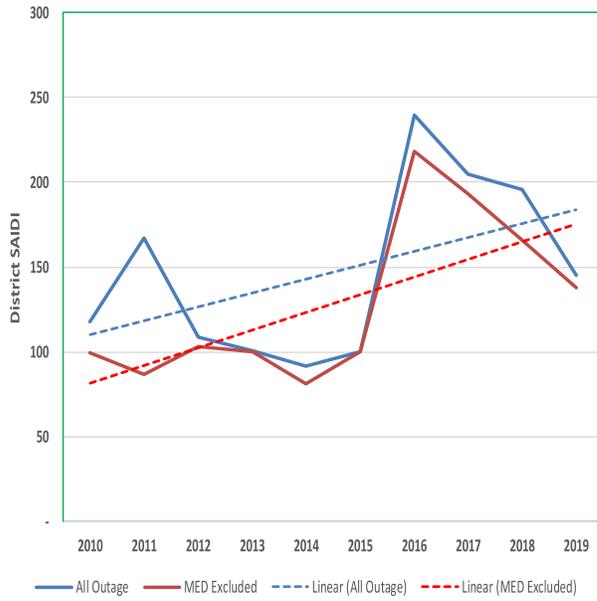
BLYTHE District Reliability Performance



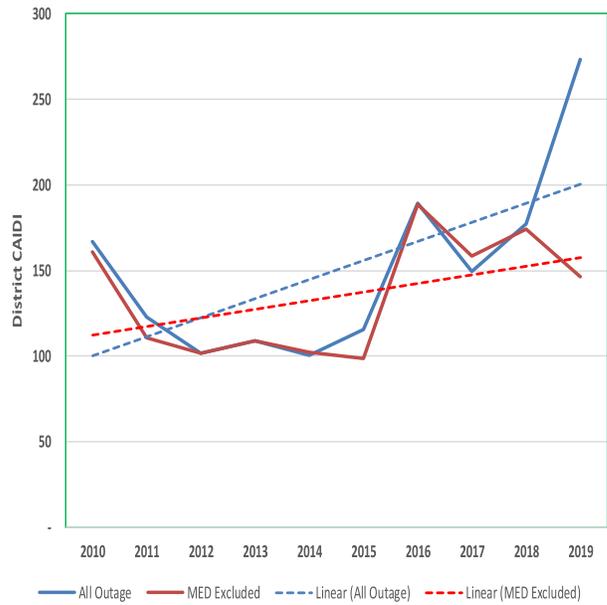
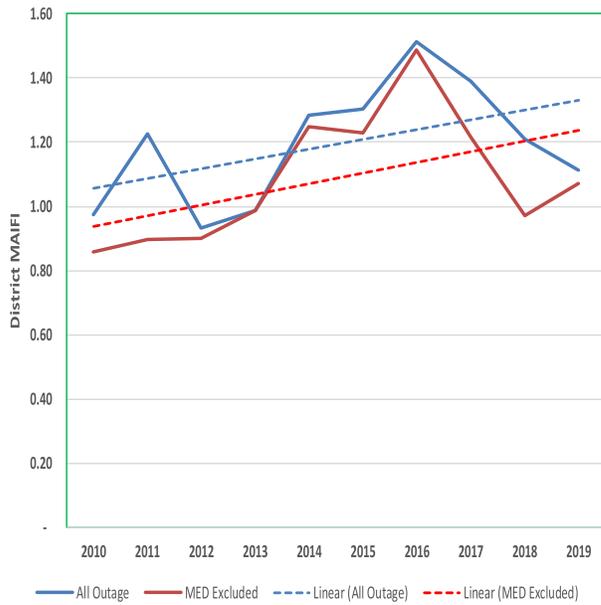
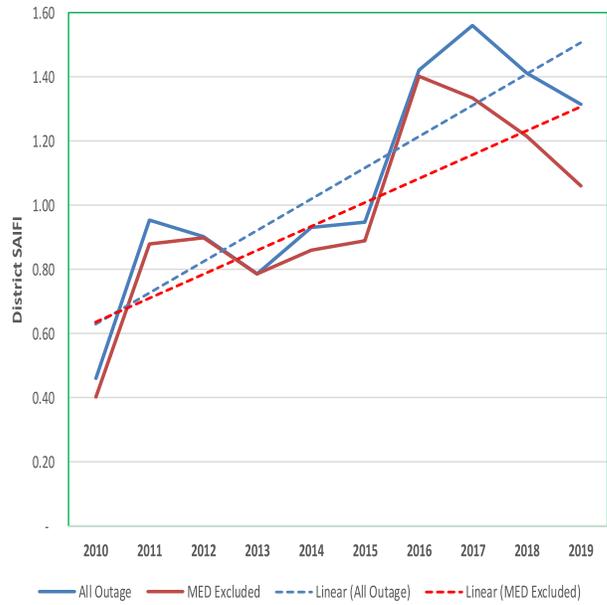
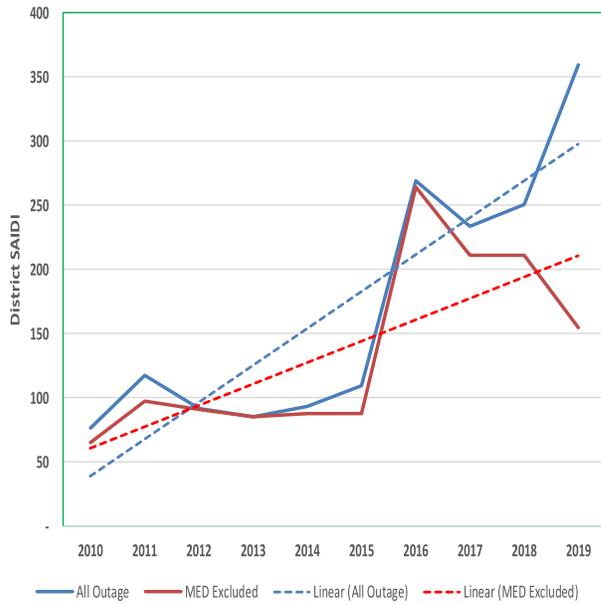
COMPTON District Reliability Performance



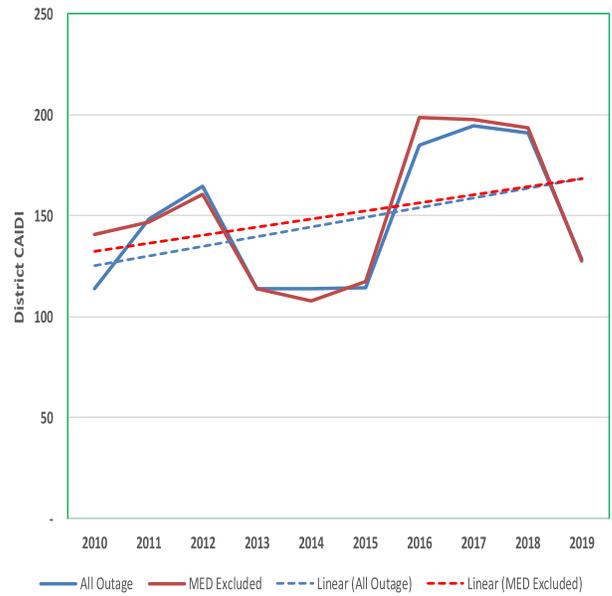
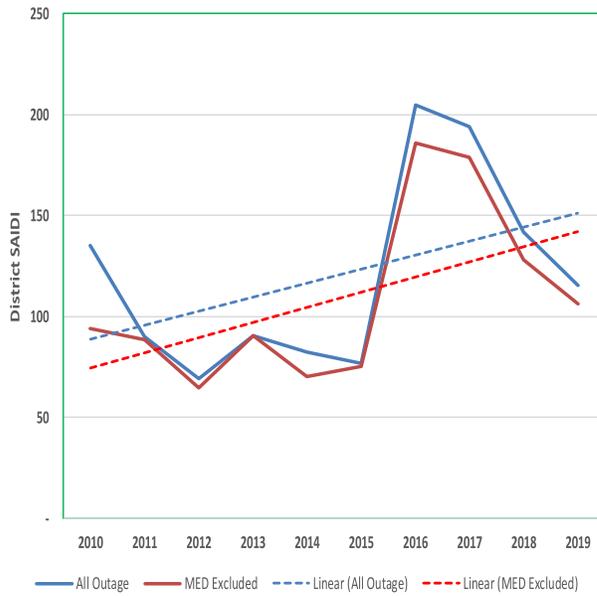
COVINA District Reliability Performance



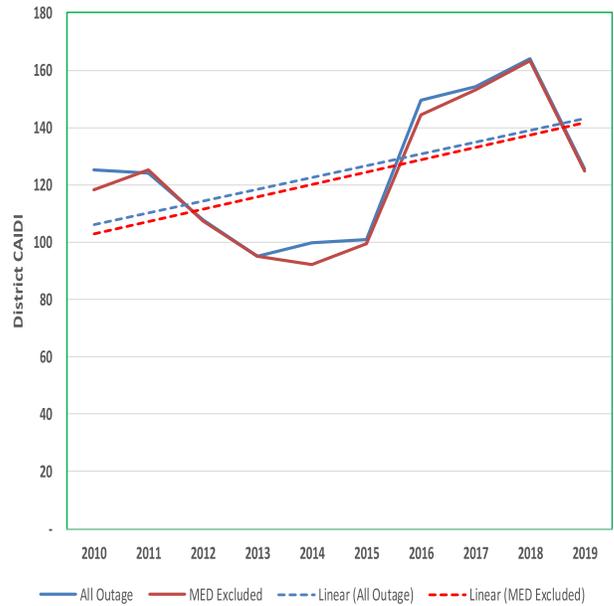
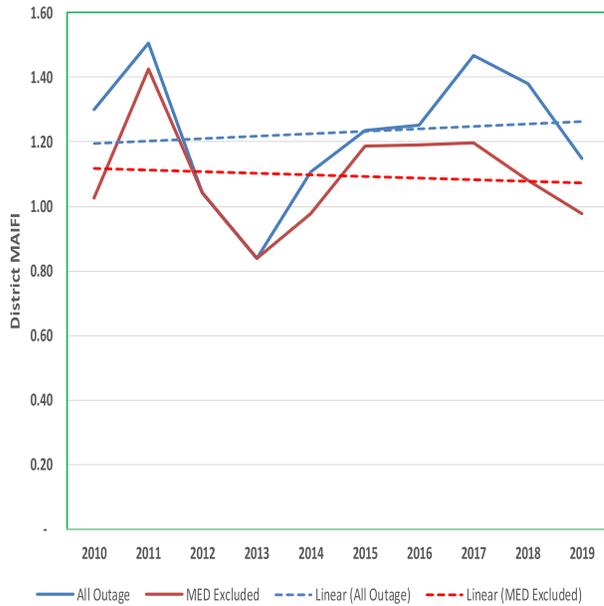
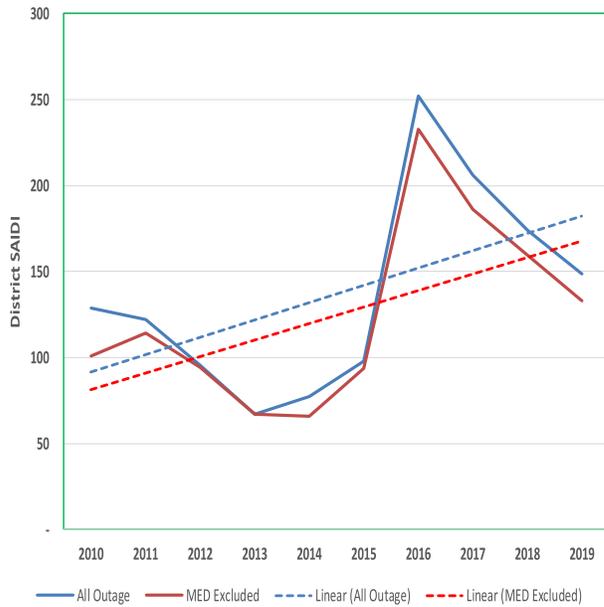
FOOTHILL District Reliability Performance



FULLERTON District Reliability Performance

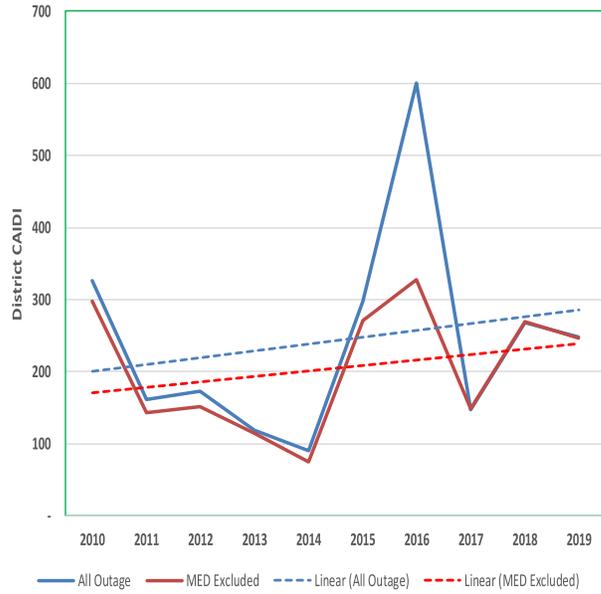
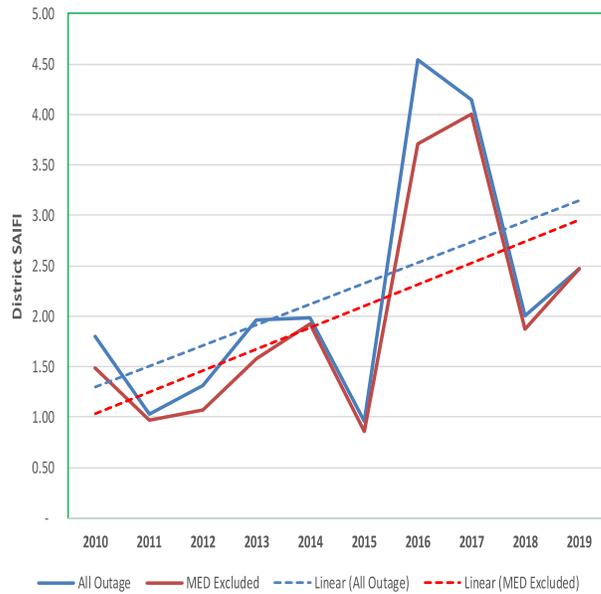
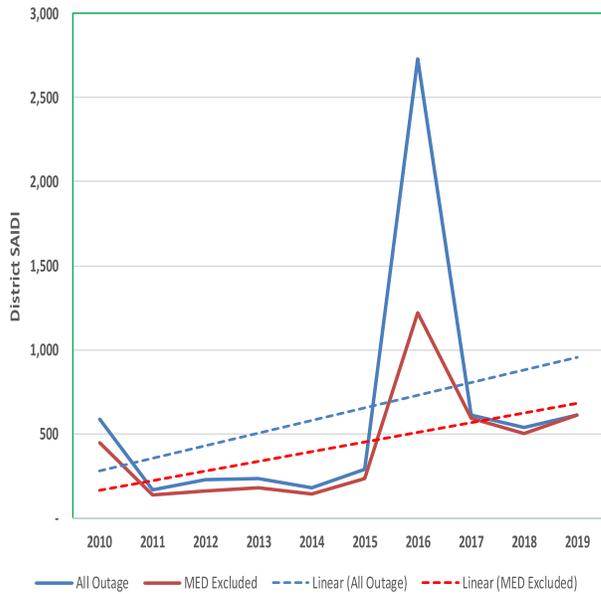


HUNTINGTON BEACH District Reliability Performance¹²

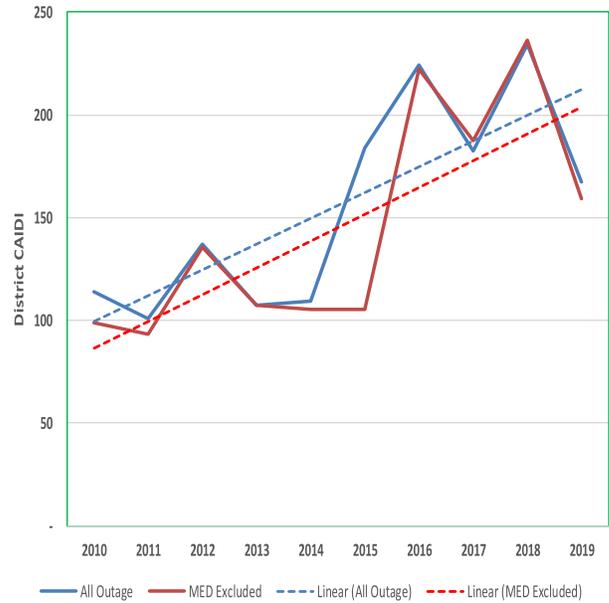
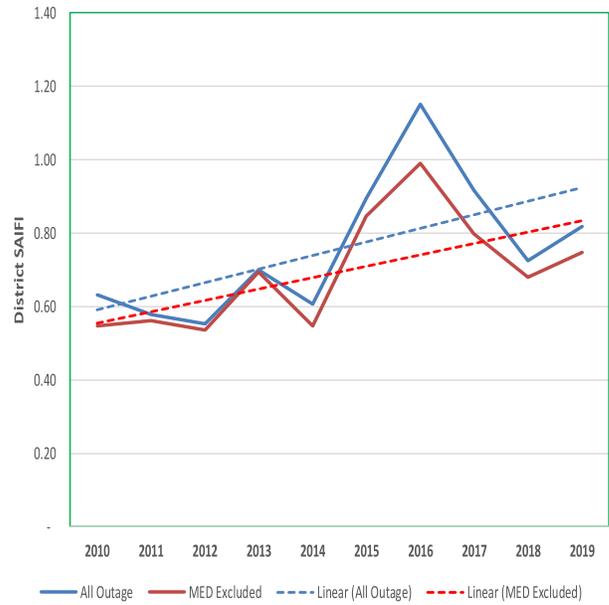
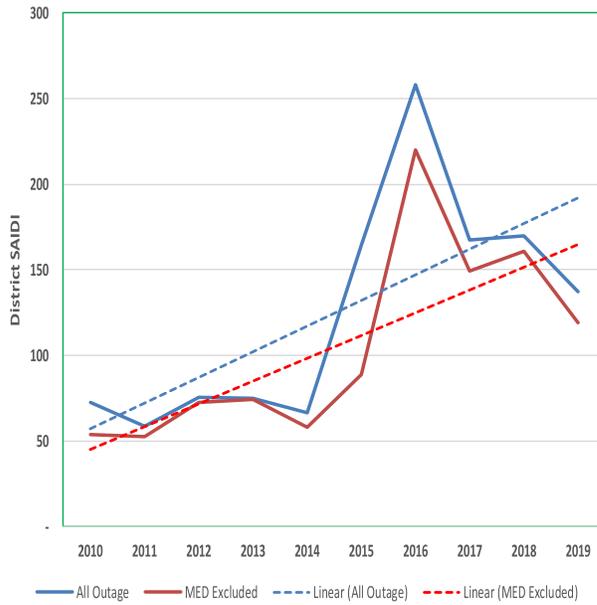


¹² For 2010 - 2019, Catalina District charts have been combined with Huntington Beach District since the Catalina District operations have been combined with the Huntington Beach District.

