Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 10/17/2020

Question DG-MISC-43 Supplemental:
Supplemental follow-up to DG-MISC-43 from Data Request 5.

Provide updated data similar to that provided in Items D and E to include: 2019 values for SAIDI and SAIFI, and if available, MAIFI, and CAIFI numbers from 2009-2019 for the following locations:

1. Each of the transformers at Valley South substation (per transformer if available)

2. Entire Valley South substation (per substation)

3. SCE system

Response to Question DG-MISC-43 Supplemental:

In SCE's experience, analyses of historical distribution system reliability metrics are most meaningful and materially useful when based on a 3-5 year historical record. This is why SCE provided the data in Items D and E based on 5 years of historical data (2014-2018).[1] Consistent with this practice, SCE will provide updated reliability information for 2015-2019 data.

In all cases, the definitions of the metrics SAIDI, SAIFI, MAIFI and CAIDI are consistent with the definitions provided in IEEE Standard 1366-2012.

a. The transformers serving the Valley South System normally operate electrically in parallel, so a per-transformer breakdown of the data above is not available.

   Similar to Item D but with the addition of MAIFI and CAIDI, the table below provides the reliability metrics associated with the system served by the transformers serving the Valley South System for the years 2015-2019.[2]

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[1] Reference Items D and E in the August 31, 2018 CPUC Decision 18-08-026.
[2] This data is valid as of October 2020 based on circuits identified to be part of the Valley South System at this time. Because SCE's typical distribution system operational practice includes the implementation of various distribution circuit configuration changes over time, this data may vary slightly from the corresponding data originally prepared in April 2019 and originally provided in Items D and E.

Item D - Table 1 - Service Level SAIDI Performance by Year

System	2015	2016	2017	2018	2019	5 Year Total	5 Year Average
Valley (North)	3.407	4.897	4.236	6.329	3.126	21.996	4.399
Valley (South)	2.034	3.120	3.295	2.327	3.505	14.282	2.856

Item D - Table 2 - Service Level SAIFI Performance by Year

System	2015	2016	2017	2018	2019	5 Year Total	5 Year Average
Valley (North)	0.032	0.041	0.031	0.030	0.026	0.160	0.032
Valley (South)	0.022	0.033	0.028	0.027	0.030	0.140	0.028

Service Level MAIFI Performance by Year

System	2015	2016	2017	2018	2019	5 Year Total	5 Year Average
Valley (North)	0.035	0.040	0.045	0.050	0.030	0.200	0.040
Valley (South)	0.047	0.035	0.035	0.031	0.029	0.178	0.036

Service Level CAIDI Performance by Year

System	2015	2016	2017	2018	2019	5 Year Total	5 Year Average
Valley (North)	108.020	120.211	134.693	207.633	120.707	137.379	138.253
Valley (South)	92.181	95.590	116.238	85.456	116.729	101.781	101.239

Similar to Item E, the tables below provide the breakdown of service level SAIDI performance by root cause and the total number of outages by root cause for the system served by the transformers serving the Valley South System for the years 2015-2019.

Item E - Table 1 - System Level SAIDI Performance by Root Cause from 2015 - 2019

	3rd Party	Animal	OH	Operation	Source Loss	T/S	UG	Vegetation	Weather	Other	Total SAIDI Impact
Valley South 5 Yr Avg	0.681	0.022	0.194	0.394	0.093	0.