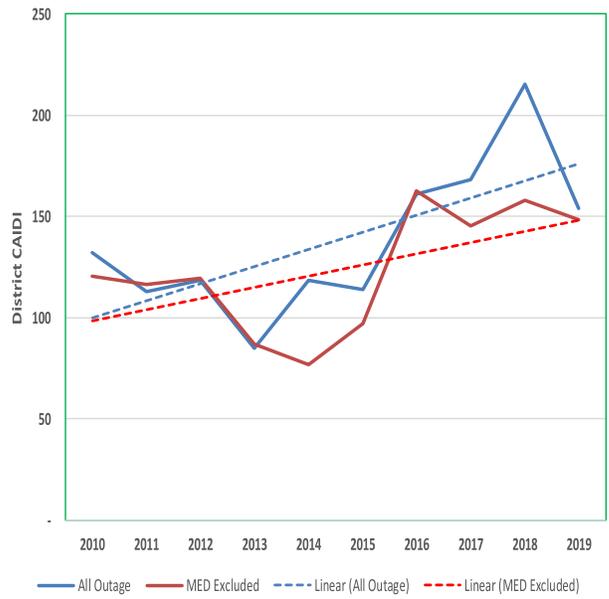
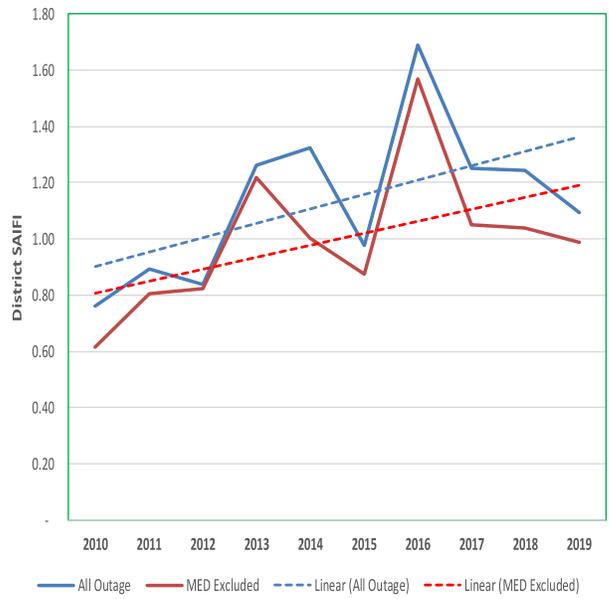
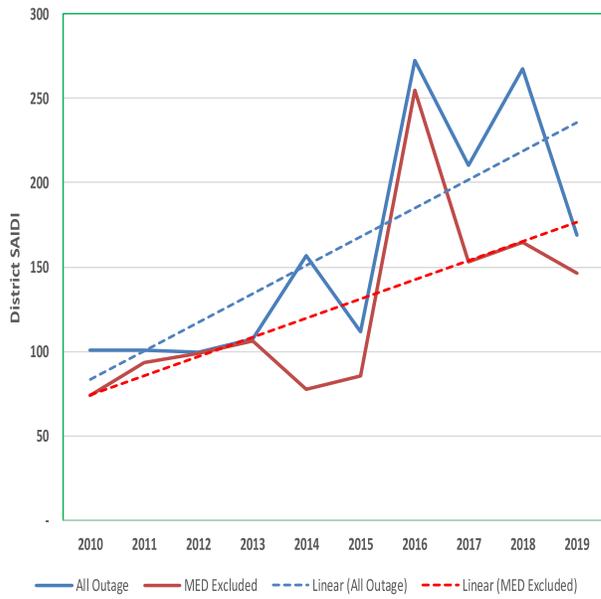
KERNVILLE District Reliability Performance



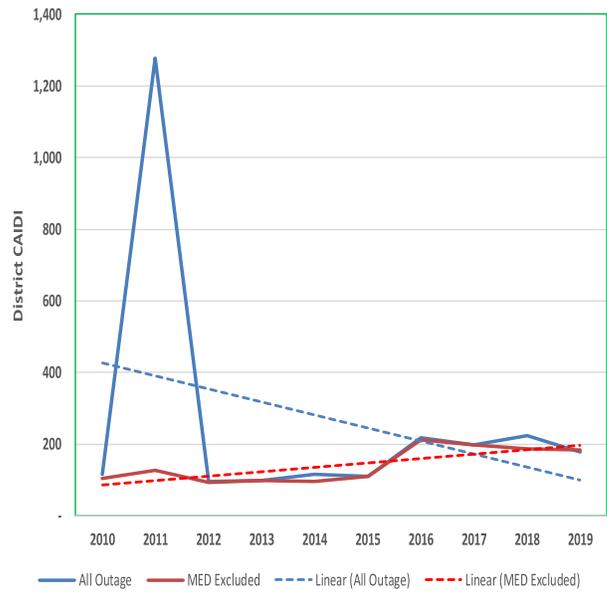
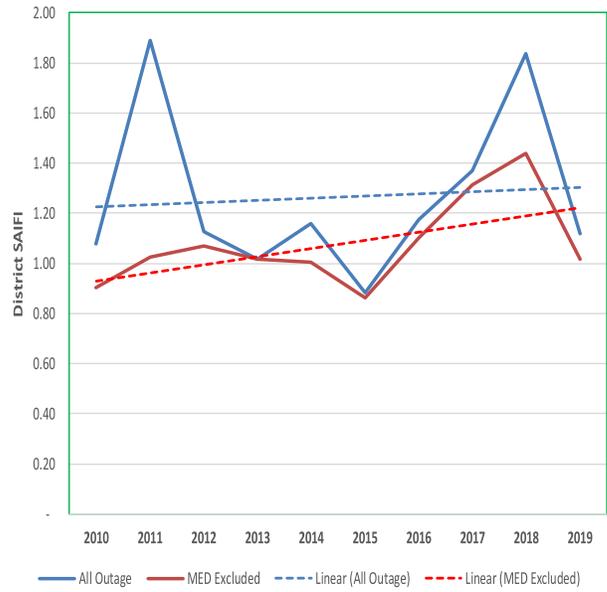
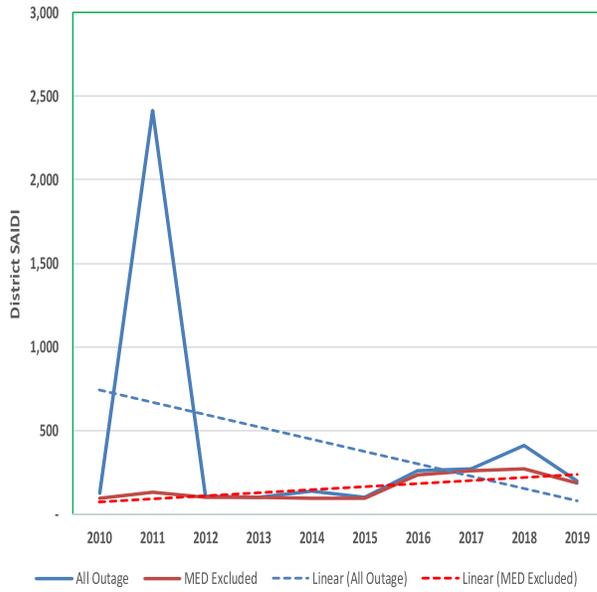
LONG BEACH District Reliability Performance



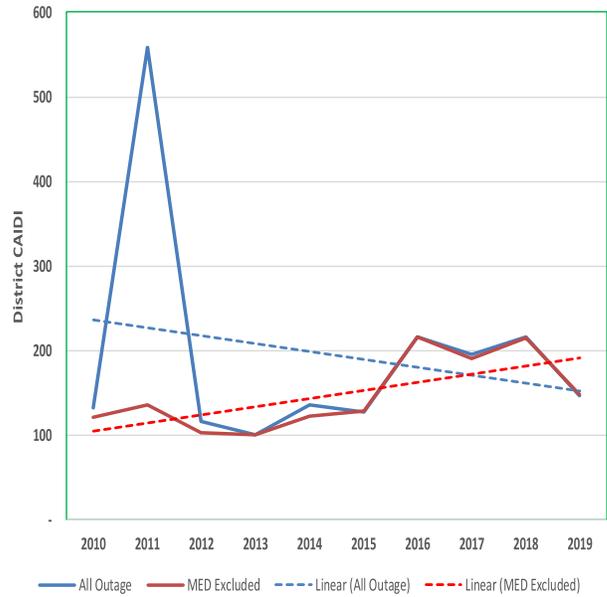
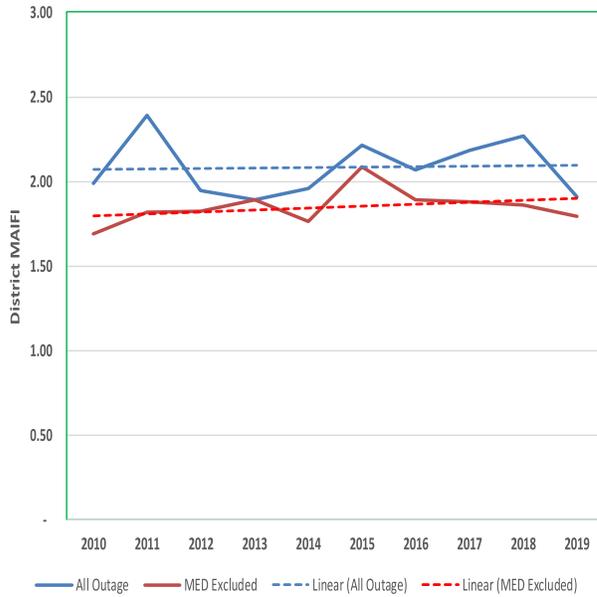
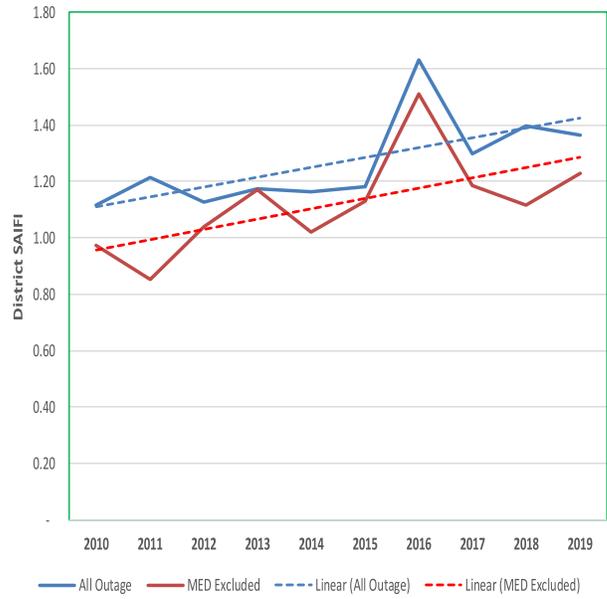
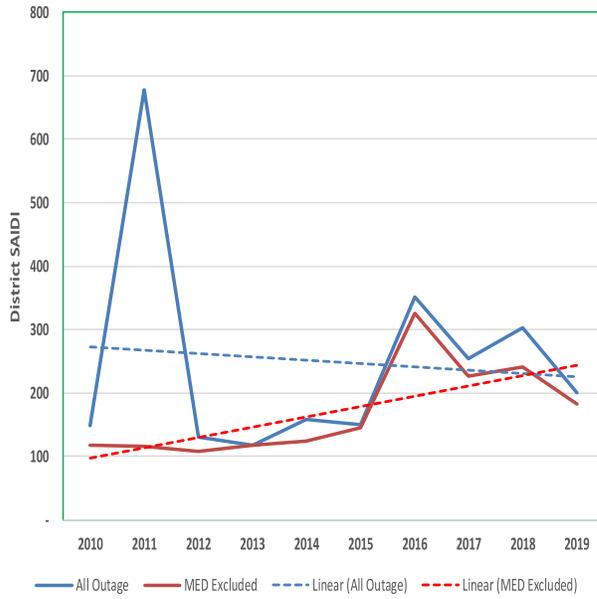
MENIFEE District Reliability Performance



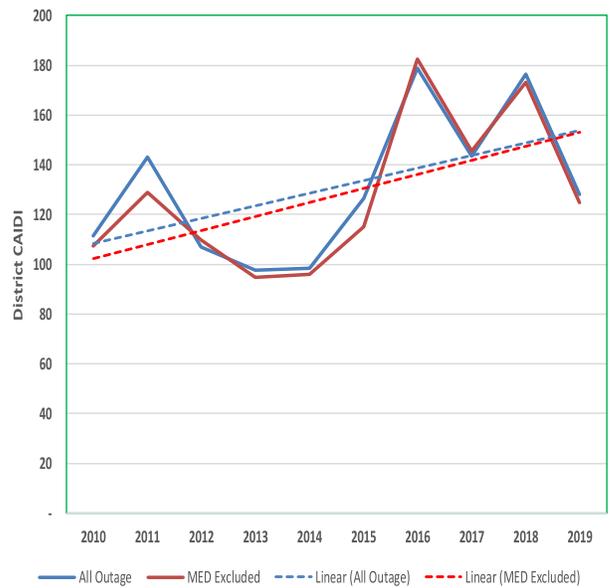
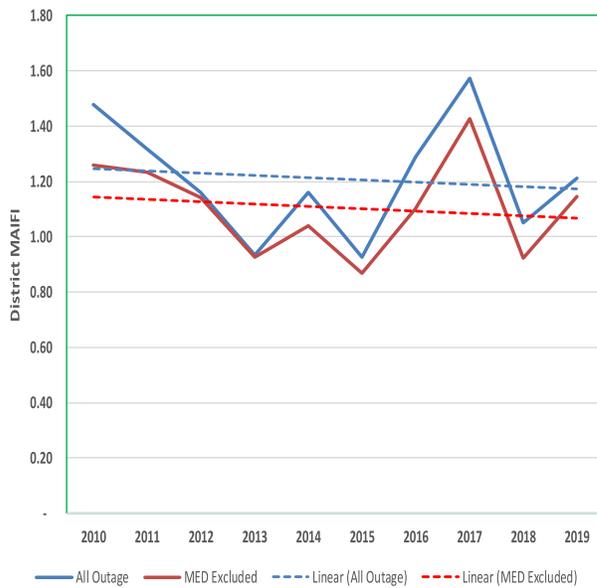
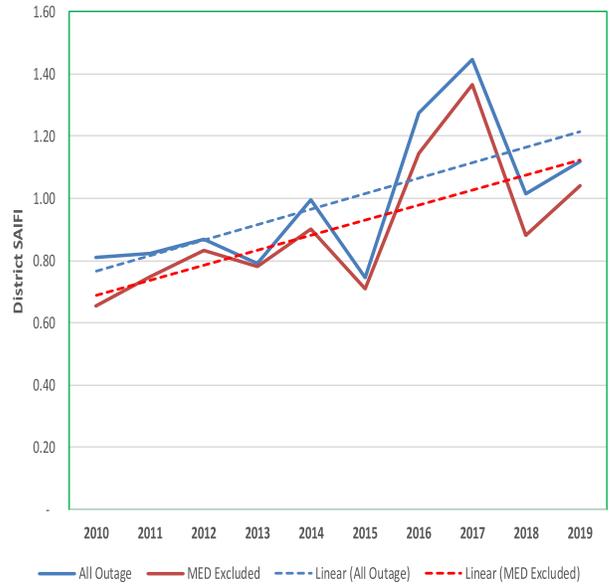
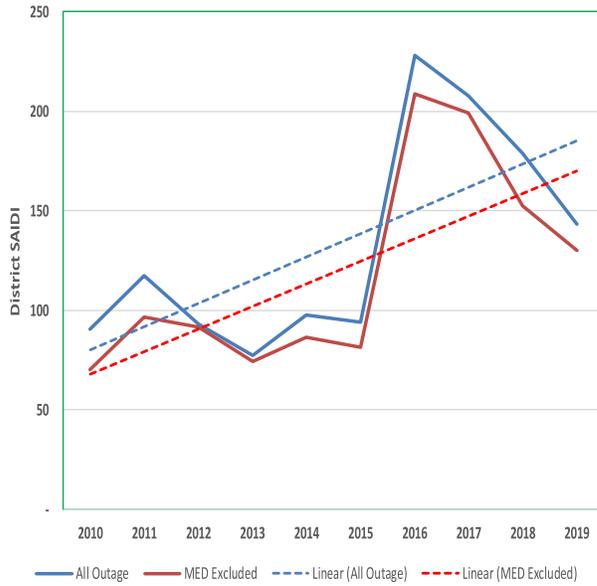
MONROVIA District Reliability Performance



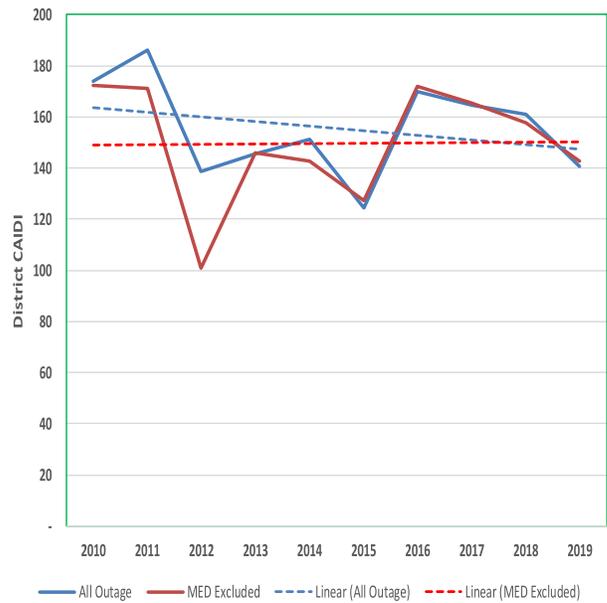
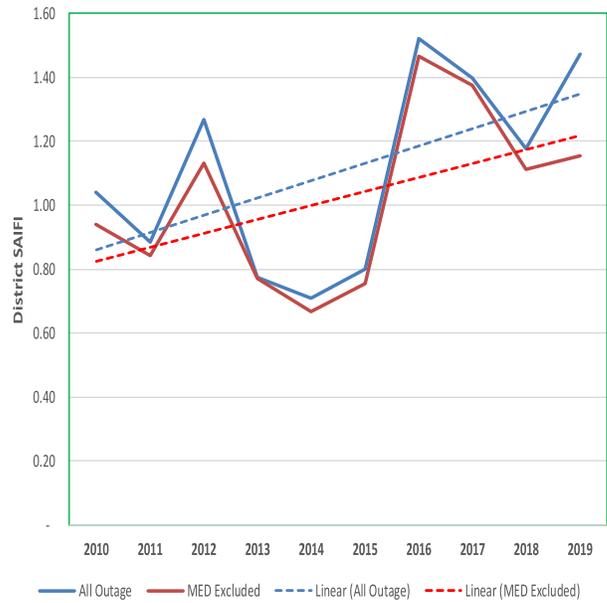
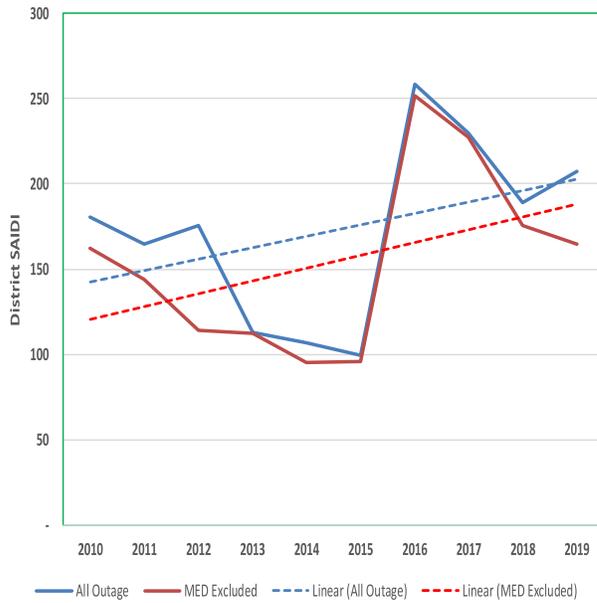
MONTEBELLO District Reliability Performance



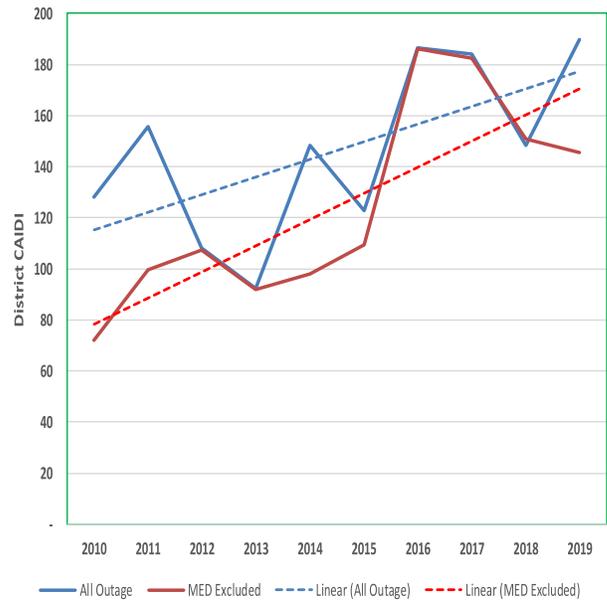
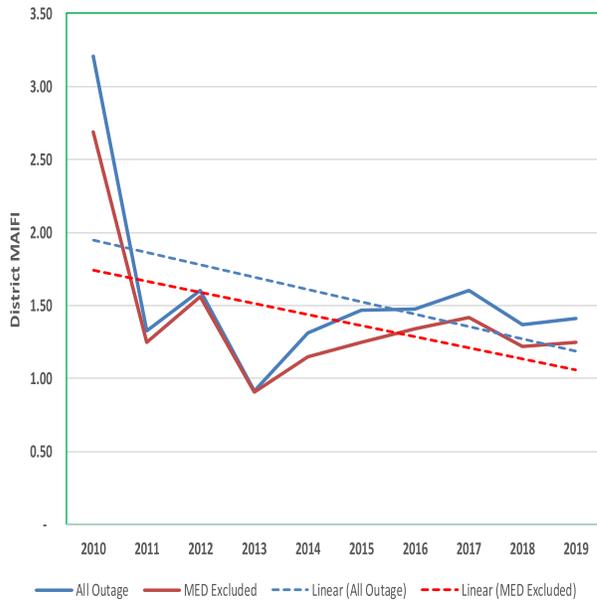
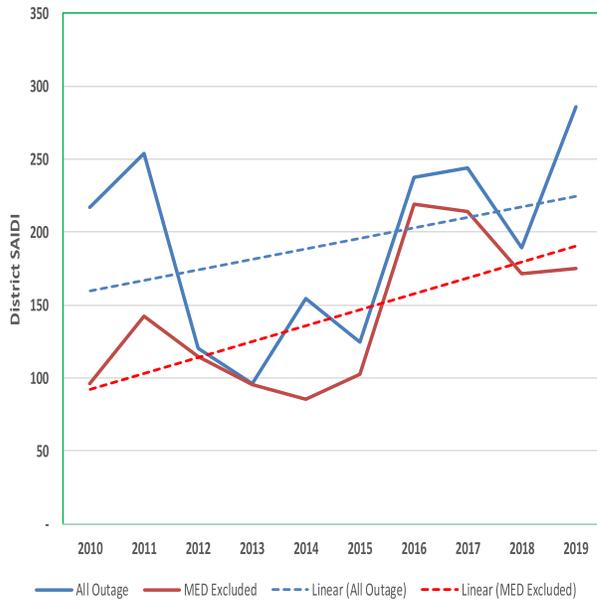
ONTARIO District Reliability Performance



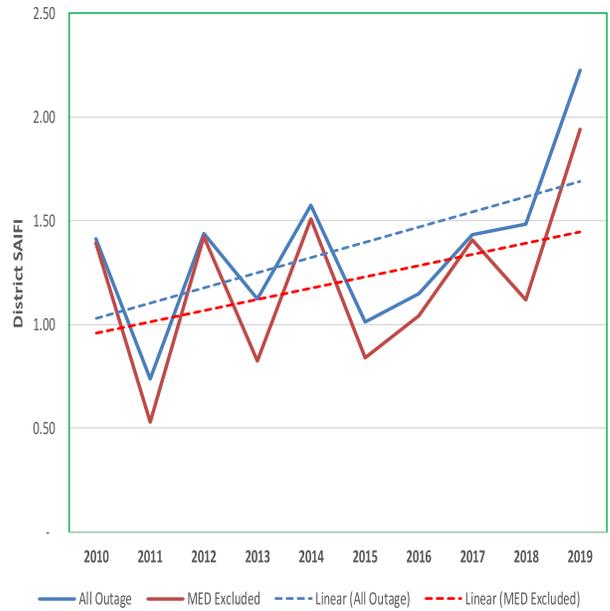
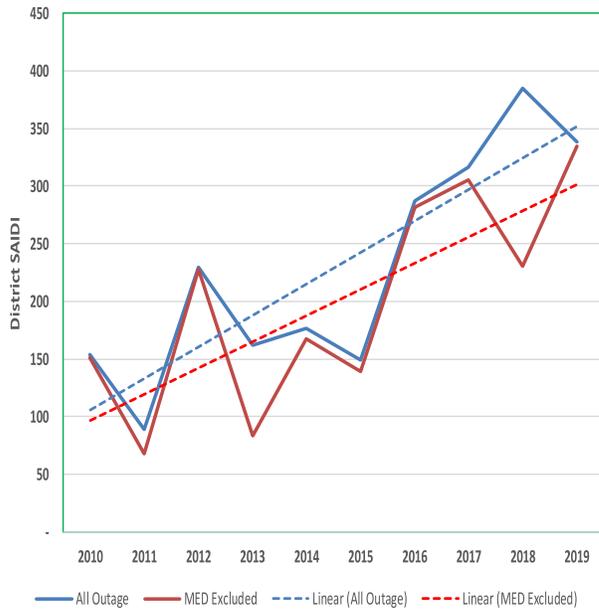
PALM SPRINGS District Reliability Performance



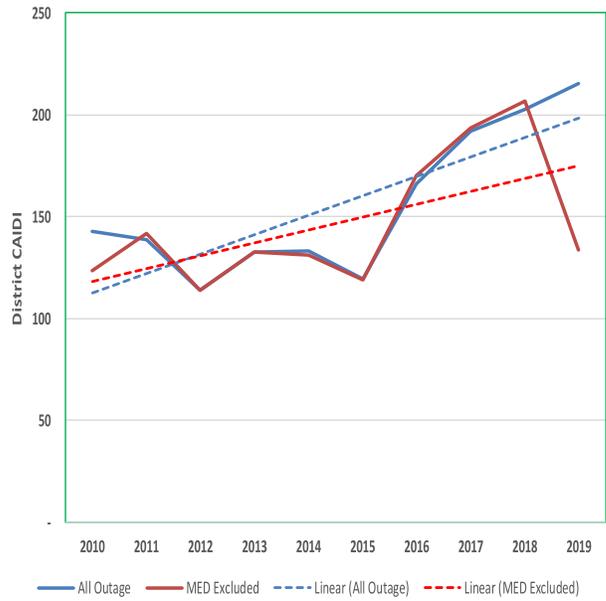
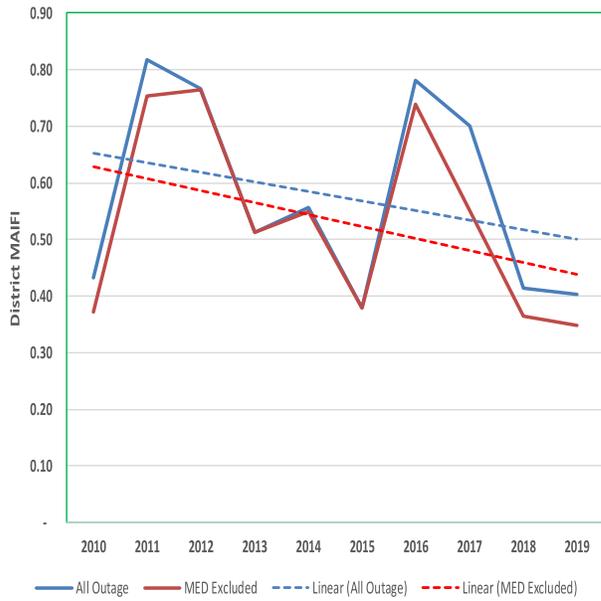
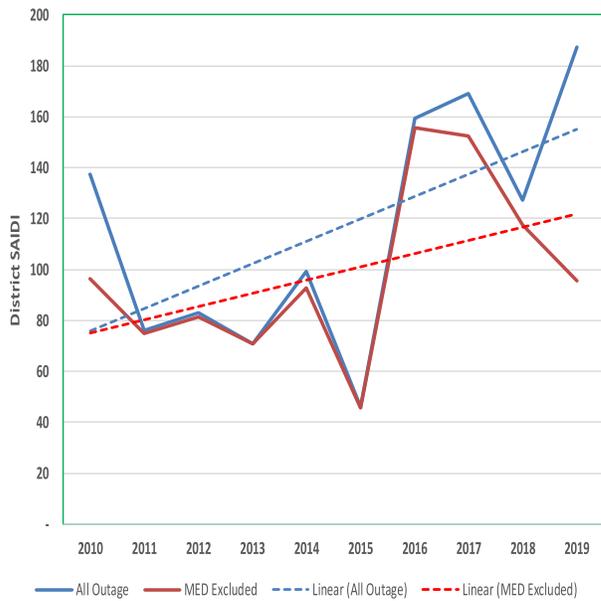
REDLANDS District Reliability Performance



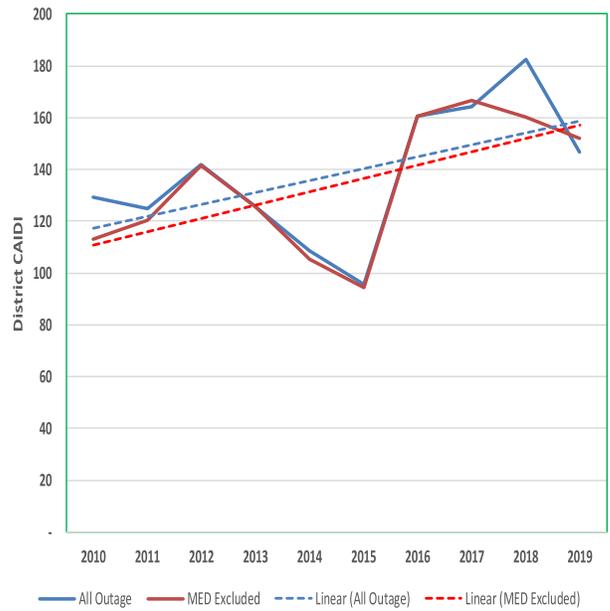
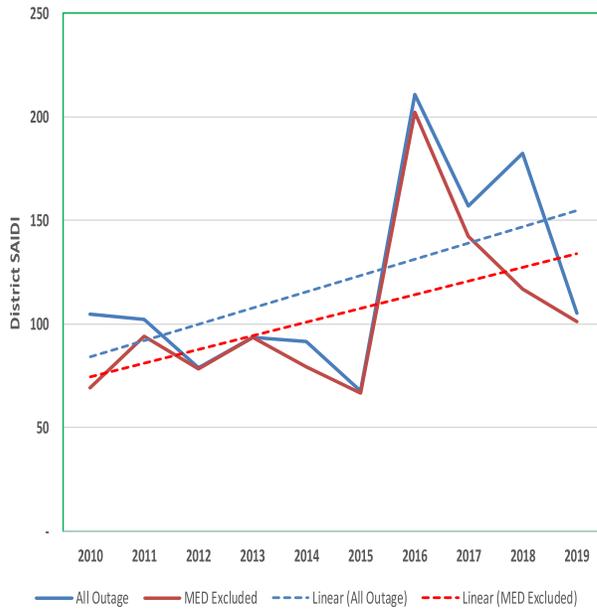
RIDGECREST District Reliability Performance



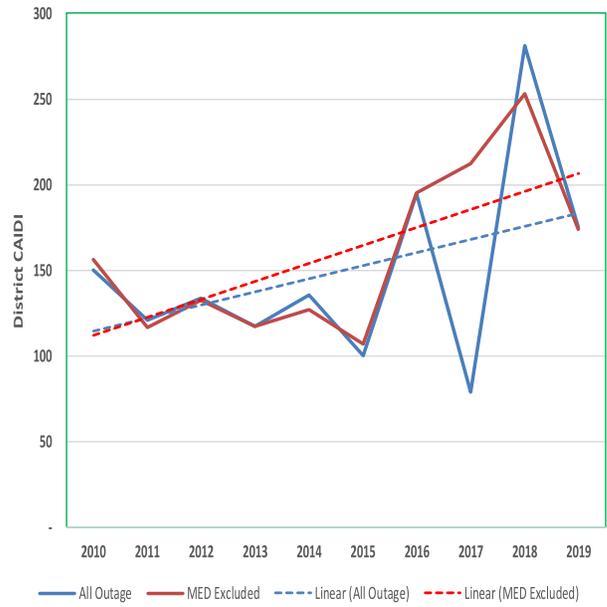
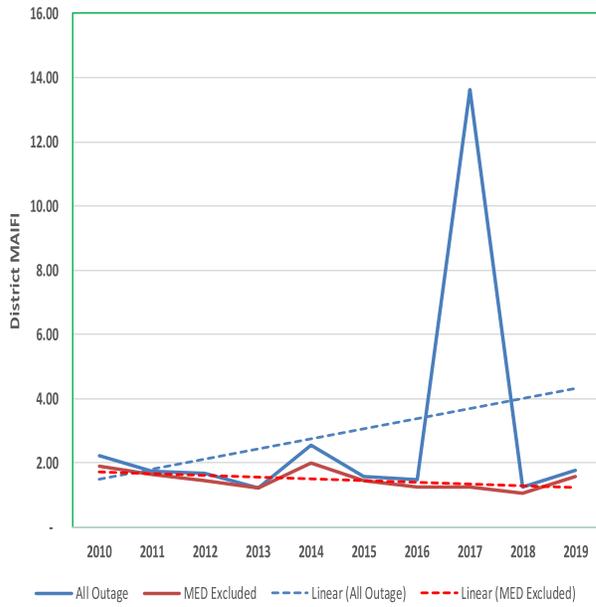
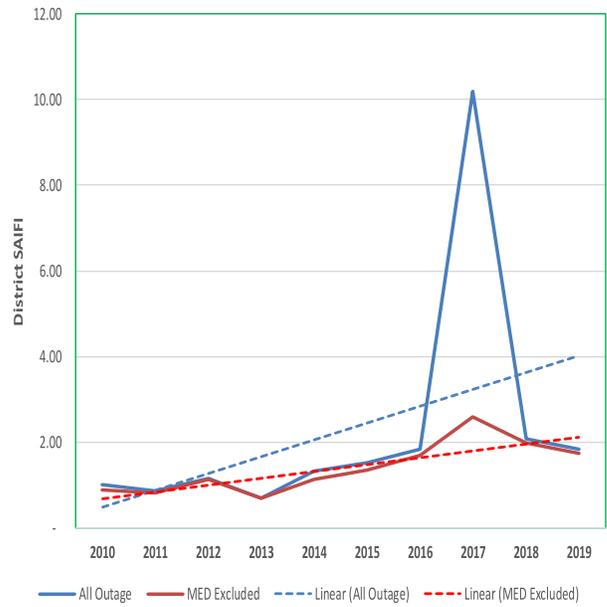
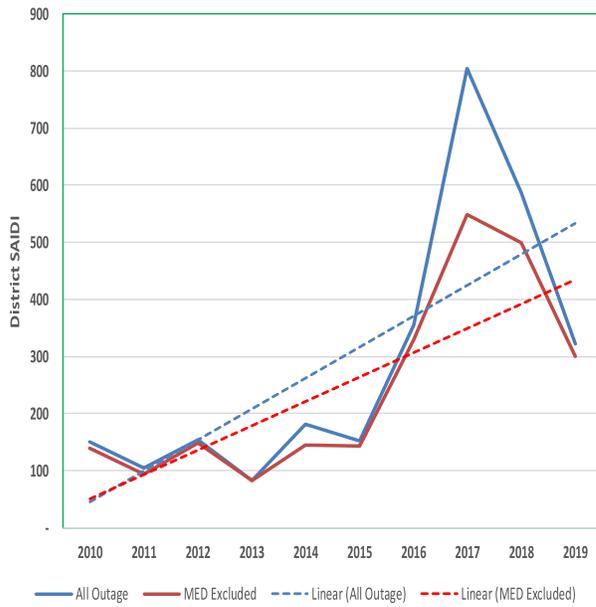
SADDLEBACK District Reliability Performance



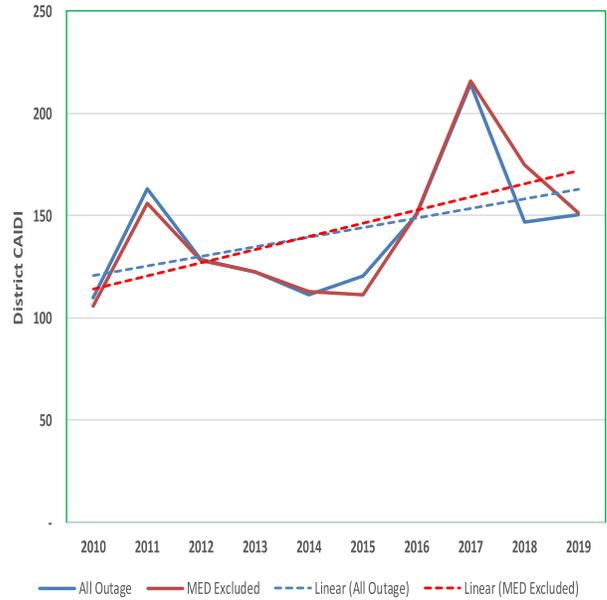
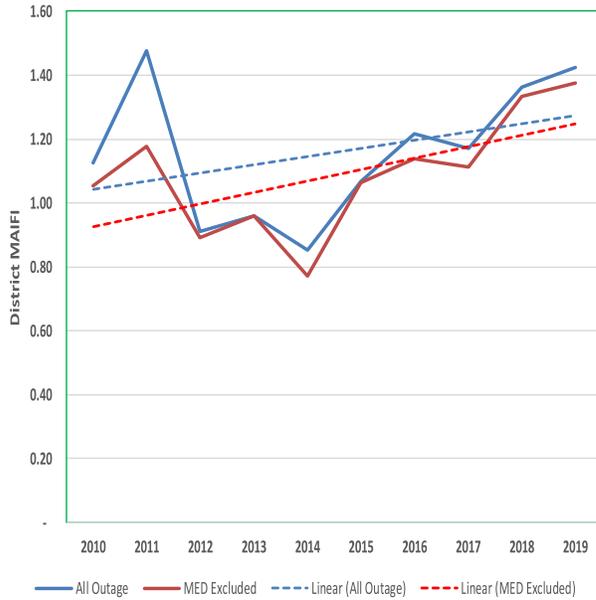
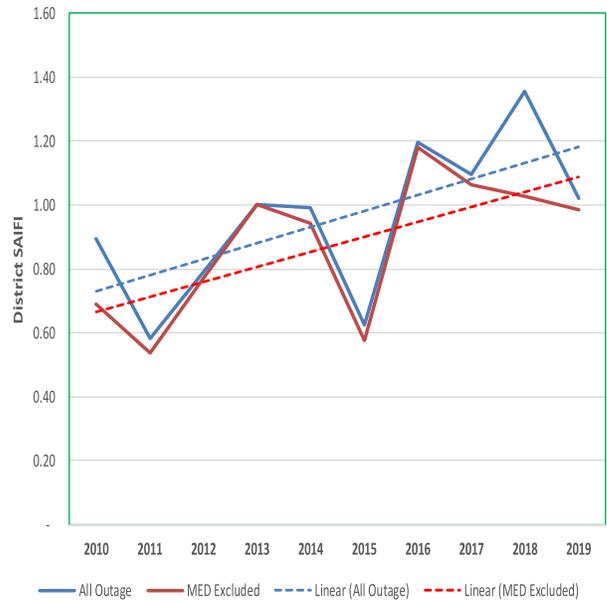
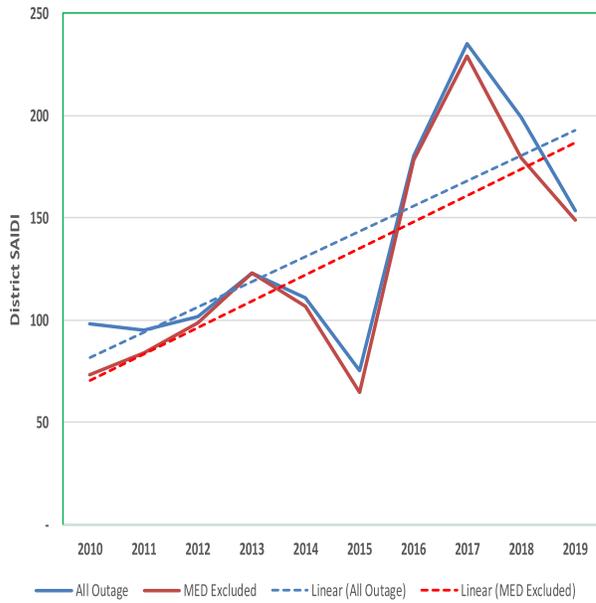
SANTA ANA District Reliability Performance



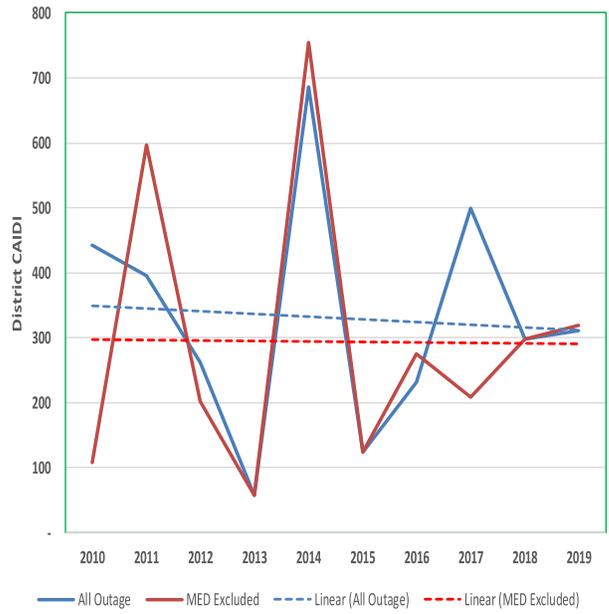
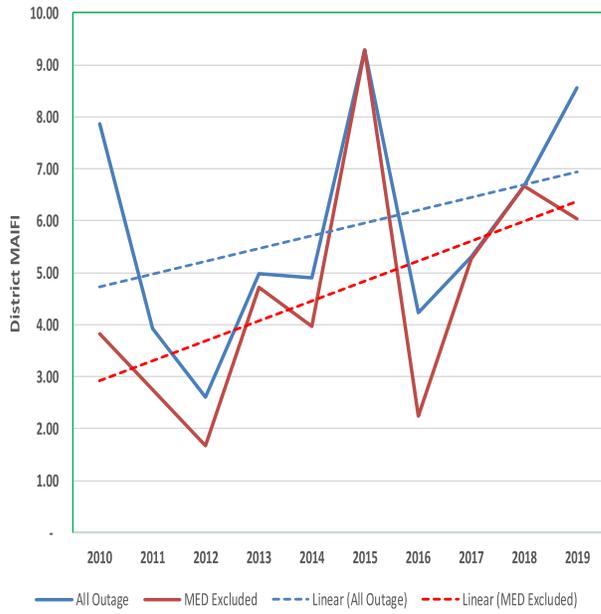
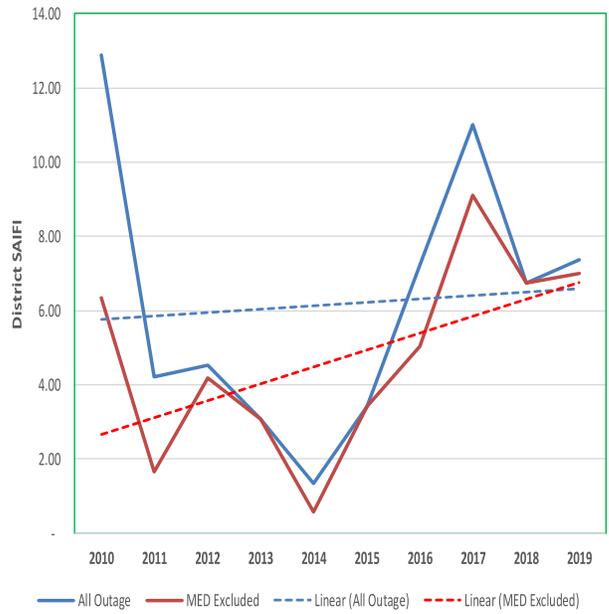
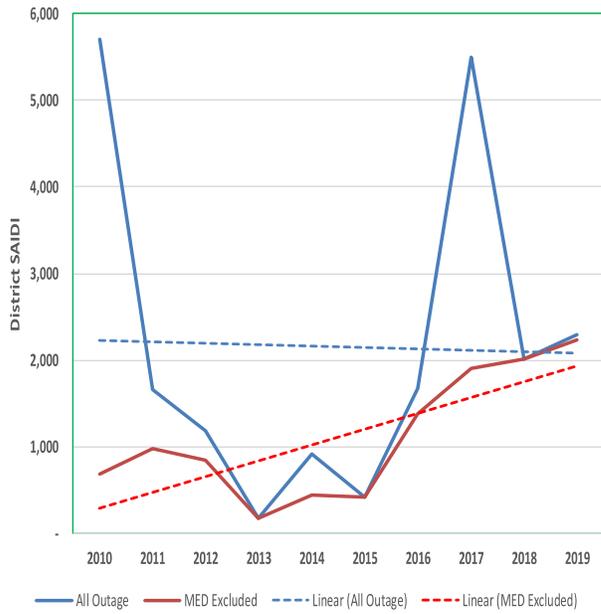
SANTA BARBARA District Reliability Performance



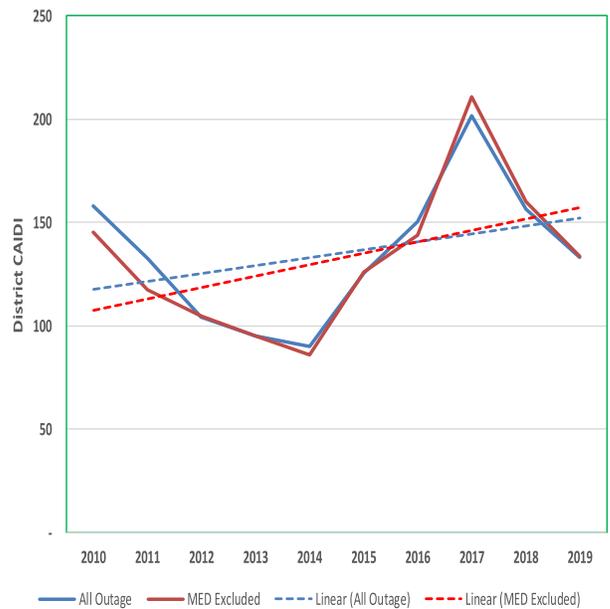
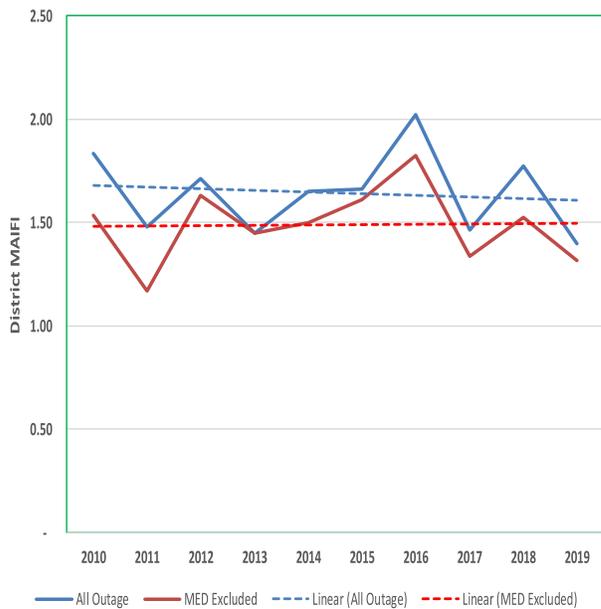
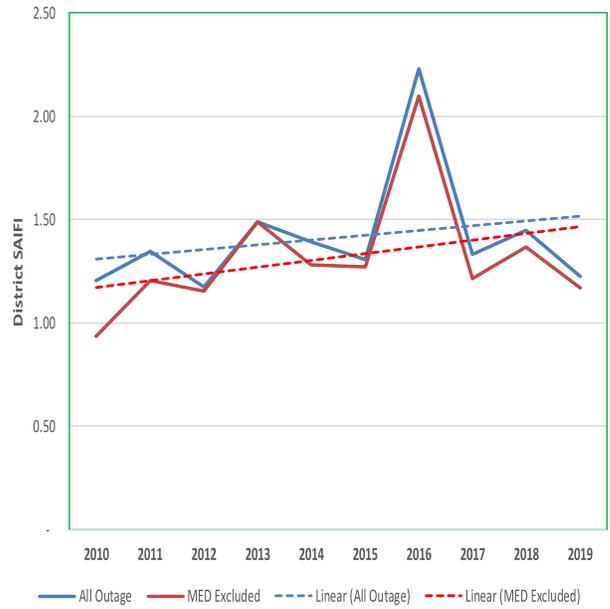
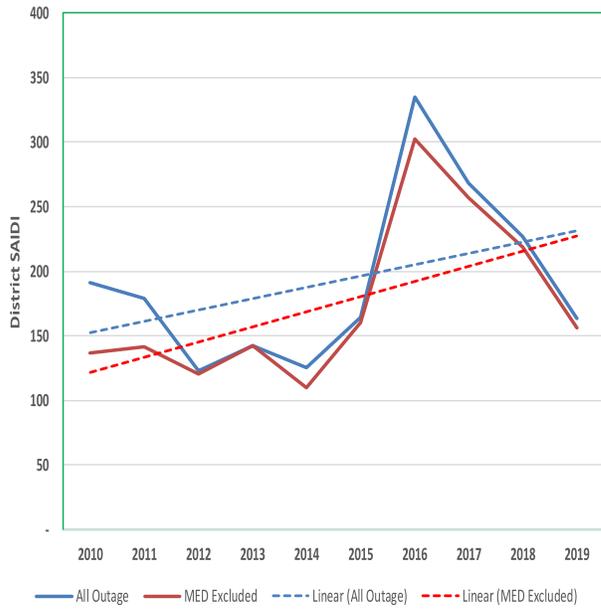
SANTA MONICA District Reliability Performance



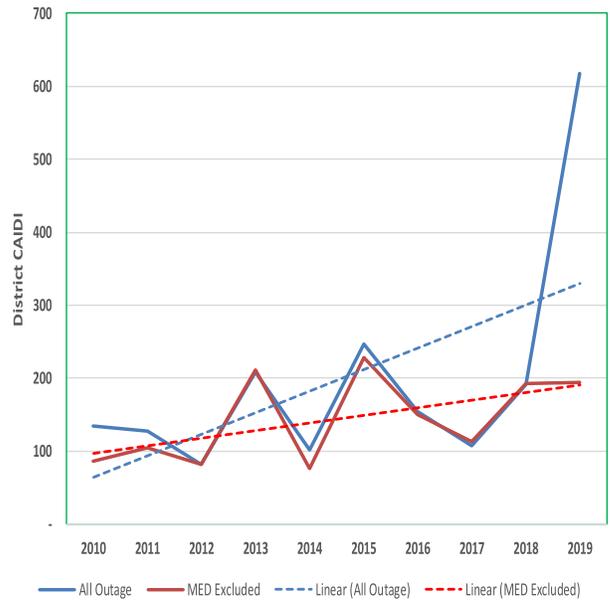
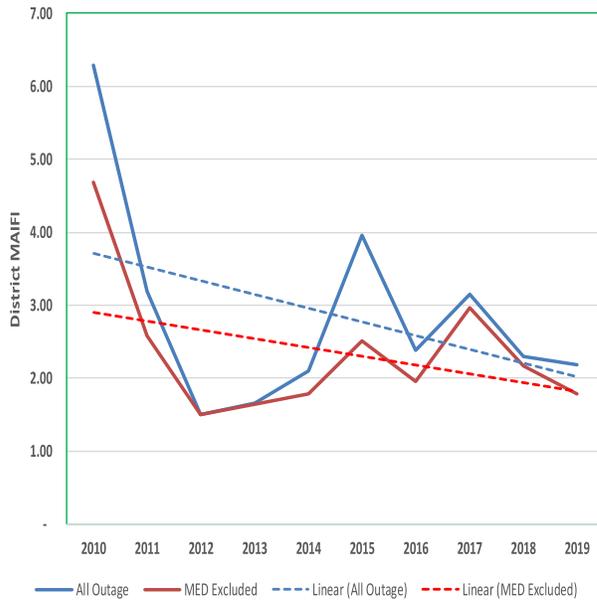
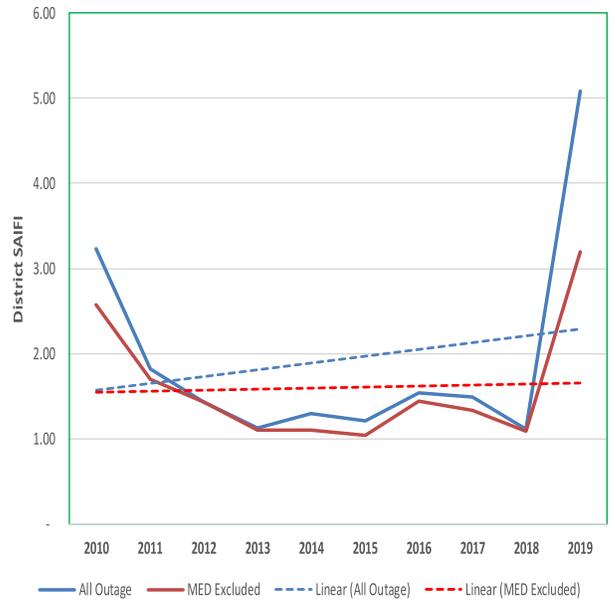
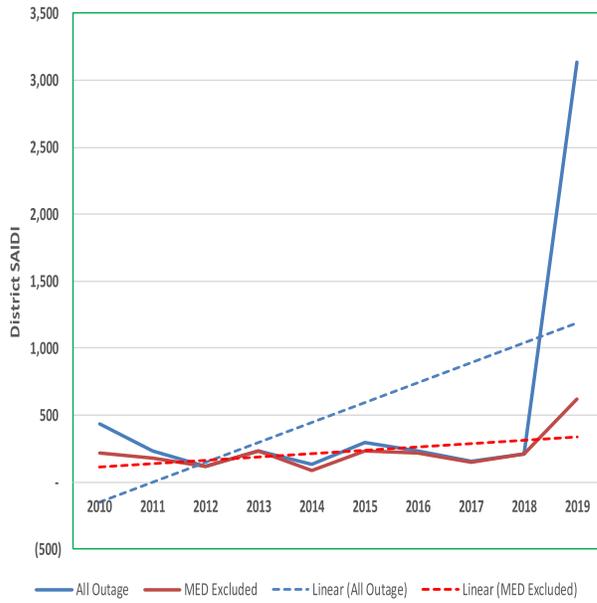
SHAVER LAKE District Reliability Performance



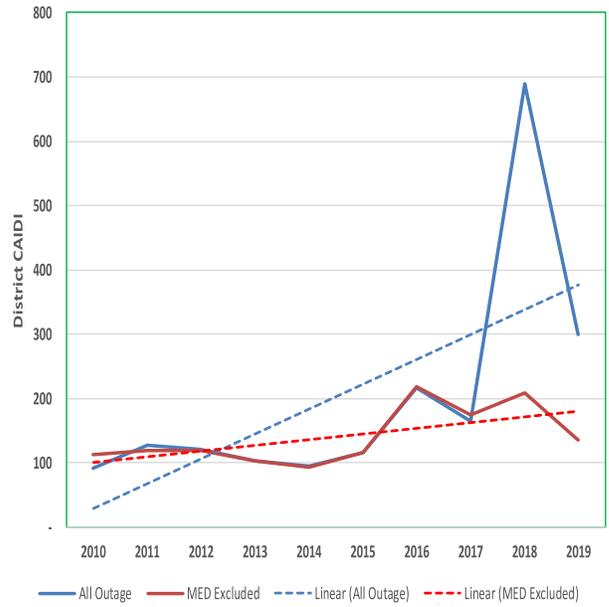
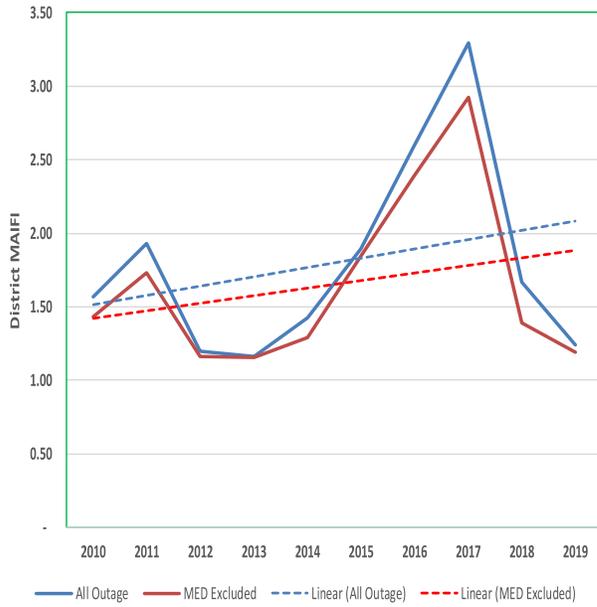
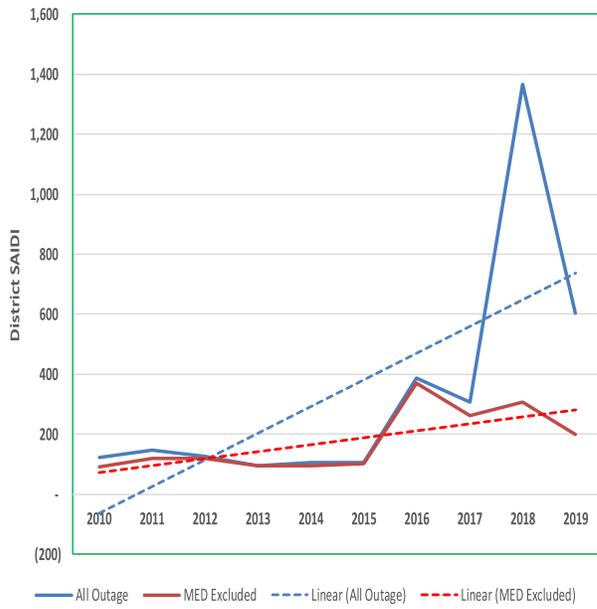
SOUTH BAY District Reliability Performance



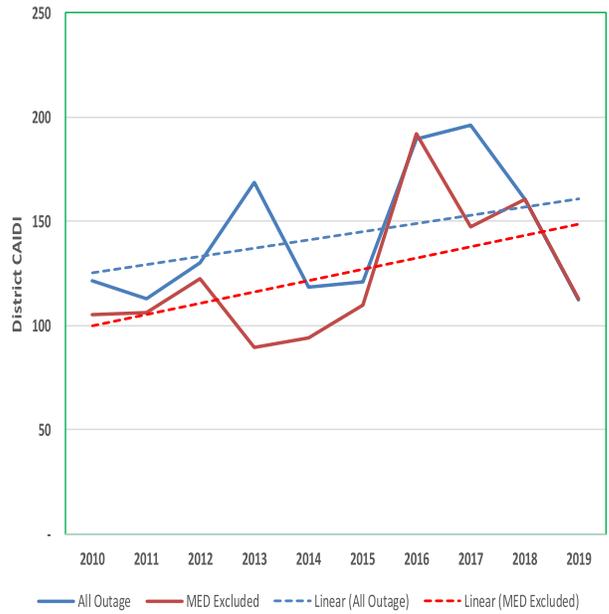
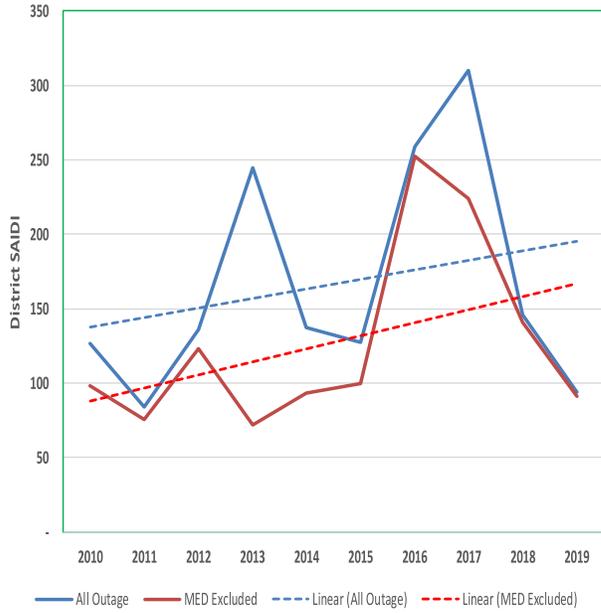
TEHACHAPI District Reliability Performance



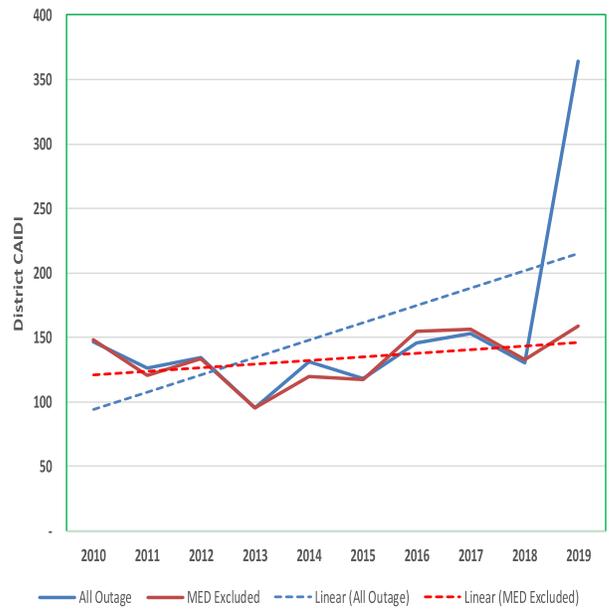
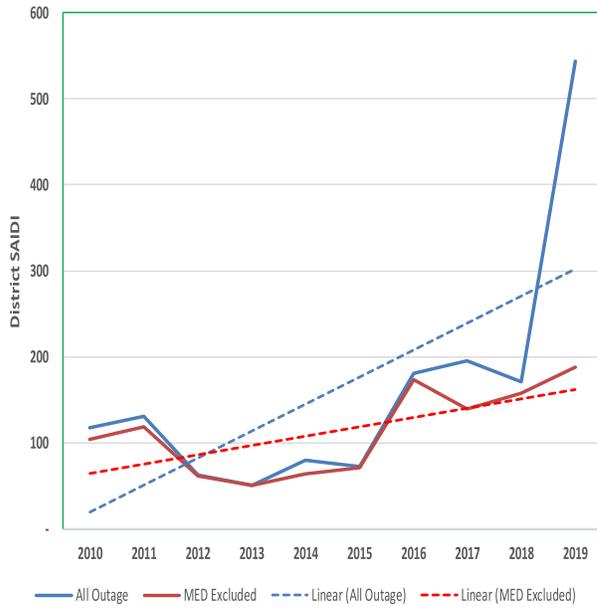
THOUSAND OAKS District Reliability Performance



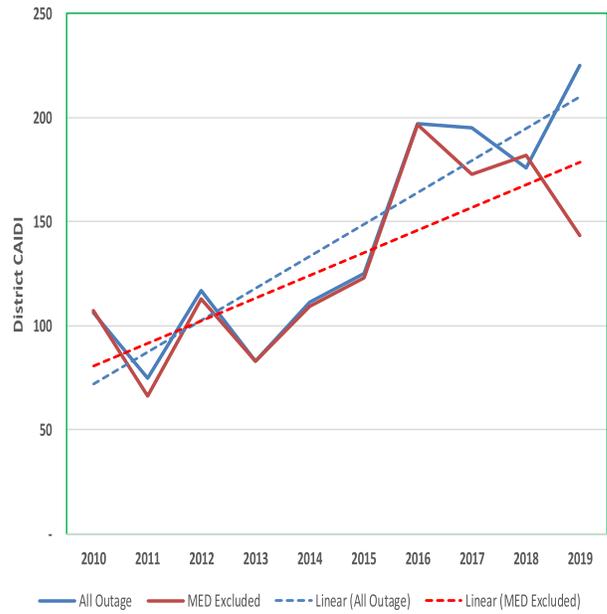
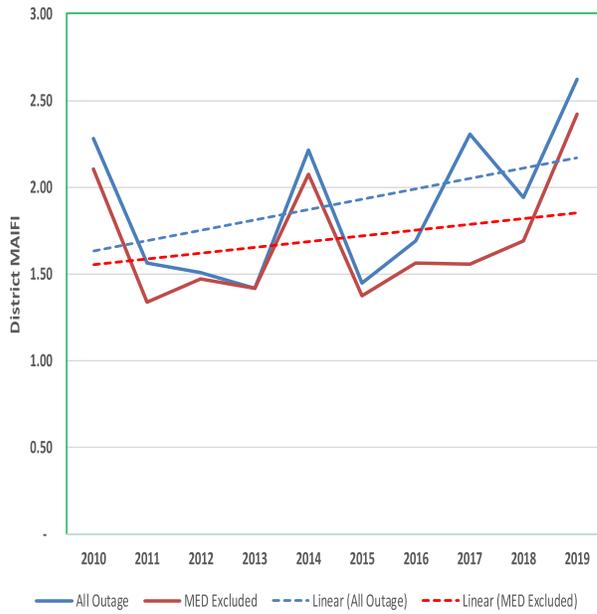
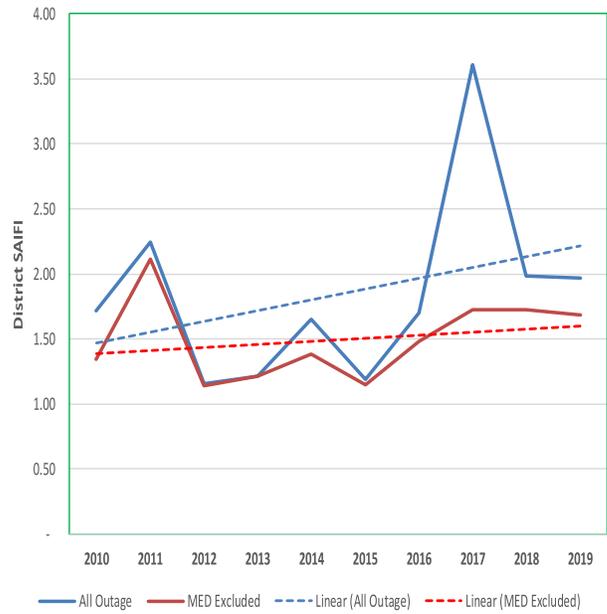
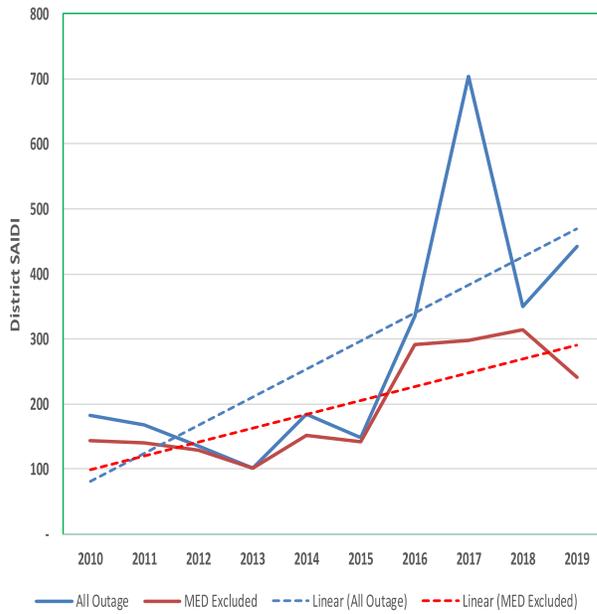
TULARE District Reliability Performance



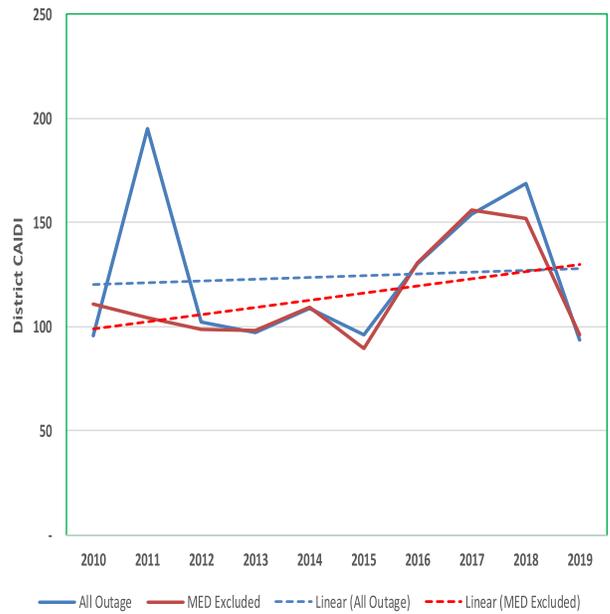
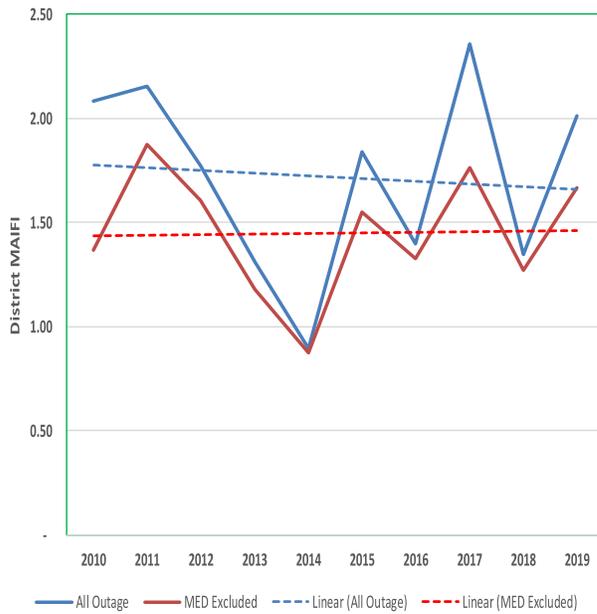
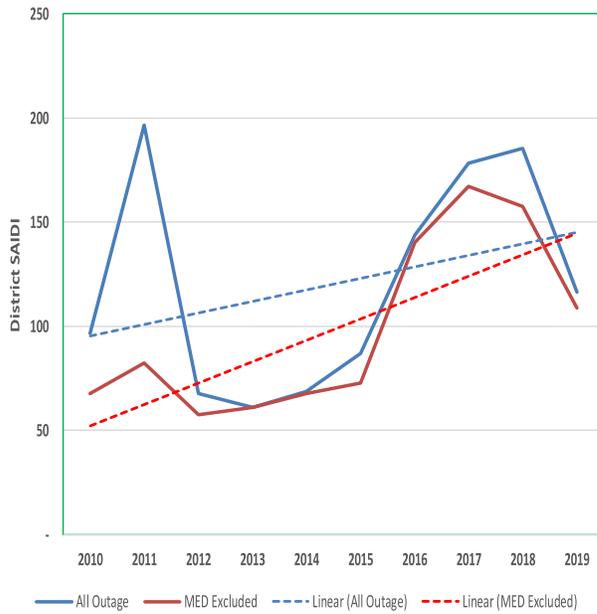
VALENCIA District Reliability Performance



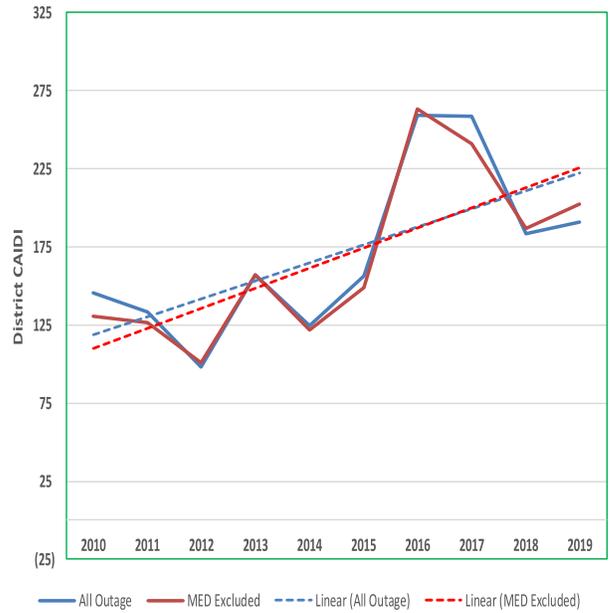
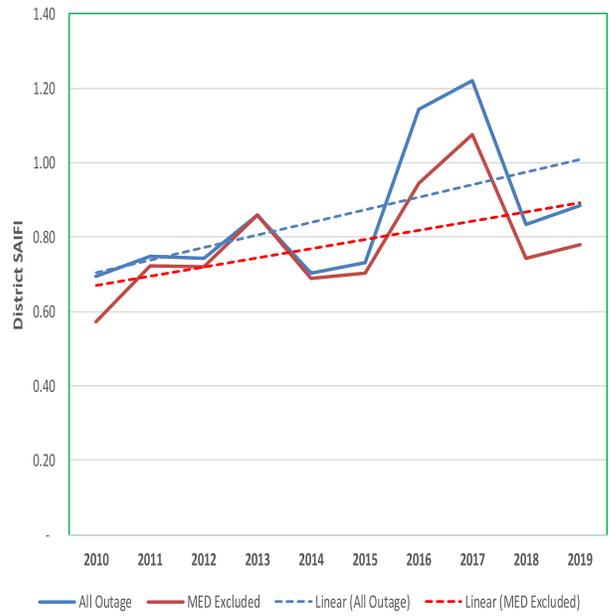
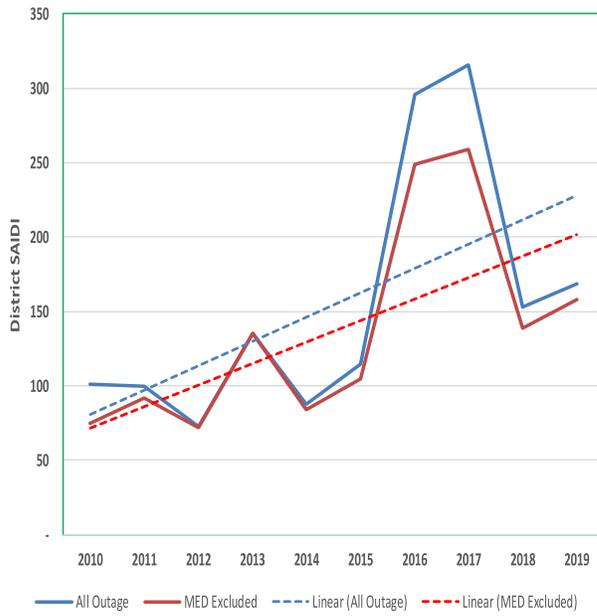
VENTURA District Reliability Performance



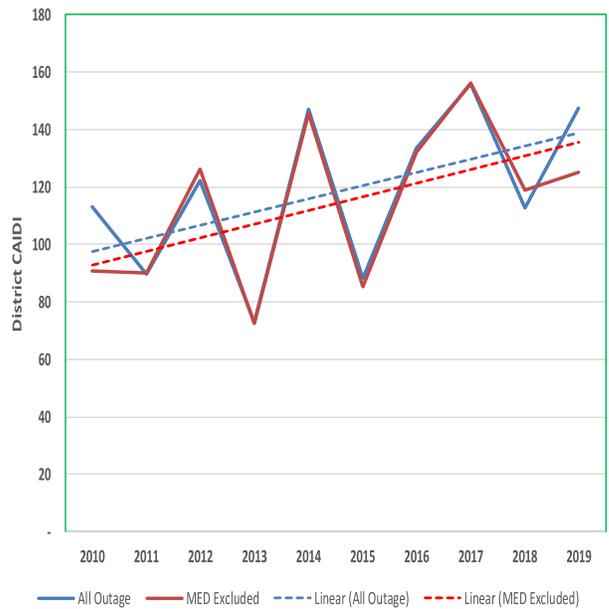
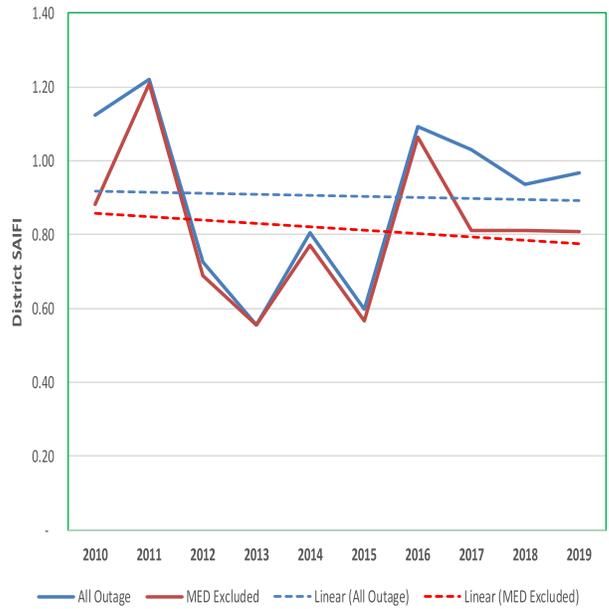
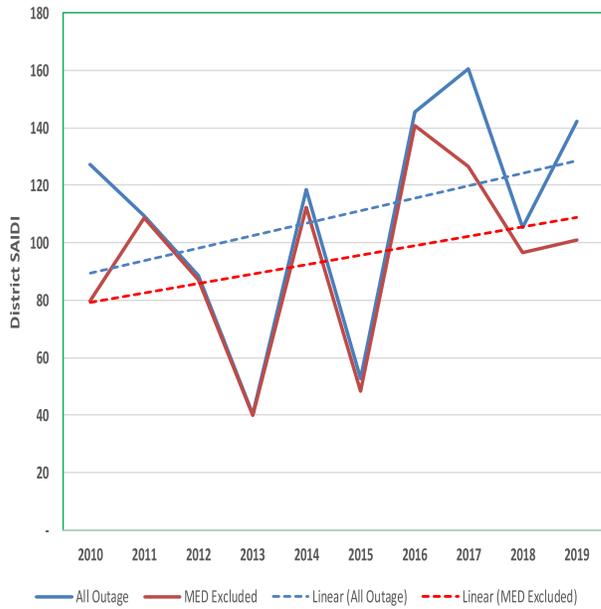
VICTORVILLE District Reliability Performance



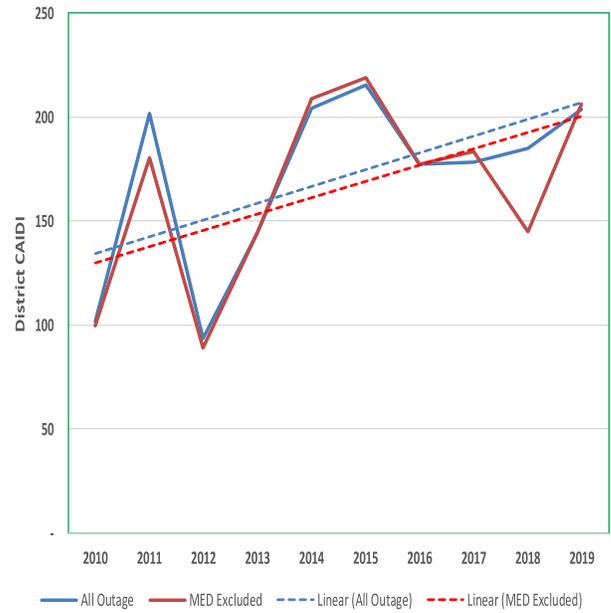
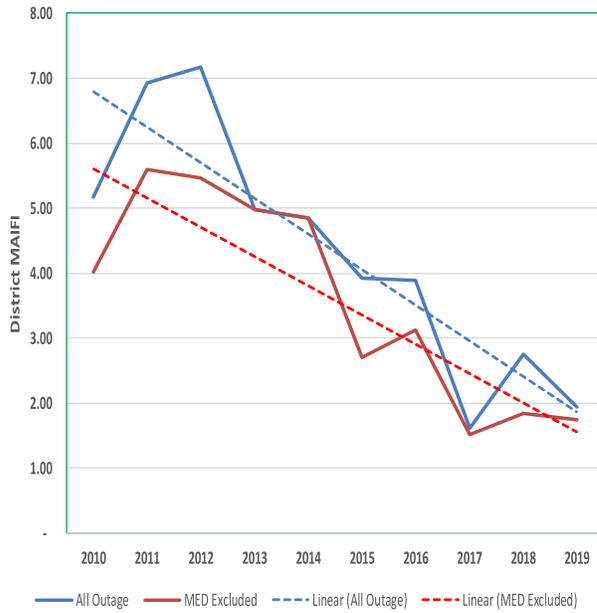
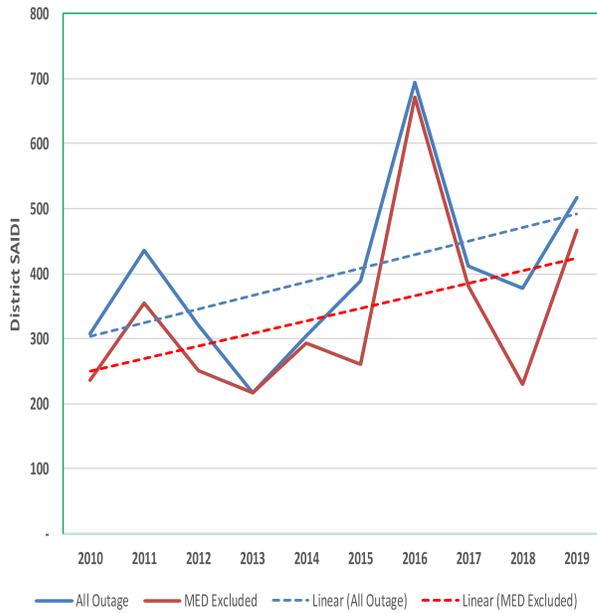
WHITTIER District Reliability Performance



WILDOMAR District Reliability Performance



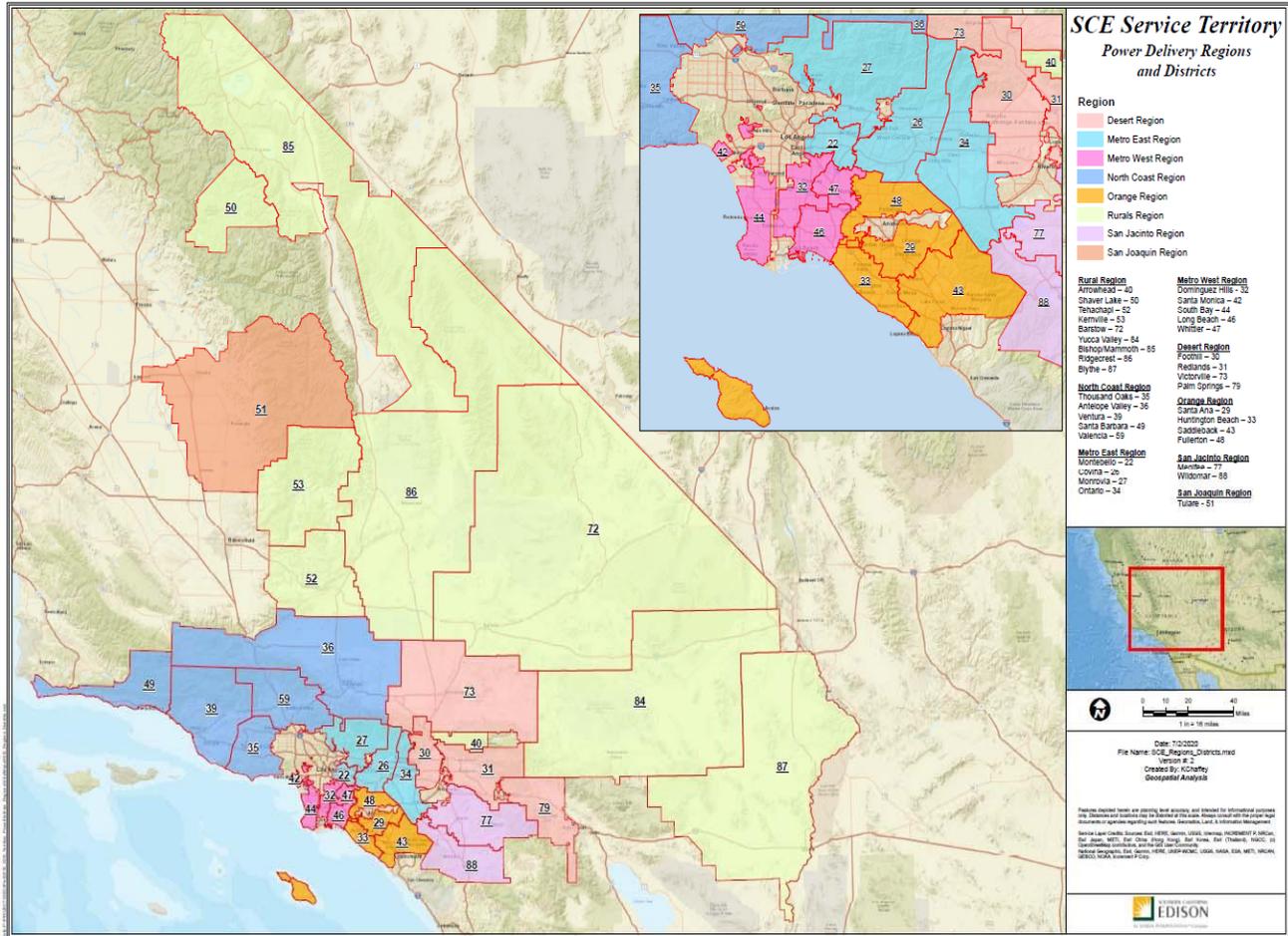
YUCCA VALLEY District Reliability Performance



- b. The information on the number, date, and location of planned outages are provided under seal in a separate report to the Directors of the Energy Division and the Safety Enforcement Division.

SECTION 4 – SERVICE TERRITORY MAP

The following is the SCE Service Territory with Power Delivery Regions and Districts Map. The map contains both SCE district boundaries and county boundaries. SCE has 8 regions and 34 districts.¹³



¹³ Beginning in 2019, Catalina District indices were combined with Huntington Beach since the Catalina District operations have been combined with the Huntington Beach District. SCE will no longer show Catalina as a standalone District and Region in SCE’s territory map.

SECTION 5 – TOP 1% OF WORST PERFORMING CIRCUITS (WPC) EXCLUDING MAJOR EVENT DAY (MED)

SCE's Worst Performing Circuits (WPC) projects typically require two years to progress from circuit review to construction completion. A worst performing circuit rehabilitation identifies enhancements to improve the overall circuit reliability, as well as appropriate replacement of riskiest assets. These circuit enhancements include equipment such as additional switches for isolation, installation of automation, automatic re-closers, branch line fuses (BLFs), and remote fault indicators (RFIs), etc. A project may not be scoped if there is other work already planned that will enhance reliability.

SCE's selection of its WPC's begins with three years of historical data excluding MED and planned outages. Recent years are weighted higher by factors of 61%, 28% and 11%, respectively. The sum of SAIDI for the weighted three years are then ranked in descending order for the SAIDI index. The same methodology is applied to SAIFI for the SAIFI index. The top 1% of circuits SAIDI and top 1% of circuits SAIFI are then listed and reviewed for improvements (See Tables 7 and 8). The method produces 46 circuits based on SAIDI and 46 circuit based on SAIFI.

The below Table 7 and Table 8 capture the top 1% WPC. Table 7 contains the Top 1% WPC using the SAIDI metric and Table 8 contains the Top 1% WPC using the SAIFI metric. The tables provide (1) circuit name, (2) district, (3) customer count, (4) substation name, (5) circuit miles, (6) %UG, (7) %OH, (8) number of mainline outages resulting in the operation of a circuit breaker or automatic re-closer, (9) System Level reliability metric and (10) Circuit Level reliability metric.

Table 7 – Top 1% Worst Performing Circuits Based on SAIDI (Excluding MED)

Circuit	District	2019 Customer Count	Substation	Circuit Miles	%UG	%OH	Circuit Breaker or Auto-Recloser Operation (a)	Sys-SAIDI Rank	Sys-SAIDI (b)	Ckt-SAIDI Rank	Ckt SADFI (c)
Rim 12kV	40	1,915	Burnt Mill 33/12	29.15	0	1	43	1	0.5346	53	1,438
Corsica 16kV	39	6,145	Gonzales 66/16	46.52	1	0	27	2	0.4052	281	340
Castro 16kV	39	2,369	Wakefield 66/16	40.61	0	1	29	3	0.3914	108	851
Cachuma 16kV	49	4,021	Vegas 66/16	80.90	0	1	42	4	0.3817	189	489
Hollywood 16kV	42	3,576	Fairfax 66/16	11.03	1	0	10	5	0.3312	194	477
Campanula 25kV*	84	1,969	Nugget 33/25	132.70	0	1	74	6	0.3046	117	796
Tenneco 12kV*	36	4,733	Frazier Park 66/12	112.90	0	1	21	7	0.2868	312	312
January 12kV*	33	4,372	Lafayette 66/12	23.74	1	0	18	8	0.2617	318	308
Taggart 12kV	40	619	Running Springs 33/12	11.15	0	1	16	9	0.2526	30	2,103
North Shore 12kV	40	1,134	Burnt Mill 33/12	16.52	0	1	21	10	0.2518	72	1,144
Turnbull 12kV	26	1,394	Walnut 66/12	14.76	1	0	5	11	0.2495	94	921
Landers 25kV*	84	1,785	Nugget 33/25	142.90	0	1	76	12	0.2475	128	713
Spinnaker 16kV*	39	4,989	Channel Island 66/16	29.11	0	1	18	13	0.2442	406	252
Surfside 16kV*	39	5,581	Channel Island 66/16	31.62	1	0	21	14	0.2423	469	223
Asteroid 16kV*	22	4,399	Alhambra 66/16	23.02	0	1	12	15	0.2340	367	273
Beachcomber 16kV	42	3,923	Santa Monica 66/16	5.98	0	1	6	16	0.2256	326	296
Peacor 12kV	84	880	Peacor P.T. 33/12	96.78	0	1	39	17	0.2194	59	1,284
Mettler 12kV	52	1,632	Cummings 66/12	32.91	0	1	38	18	0.2168	135	684
Gardea 16kV	22	3,391	Amador 66/16	17.05	0	1	10	19	0.2141	291	325
Windjammer 16kV*	39	6,992	Channel Island 66/16	41.11	1	0	22	20	0.2121	750	156
Rosebud 12kV	50	797	Pitman 33/12	21.88	0	1	22	21	0.1974	60	1,274
Energy 16kV	35	1,700	Chatsworth 66/16	43.74	0	1	22	22	0.1964	151	594
Roi-Tan 12kV	31	2,808	Shandin 115/12	33.72	0	1	22	23	0.1890	260	346
Sundown 12kV	73	2,937	Helendale 33/12	57.90	1	0	20	24	0.1872	284	328
Conifer 16kV	35	3,209	Oak Park 66/16	24.40	1	-	7	25	0.1855	316	297
Scow 12kV	33	4,217	Bolsa 66/12	31.36	1	0	14	26	0.1844	450	225
Cuddeback 12kV	52	1,356	Cummings 66/12	21.20	0	1	31	27	0.1833	131	696
Heavy 33kV	86	13	Randsburg 115/33	43.10	-	1	10	28	0.1769	1	70,106
Brookline 16kV	22	1,536	Rush 66/16	24.09	0	1	16	29	0.1748	150	586
Morongo 12kV	84	708	Morongo P.T. 33/12	35.37	0	1	23	30	0.1728	62	1,256
Perimeter 12kV	50	1,247	Timberwine 33/12	38.68	0	1	21	31	0.1721	124	710
Addis 16kV	44	3,130	Victoria 66/16	13.37	0	1	10	32	0.1717	335	282
Moritz 12kV	40	2,079	Huston 33/12	30.51	0	1	52	33	0.1713	203	424
Veterans 16kV	59	1,814	San Fernando 66/16	24.16	0	1	12	34	0.1713	177	486
Bolton 16kV	32	3,121	Jersey 66/16	23.39	0	1	15	35	0.1706	335	281
Chargers 12kV*	33	3,982	Slater 66/12	29.86	1	0	13	36	0.1696	464	219
Caliente 12kV	52	2,145	Cummings 66/12	34.61	0	1	26	37	0.1672	212	401
Viento 12kV	52	2,920	Monolith 66/12	99.94	0	1	92	38	0.1652	318	291
Otis 16kV	32	3,440	Cudahy 66/16	21.77	0	1	9	39	0.1638	404	245
Ballard 12kV	22	2,208	Narrows 66/12	17.94	0	1	10	40	0.1636	228	381
Raiders 12kV	33	3,633	Slater 66/12	18.64	1	0	10	41	0.1628	427	230
Kay 16kV	22	2,208	Alhambra 66/16	15.72	0	1	5	42	0.1617	230	377
Ravenna 12kV	46	2,128	Cypress 66/12	13.72	1	0	3	43	0.1600	220	387
Mist 16kV	49	394	Capitan 66/16	50.12	0	1	22	44	0.1562	29	2,042
Highball 12kV*	30	1,635	Bloomington 66/12	24.14	0	1	17	45	0.1553	175	487
Skyland 2.4kV	40	852	Huston 33/2.4	7.07	0	1	32	46	0.1551	87	937

Circuits that have appeared in this report that were in last year’s report are marked with an asterisk (*) per D. 16-01-008 Annual Electric Report.

- (a) Includes Sustained and Momentary outages that affected the Circuit Breaker.
- (b) SAIDI is based on a three-year weighted average.
- (c) Ckt SAIDI is based on a three-year weighted factor (Average Customer experience on Circuit).

Table 8 – Top 1% Worst Performing Circuits Based on SAIFI (Excluding MED)

Circuit	District	2019 Customer Count	Substation	Circuit Miles	%UG	%OH	Circuit Breaker or Auto-Recloser Operation (a)	Sys-SAIFI Rank	Sys-SAIFI (b)	Ckt-SAIFI Rank	Ckt SAIFI (c)
Corsica 16kV*	39	6,145	Gonzales 66/16	46.52	1	0	27	1	0.0082	25	7
Sundown 12kV*	73	2,937	Helendale 33/12	57.90	1	0	20	2	0.0034	32	6
Spinnaker 16kV*	39	4,989	Channel Island 66/16	29.11	0	1	18	3	0.0028	193	3
Gardea 16kV	22	3,391	Amador 66/16	17.05	0	1	10	4	0.0027	93	4
January 12kV*	33	4,372	Lafayette 66/12	23.74	1	0	18	5	0.0026	162	3
Surfside 16kV*	39	5,581	Channel Island 66/16	31.62	1	0	21	6	0.0025	319	2
Moritz 12kV	40	2,079	Huston 33/12	30.51	0	1	52	7	0.0024	32	6
Crosson 16kV*	39	4,691	Camarillo 66/16	40.81	1	0	19	8	0.0024	242	3
Salmon 16kV*	44	3,958	El Nido 66/16	18.94	0	1	14	9	0.0024	156	3
Hollywood 16kV*	42	3,576	Fairfax 66/16	11.03	1	0	10	10	0.0023	125	3
Cachuma 16kV*	49	4,021	Vegas 66/16	80.90	0	1	42	11	0.0022	187	3
Windjammer 16kV*	39	6,992	Channel Island 66/16	41.11	1	0	22	12	0.0022	650	2
Jeep 12kV	40	2,057	Arrowhead 33/12	26.25	0	1	33	13	0.0021	42	5
Roi-Tan 12kV	31	2,808	Shandin 115/12	33.72	0	1	22	14	0.0020	107	4
Bolton 16kV	32	3,121	Jersey 66/16	23.39	0	1	15	15	0.0019	141	3
Snead 12kV	33	3,322	Lafayette 66/12	20.78	1	0	6	16	0.0018	191	3
Campanula 25kV*	84	1,969	Nugget 33/25	132.70	0	1	74	17	0.0018	68	5
Raiders 12kV*	33	3,633	Slater 66/12	18.64	1	0	10	18	0.0017	259	2
Kasota 12kV	73	1,789	Victorville 33/12	21.17	1	0	16	19	0.0017	56	5
Rim 12kV	40	1,915	Burnt Mill 33/12	29.15	0	1	43	20	0.0017	67	5
Test 16kV	22	3,692	Alhambra 66/16	28.59	1	0	22	21	0.0017	277	2
Big Rock 16kV	35	2,802	Chatsworth 66/16	27.22	0	1	10	22	0.0017	146	3
Fantail 16kV*	42	4,888	Tahiti 66/16	15.99	1	0	5	23	0.0017	527	2
Scow 12kV	33	4,217	Bolsa 66/12	31.36	1	0	14	24	0.0017	381	2
Hoss 16kV	35	2,395	Royal 66/16	27.85	1	0	15	25	0.0016	113	3
Tenneco 12kV	36	4,733	Frazier Park 66/12	112.90	0	1	21	26	0.0016	544	2
Diablo 16kV*	39	4,266	San Miguel 66/16	38.34	1	0	7	27	0.0016	438	2
Albatross 16kV	42	4,805	Santa Monica 66/16	10.59	1	0	4	28	0.0016	576	2
Octane 16kV	44	3,698	Yukon 66/16	12.42	0	1	12	29	0.0015	333	2
Ebony 16kV*	44	4,188	Torrance 66/16	18.51	1	0	6	30	0.0015	438	2
Saunders 12kV*	77	2,385	Idyllwild 33/12	37.95	0	1	64	31	0.0015	127	3
Jameson 16kV	49	2,797	Santa Barbara 66/16	22.02	1	0	9	32	0.0015	190	3
Conifer 16kV	35	3,209	Oak Park 66/16	24.40	1	-	7	33	0.0015	263	2
Campbell 12kV	51	2,068	Porterville 66/12	41.21	0	1	13	34	0.0015	101	4
Dandelion 12kV	48	2,365	Barre 66/12	16.60	0	1	10	35	0.0015	131	3
Cimarron 16kV*	44	3,679	Inglewood 66/16	15.14	0	1	9	36	0.0014	373	2
Huskie 12kV*	43	3,446	Moulton 66/12	22.14	1	0	2	37	0.0013	388	2
King 16kV*	44	3,806	Victoria 66/16	14.95	1	0	8	38	0.0013	478	2
Otis 16kV*	32	3,440	Cudahy 66/16	21.77	0	1	9	39	0.0013	394	2
Chargers 12kV*	33	3,982	Slater 66/12	29.86	1	0	13	40	0.0013	543	2
Kay 16kV	22	2,208	Alhambra 66/16	15.72	0	1	5	41	0.0013	143	3
Galahad 16kV*	35	2,126	Latigo 66/16	79.81	0	1	21	42	0.0013	135	3
Beachcomber 16kV	42	3,923	Santa Monica 66/16	5.98	0	1	6	43	0.0013	532	2
Rhumba 16kV	44	4,037	Brighton 66/16	16.77	0	1	10	44	0.0013	570	2
Cable 12kV	34	2,066	San Antonio 66/12	16.12	1	0	14	45	0.0013	131	3
Ricardo 16kV	39	2,723	San Miguel 66/16	21.74	0	1	15	46	0.0013	255	2

Circuits that have appeared in this report that were in last year's report are marked with an asterisk (*) per D. 16-01-008 Annual Electric Report.

- (a) Includes Sustained and Momentary outages that affected the Circuit Breaker.
- (b) SAIFI is based on a three-year weighted average.
- (c) Ckt SAIFI is based on a three-year weighted factor (Average Customer experience on Circuit).

Tables 9 and 10 below identify the circuits that are top 1% WPC (by SAIDI or SAIFI this year) *and* were top 1% circuits by SAIDI or SAIFI on SCE's WPC list in 2018. These tables provide the following information:

- i) An explanation of why it was ranked as a "deficient" circuit, i.e., the value of the metric used to indicate its performance.
- ii) A historical record of the metric.
- iii) An explanation of why it was on the deficiency list again.
- iv) An explanation of what is being done to improve the circuit's future performance and the anticipated timeline for completing those activities (or an explanation why remediation is not being planned).
- v) A quantitative description of the utility's expectation for that circuit's future performance.

Table 9 – (SAIDI Preferred Metric – “Repeat Deficient” List)

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	Submitted	iv.	
	2018-2019 Sys-SAIDI Rank	2018-2019 Sys-SAIDI	2017-2018 Sys-SAIDI Rank	2017-2018 Sys-SAIDI			Engineering Scope	Anticipated Completion Year
Campanula 25kV*	6	0.30457	18	0.17135	Projected moved from 2018 operation date to 2019. Project initiated, but not yet constructed.	10/27/2016	24 BLF's 1 Automated Switch 1 RFI	2019
Tenneco 12kV*	7	0.28685	15	0.17992	Projected moved from 2019 operation date to 2020. Project initiated, but not yet constructed.	7/31/2018	13 OH Switches	2020
January 12kV*	8	0.26167	10	0.19075	Project completed, in process of evaluating circuit performance.	11/21/2017	.21 Cond Mi of UG Cable 1 OH Switch 8 UG Switches	2019
Landers 25kV*	12	0.24748	7	0.22380	Projected moved from 2018 operation date to 2019. Project initiated, but not yet constructed.	10/27/2016	78 BLF's 2 Automated Switches 1 RAR	2019
Spinnaker 16kV*	13	0.24418	37	0.14347	Projected moved from 2018 operation date to 2020. Project initiated, but not yet constructed.	10/27/2016	4 Automated Switches 22 BLFs 2.94 Cond Mi of OH Wire	2020
Surfside 16kV*	14	0.24229	4	0.27102	Project completed, in process of evaluating circuit performance.	10/27/2016	2.2 Cond Mi of OH Conductor 4 Automated Switches 10 BLF's	2019
Asteroid 16kV*	15	0.23404	1	0.50764	Projected moved from 2018 operation date to 2020. Project initiated, but not yet constructed.	9/30/2016	1.6 Cond Mi UG Cable 3.3 Cond Mi OH Conductor 3 RFI's 3 Automated Switches 2 OH Swithes 33 BLF's	2020
Windjammer 16kV*	20	0.21206	3	0.27691	Projected moved from 2019 operation date to 2020. Project initiated, but not yet constructed.	1/31/2017	3 Automated Switches 20 BLFs 5 OH Switches	2020
Chargers 12kV*	36	0.16957	13	0.18365	Circuit being evaluated.	-	-	-
Highball 12kV*	45	0.15532	8	0.21253	Project identified, but not yet constructed.	7/31/2018	2 OH Switches 6 BLF's	2020

V. SCE does not have a quantitative description for its circuit future performance since SCE designs reliability improvements for WCR projects at the system level rather than at the individual circuit level. For additional details, please refer to the discussion in SCE's 2018 General Rate Case Testimony, as shown in Exhibit SCE-02, Volume 08, page 23 ("quantitative benefits").

Table 10 – (SAIFI Preferred Metric – “Repeat Deficient” List)

Circuit	i.		ii.		iii. Explanation of Repeat Deficiency	iv.		
	2018-2019 Sys-SAIFI Rank	2018-2019 Sys-SAIFI	2017-2018 Sys-SAIFI Rank	2017-2018 Sys-SAIFI		Submitted	Engineering Scope	Anticipated Completion Year
Corsica 16kV*	1	0.00820	34	0.00140	Project initiated, but not yet constructed.	10/31/2017	.16 Cond Miles of UG Cable 5 Fis 3 Automated Switches 20 BLFs 8 OH Switches	2021
Sundown 12kV*	2	0.00342	22	0.00159	Project completed, in process of evaluating circuit performance.	11/23/2016	7.37 Cond Mi of UG Cable 32 BLF's 2 Automated Switches 6 UG Switches Civil	2019
Spinnaker 16kV*	3	0.00275	9	0.00214	Projected moved from 2018 operation date to 2020.Project initiated, but not yet constructed.	10/27/2016	4 Automated Switches 22 BLFs 2.94 Cond Mi of OH Wire	2020
January 12kV*	5	0.00256	24	0.00153	Project completed, in process of evaluating circuit performance.	11/21/2017	.21 Cond Mi of UG Cable 1 OH Switch 8 UG Switches	2019
Surfside 16kV*	6	0.00246	1	0.00341	Project completed, in process of evaluating circuit performance.	10/27/2016	2.2 Cond Mi of OH Conductor 4 Automated Switches 10 BLF's	2019
Crosson 16kV*	8	0.00238	3	0.00273	Project initiated, but not yet constructed.	9/30/2016	5 BLF's 4 Automated Switches .85 Cond Mi of UG Cable	2020
Salmon 16kV*	9	0.00236	6	0.00221	Project completed, in process of evaluating circuit performance.	10/27/2016	3 Automated Switches	2019
Hollywood 16kV*	10	0.00234	30	0.00142	Project initiated, but not yet constructed.	7/31/2018	5.62 Cond Mi of UG Cable 2 OH Switches	2020
Cachuma 16kV*	11	0.00222	32	0.00141	Projected moved from 2019 operation date to 2020.Project initiated, but not yet constructed.	10/31/2017	8 BLFs 1 Automated Switch 6 OH Switch	2020
Windjammer 16kV*	12	0.00218	10	0.00208	Projected moved from 2019 operation date to 2020.Project initiated, but not yet constructed.	1/31/2017	3 Automated Switches 20 BLFs 5 OH Switches	2020
Campanula 25kV*	17	0.00177	14	0.00180	Projected moved from 2018 operation date to 2020.Project initiated, but not yet constructed.	10/27/2016	24 BLF's 1 Automated Switch 1 RFI	2019
Raiders 12kV*	18	0.00174	23	0.00153	Project initiated, but not yet constructed.	9/27/2018	3 Cond Mi of UG Cable 9 BLFs 7 OH Switches 2 UG Switches	2020
Fantail 16kV*	23	0.00167	16	0.00179	Project completed in 2018. Circuit experienced 4 equipment failures, circuit to be evaluated for additional improvements.	9/30/2016	2.5 Cond Mi of UG Cable 1.57 Cond Mi of OH Conductor 2 UG Switches 4 FI's Civil	2018
Diablo 16kV*	27	0.00157	36	0.00139	Projected moved from 2019 operation date to 2020.Project initiated, but not yet constructed.	11/21/2017	2 Cond Mi of UG Cable 13 BLFs 4 OH Switches	2020
Ebony 16kV*	30	0.00154	27	0.00150	Project completed, in process of evaluating circuit performance.	11/30/2017	.4 Cond Mi of UG Cable 9 BLFs	2019
Saunders 12kV*	31	0.00153	5	0.00226	Project completed, in process of evaluating circuit performance.	10/31/2017	31 BLF's 7 RFI 1 Automated Switch	2019
Cimarron 16kV*	36	0.00145	19	0.00176	Project completed in 2018. Circuit experienced 2 equipment failures, 1 weather interruption , and 3 operation events. Circuit to be evaluated for additional improvements.	10/27/2016	12 BLF's 3 Automated Switches	2018
Huskie 12kV*	37	0.00134	7	0.00221	Circuit being evaluated.	-	-	-
King 16kV*	38	0.00133	21	0.00162	Projected moved from 2018 operation date to 2020.Project initiated, but not yet constructed.	10/27/2016	.3 Con Mi of UG Cable 4 Overhead Switches 6 Automated Switches 1 RFI 1 BLF	2020
Otis 16kV*	39	0.00132	43	0.00130	Projected moved from 2019 operation date to 2020.Project initiated, but not yet constructed.	10/31/2017	6 OH Switches 8 BLF's	2020
Chargers 12kV*	40	0.00132	41	0.00131	Circuit being evaluated.	-	-	-
Galahad 16kV*	42	0.00131	26	0.00152	Project initiated, but not yet constructed.	11/23/2016	3.7 Cond Mi of UG Cable 2.0 Cond Mi of OH Conductor 129 BLF's 5 FI's 1 OH Switch 1 Automated Switch Civil	2020

V. SCE does not have a quantitative description for its circuit future performance since SCE designs reliability improvements for WCR projects at the system level rather than at the individual circuit level. For additional details, please refer to the discussion in SCE's 2018 General Rate Case Testimony, as shown in Exhibit SCE-02, Volume 08, page 23 ("quantitative benefits").

SECTION 6 – TOP 10 MAJOR UNPLANNED POWER OUTAGE EVENTS WITHIN A REPORTING YEAR

Table 11 below captures the top 10 major unplanned outage events for 2019 including the cause and location of the outage. Table 12 captures the number of customers without power in hourly intervals for the 2019 Top 10 outages.

Table 11 – Top 10 Major Unplanned Outage Events (2019)

Rank	System Outage ID	Switching Center	Cause Description	SAIDI	Date	Number of Customers Affected	Longest Individual Customer Interruption (minutes)
1	336358	ORANGE COUNTY	Lost Source Substation	4.620	8/2/2019	37,714	6,348
2	338863	CONTROL	Lost Source Substation	2.291	9/16/2019	13,242	40,884
3	344450	VISTA	Wind OH Equip. Conductor/Wire	2.202	12/26/2019	8,970	15,027
4	342810	VISTA	No Cause Found Unknown Patrolled	1.644	11/28/2019	14,106	21,127
5	339320	CONTROL	Unknown Transmission Equipment Conductor	1.608	10/5/2019	16,311	13,149
6	340707	VISTA	PSPS Pub. Safety Switch/Disconnect/Ar	1.421	10/30/2019	2,462	9,039
7	344416	VISTA	Lost Source Substation	1.294	12/26/2019	40,765	11,642
8	340669	VINCENT	PSPS Pub. Safety Switch/Disconnect/Ar	1.201	10/30/2019	2,932	2,113
9	340627	VINCENT	PSPS Pub. Safety Switch/Disconnect/Ar	1.101	10/30/2019	3,105	12,038
10	340690	VISTA	PSPS Pub. Safety Switch/Disconnect/Ar	1.049	10/30/2019	2,288	2,361

Table 12 – Number of Customers without Power in Hourly Intervals

Ranking	1	2	3	4	5	6	7	8	9	10
System Outage ID	336358	338863	344450	342810	339320	340707	344416	340669	340627	340690
Outage Start Hour	8/2/2019 6:18:19 PM	9/16/2019 1:03:00 PM	12/26/2019 7:56:00 PM	11/28/2019 5:29:00 PM	10/5/2019 3:13:00 AM	10/30/2019 1:37:00 AM	12/26/2019 7:37:00 AM	10/30/2019 4:47:00 AM	10/30/2019 3:39:00 AM	10/30/2019 8:22:02 AM
0 - 1 Hour	2583	13242	569	7053	8699	2462	40765	2846	3105	2288
1 - 2 Hour	25372	13242	569	7053	9978	2462	20235	2846	3105	2288
2 - 3 Hour	25372	13242	569	7053	13499	2462	16952	2932	3105	2288
3 - 4 Hour	25371	13242	569	7053	13499	2462	7355	2932	3105	2288
4 - 5 Hour	20175	13242	569	7053	13499	2462	7355	2932	3105	2288
5 - 6 hour	17202	13242	569	7053	13499	2462	7355	2932	3105	2288
6 - 7 Hour	14057	13242	569	7053	13499	2462	6449	2932	3105	2288
7 - 8 Hour	13076	13242	569	7053	13499	2462	4906	2932	3105	2288
8 - 9 Hour	12406	13242	569	7053	13499	2462	3257	2932	3105	2288
9 - 10 Hour	12406	13242	569	7053	13499	2462	2011	2932	2947	2288
10 - 11 Hour	12406	11949	569	7053	12953	2462	2011	2932	2947	2288
11 - 12 Hour	9123	10662	569	7053	2053	2462	2011	2932	2947	2288
12 - 13 Hour	9097	7768	569	7053	1143	2462	2011	2932	2947	2288
13 - 14 Hour	9097	4633	569	7053	1143	2462	2011	2932	2947	2288
14 - 15 Hour	9097	3360	569	7053		2462	2011	2932	2947	2288
15 - 16 Hour	9097	2595	569	7053		2462	2011	2932	2947	2288
16 - 17 Hour	9097	2595	569	7053		2462	2011	2932	2947	2288
17 - 18 Hour	9097	2595	569	7053		2462	2011	2932	2947	2288
18 - 19 Hour	9097	2595	569	7053		2462	2011	2932	2947	2288
19 - 20 Hour	9097	2595	569	7053		2462	2011	2932	2947	2288
20 - 21 Hour	9097	2595	569	1758		2462		2932	2947	2288
21 - 22 Hour	9097	2595	569	1758		2462		2932	2947	2288
22 - 23 Hour	9097	2595	569	1758		2462		2932	2947	2288
23 - 24 Hour	11885	2595	569	1758		2462		2932	2947	2288
After24Hour (includes interruptions started at later days/Hours)	14799	1989	8970			2462		2932	2947	2288

SECTION 7 – SUMMARY LIST OF MED PER IEEE 1366

Table 13 below captures all MED occurring in 2019 per IEEE 1366 definition of MED. The information includes the number of customers without service at periodic intervals, the cause and the location of each Major Event.

Table 13 – Summary list of MED Per IEEE (2019)

Location	ME, MW, NC	MW, O, R	MW, ME, NC	O, D, SJC	D,O,R	ME, MW, R	D, NC, R	D, NC, R	D, NC, R	D, MW, R
Outage Duration	2/2/2019	2/14/2019	4/9/2019	8/2/2019	9/16/2019	10/5/2019	10/10/2019	10/24/2019	10/28/2019	10/29/2019
0 to 1 hour	195,335	162,542	136,734	22,610	11,212	30,541	30,441	40,255	33,632	34,196
1 to 5 hours	28,174	28,784	23,426	13,542	2,187	4,995	15,251	10,763	8,914	6,227
5 to 10 hours	2,876	3,116	4,081	2,908	1,509	3,215	4,136	3,930	13,963	827
10 to 15 hours	3,196	1,534	1,178	3,354	9,369	10,942	386	700	12,054	232
15 to 20 hours	941	742	900	111	23		3,121	3,660	20	370
20 to 24 hours	636	48	496		956		369	4,767	146	
1 to 2 days	896	278	1,410	9,097	2,882		16,700	18,449	298	2,914
2 to 3 days		61					390	182		9
3 to 4 days		186						10		
4 to 5 days		7								
5 to 6 days								14		
6 to 7 days		2								
>= 7 days		28					5			
Total	232,054	197,328	168,225	51,622	28,138	49,693	70,799	82,730	69,027	44,775

Location	D, NC, R	D, MW, R	D, SJC, R	D, NC, R	D, O, R
Outage Duration	10/30/2019	11/28/2019	11/29/2019	12/26/2019	12/27/2019
0 to 1 hour	39,617	138,359	49,769	139,269	26,293
1 to 5 hours	24,363	29,113	18,133	41,523	3,470
5 to 10 hours	20,216	2,960	1,397	21,753	2,590
10 to 15 hours	18,577	1,124	1,912	1,260	318
15 to 20 hours	6,784	5,535	6,390	2,579	161
20 to 24 hours	8,867	3,989	539	153	7,901
1 to 2 days	42,374	2,372	576	1,843	28
2 to 3 days	3,115	1,693	284	156	
3 to 4 days	9	2,474	232	197	
4 to 5 days		1,132	107	312	
5 to 6 days		411			
6 to 7 days		8			
>= 7 days	1	8		9	
Total	163,923	189,178	79,339	209,054	40,761

Note:

- D - DESERT**
- ME - METRO EAST**
- MW - METRO WEST**
- NC - NORTH COAST**
- O - ORANGE**
- R - RURALS**
- SJC - SAN JACINTO**
- SJQ - SAN JOAQUIN**

SECTION 8 - Historical Ten Largest Unplanned Outage Events for the past 10 Years

Table 14 below captures the ten largest unplanned outage events for each of the years from 2010-2019.

Table 14 – Historical Top 10 Outage Events (2019)

Rank	Cause Description	System Outage ID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location	
								Switching Center
2019								
1	LOST SOURCE SUBSTATION	336358	8/2/2019	4.620	37,714	6,348		ORANGE COUNTY
2	LOST SOURCE SUBSTATION	338863	9/16/2019	2.291	13,242	40,884		CONTROL
3	WIND OVERHEAD EQUIPMENT CONDUCTOR/WIRE	344450	12/26/2019	2.202	8,970	15,027		VISTA
4	NO CAUSE FOUND UNKNOWN PATROLLED	342810	11/28/2019	1.644	14,106	21,127		VISTA
5	UNKNOWN TRANSMISSION EQUIPMENT CONDUCTOR	339320	10/5/2019	1.608	16,311	13,149		CONTROL
6	PUB. SAFETY POWER SHUTDOWN PUB. SAFETY SWITCH/DISCONNECT/AR	340707	10/30/2019	1.421	2,462	9,039		VISTA
7	LOST SOURCE SUBSTATION	344416	12/26/2019	1.294	40,765	11,642		VISTA
8	PUB. SAFETY POWER SHUTDOWN PUB. SAFETY SWITCH/DISCONNECT/AR	340669	10/30/2019	1.201	2,932	2,113		VINCENT
9	PUB. SAFETY POWER SHUTDOWN PUB. SAFETY SWITCH/DISCONNECT/AR	340627	10/30/2019	1.101	3,105	12,038		VINCENT
10	PUB. SAFETY POWER SHUTDOWN PUB. SAFETY SWITCH/DISCONNECT/AR	340690	10/30/2019	1.049	2,288	2,361		VISTA
2018								
1	LOST SOURCE SUBSTATION	320389	11/13/2018	7.577	2,828	47,832		VENTURA
2	FIRE STRUCTURE POLE	320287	11/12/2018	4.159	914	44,776		VENTURA
3	PUBLIC AGENCY DENIED ACCESS POLE	320225	11/9/2018	3.703	2,141	8,867		VENTURA
4	LOST SOURCE SUBSTATION	320091	11/11/2018	2.743	833	31,785		VENTURA
5	LOST SOURCE SUBSTATION	320324	11/15/2018	2.463	2,492	46,234		VENTURA
6	PUBLIC AGENCY DENIED ACCESS POLE	320390	11/9/2018	2.421	2,085	5,954		VENTURA
7	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	313579	7/25/2018	2.199	7,732	4,189		VALLEY
8	LOST SOURCE SUBSTATION	319319	11/9/2018	2.063	1,743	27,656		VENTURA
9	LOST SOURCE DISTRIBUTION LINE	318316	10/15/2018	1.306	5,475	2,021		VALLEY
10	LOST SOURCE SUBSTATION	319972	11/9/2018	0.933	2,313	30,448		VENTURA
2017								
1	LOST SOURCE SUBSTATION	303349	12/4/2017	4.998	181,830	1,377		VENTURA
2	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	298030	8/29/2017	3.023	1,008	32,392		RECTOR
3	FIRE STRUCTURE POLE	303217	12/4/2017	2.259	6,841	16,826		VENTURA
4	TOPPLED/BROKEN STRUCTURE POLE	286230	1/22/2017	2.045	5,236	10,393		RECTOR
5	FIRE STRUCTURE POLE	303315	12/5/2017	1.849	4,640	19,065		VENTURA
6	FIRE TRANSMISSION EQUIPMENT CONDUCTOR	303350	12/4/2017	1.450	85,545	262		VENTURA
7	LOST SOURCE SUBSTATION	301515	12/7/2017	0.923	2,824	1,940		VALLEY
8	FIRE TRANSMISSION EQUIPMENT CONDUCTOR	302696	12/10/2017	0.898	84,977	66		VENTURA
9	BALLOON OVERHEAD EQUIPMENT POTHEAD	290334	4/30/2017	0.740	12,818	797		VISTA
10	LOST SOURCE SUBSTATION	302693	12/4/2017	0.622	175,978	18		VENTURA
2016								
1	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	272685	4/29/2016	1.507	40,012	451		VALLEY
2	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	278786	8/19/2016	1.298	1,238	18,457		RECTOR
3	FIRE STRUCTURE POLE	276042	6/23/2016	1.171	7,608	3,666		RECTOR
4	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	267639	1/7/2016	0.979	12,812	2,424		VISTA
5	OVERLOAD/FATIGUE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	275066	6/20/2016	0.928	16,162	1,572		LIGHTHIPE
6	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	276005	6/23/2016	0.880	1,678	9,359		RECTOR
7	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	276561	6/23/2016	0.840	664	11,716		RECTOR
8	FIRE OVERHEAD EQUIPMENT CONDUCTOR/WIRE	275884	6/23/2016	0.830	440	9,546		RECTOR
9	SUBSTATION MAINTENANCE ERROR DURING ROUTINE WORK	280501	10/11/2016	0.694	103,448	304		EL NIDO
10	BALLOON OVERHEAD EQUIPMENT CONDUCTOR/WIRE	269108	2/15/2016	0.640	8,220	696		EL NIDO
2015								
1	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	257095	7/15/2015	2.316	3,849	3,035		LIGHTHIPE
2	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	257307	7/15/2015	0.783	1,329	3,372		LIGHTHIPE
3	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	258625	8/13/2015	0.611	5,884	1,136		DEVERS
4	TOPPLED/BROKEN STRUCTURE POLE	261130	9/9/2015	0.467	4,301	7,215		MIRA LOMA
5	UNKNOWN UNDERGROUND EQUIPMENT CABLE	257337	7/15/2015	0.452	1,801	3,539		LIGHTHIPE
6	OTHER-SEE NOTES STRUCTURE POLE	257205	7/19/2015	0.446	3,906	1,247		VALLEY
7	N/A UNKNOWN NOT PATROLLED	262924	10/15/2015	0.436	10,130	581		VISTA
8	UNKNOWN UNDERGROUND EQUIPMENT CABLE	261743	9/19/2015	0.411	4,024	906		ORANGE COUNTY
9	UNKNOWN SUBSTATION EQUIPMENT CIRCUIT BREAKER	261051	9/15/2015	0.387	17,282	135		LIGHTHIPE
10	LANDSLIDE/MUDSLIDE STRUCTURE POLE	267353	10/18/2015	0.382	18	106,745		ELDORADO

Rank	Cause Description	System Outage ID	Date	SAIDI	Number of Customers Affected	Longest Individual Customer Interruption (minutes)	Location	
							Switching Center	
1	BUSHING SUBSTATION EQUIPMENT CIRCUIT BREAKER	247325	12/22/2014	2.155	20,314	741	VISTA	
2	LOST SOURCE SUBSTATION	239280	7/24/2014	0.808	29,678	345	ORANGE COUNTY	
3	TOPPLED/BROKEN STRUCTURE POLE	236393	5/14/2014	0.739	5,694	1,033	VALLEY	
4	UNKNOWN UNDERGROUND EQUIPMENT CABLE	247704	12/31/2014	0.464	1,308	4,188	VALLEY	
5	UNKNOWN OVERHEAD EQUIPMENT POTHEAD	245855	11/23/2014	0.401	1,395	1,440	DEVERS	
6	OTHER-SEE NOTES STRUCTURE SUBSTATION STRUCTURE/RACK	239913	7/30/2014	0.399	6,895	503	MESA	
7	OVERLOADED SUBSTATION EQUIPMENT TRANSFORMER BANK	243293	10/2/2014	0.384	51,167	293	VENTURA	
8	TOPPLED/BROKEN STRUCTURE POLE	245458	11/16/2014	0.365	785	2,329	DEVERS	
9	LOST SOURCE SUBSTATION	232941	2/28/2014	0.351	25,087	87	VENTURA	
10	TESTING/TROUBLESHOOTING STANDARD OPERATION OPERATOR/CREW	246973	12/15/2014	0.348	2,423	2,398	ORANGE COUNTY	
2013								
1	LOST SOURCE SUBSTATION	224692	8/19/2013	6.316	125,876	1,729	RECTOR	
2	UNKNOWN TRANSMISSION EQUIPMENT CONDUCTOR	226855	9/15/2013	1.500	107,741	381	EL NIDO	
3	SUDDEN PRESSURE DEVICE SUBSTATION EQUIPMENT TRANSFORMER BANK	221685	6/28/2013	1.111	64,709	164	LIGHTHIPE	
4	UNKNOWN OVERHEAD EQUIPMENT TRANSFORMER	217672	4/9/2013	0.801	5,613	1,453	LIGHTHIPE	
5	LIGHTNING SUBSTATION EQUIPMENT CIRCUIT BREAKER	215922	2/8/2013	0.728	30,145	883	LIGHTHIPE	
6	UNKNOWN UNDERGROUND EQUIPMENT CABLE	223292	7/26/2013	0.618	5,904	1,443	ORANGE COUNTY	
7	UNKNOWN UNDERGROUND EQUIPMENT CABLE	229947	12/15/2013	0.543	1,572	1,867	EL NIDO	
8	VANDALISM SUBSTATION EQUIPMENT BUS/CONDUCTOR	218242	4/24/2013	0.519	22,217	304	VALLEY	
9	PULLED APART OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	214695	1/1/2013	0.440	4,979	1,395	MESA	
10	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	218132	4/26/2013	0.437	2,911	1,483	LIGHTHIPE	
2012								
1	UNKNOWN UNDERGROUND EQUIPMENT CABLE	200972	2/3/2012	0.923	31	147,812	CONTROL	
2	UTILITY CONTACT TRANSMISSION EQUIPMENT INSULATOR	206814	8/21/2012	0.711	815	4,320	RECTOR	
3	UNKNOWN SUBSTATION EQUIPMENT RELAY	195706	2/14/2012	0.570	21,253	181	ORANGE COUNTY	
4	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	211557	11/10/2012	0.491	7,670	1,202	VENTURA	
5	DETERIORATION STRUCTURE POLE	201705	6/5/2012	0.490	5,117	978	VINCENT	
6	UNKNOWN STRUCTURE CROSSARM	212445	12/11/2012	0.477	15,674	170	VISTA, DEVERS	
7	OTHER-SEE NOTES SUBSTATION EQUIPMENT TRANSFORMER BANK	207499	9/15/2012	0.443	3,320	1,320	MESA, MIRA LOMA	
8	LOST SOURCE SUBSTATION	206078	8/23/2012	0.427	17,529	189	RECTOR	
9	LIGHTNING OVERHEAD EQUIPMENT CONDUCTOR/WIRE	210892	10/11/2012	0.410	3,687	1,981	MESA	
10	UNKNOWN UNDERGROUND EQUIPMENT CABLE	199511	4/20/2012	0.352	3,559	4,022	LIGHTHIPE	
2011								
1	TOPPLED/BROKEN STRUCTURE POLE	193063	11/30/2011	3.000	6,321	8,373	MESA	
2	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193495	11/30/2011	2.917	3,722	8,575	MESA	
3	WIND OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193921	11/30/2011	2.810	4,118	3,379	MESA	
4	TOPPLED/BROKEN STRUCTURE POLE	193361	11/30/2011	2.654	4,566	8,337	MESA	
5	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	192988	11/30/2011	2.498	4,068	8,072	MESA	
6	TOPPLED/BROKEN STRUCTURE POLE	193802	11/30/2011	2.203	2,062	7,552	MESA	
7	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	192826	12/1/2011	2.166	2,429	8,105	MESA	
8	ICE/SNOW TRANSMISSION EQUIPMENT CONDUCTOR HARDWARE	176231	3/20/2011	1.970	15,135	6,305	VINCENT	
9	WIND OVERHEAD EQUIPMENT CONDUCTOR/WIRE	193447	12/1/2011	1.796	2,324	7,165	MESA	
10	N/A UNKNOWN PATROLLED	182898	1/1/2011	1.742	33	260,236	CONTROL	
2010								
1	TOPPLED/BROKEN STRUCTURE POLE	135650	1/21/2010	1.207	2,651	6,142	DEVERS	
2	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	135801	1/20/2010	1.038	2,011	13,285	RECTOR	
3	UNKNOWN OVERHEAD EQUIPMENT SPLICE/CONNECTOR/TAP	137790	2/27/2010	0.813	6,878	1,128	EL NIDO	
4	LIGHTNING SUBSTATION EQUIPMENT BUS/CONDUCTOR	163903	10/1/2010	0.797	113,070	1,479	ORANGE COUNTY	
5	VEGETATION BLOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	136464	1/21/2010	0.765	479	8,718	VISTA	
6	OPEN FOR REPAIRS STANDARD OPERATION OPERATOR/CREW	145558	6/7/2010	0.758	3,876	996	DEVERS	
7	UNKNOWN OVERHEAD EQUIPMENT CONDUCTOR/WIRE	136448	1/22/2010	0.742	562	12,184	VISTA	
8	TOPPLED/BROKEN STRUCTURE POLE	135277	1/21/2010	0.675	1,679	8,438	DEVERS	
9	EXTERNAL COMPONENT OVERHEAD EQUIPMENT SWITCH/DISCONNECT/AR	135727	1/23/2010	0.673	1,918	1,727	RECTOR	
10	PROTECTION SUBSTATION EQUIPMENT CIRCUIT BREAKER	164418	10/19/2010	0.585	77,652	145	VENTURA	

SECTION 9 – THE NUMBER OF CUSTOMER INQUIRIES ON RELIABILITY DATA AND THE NUMBER OF DAYS PER RESPONSE.

In 2019, SCE received a total of 68 customer inquiries relating to circuit outage history or reliability data. SCE responded to 38% of the inquiries within 7 business days, 43% of the inquiries within 15 business days and 19% in a time frame greater than 15 business days.

Appendix

Circuit SAIFI

The number of times the average customer on the circuit experienced an outage lasting more than 5 minutes.

Circuit SAIDI

The amount of time the average customer on the circuit was without power due to outages lasting longer than 5 minutes.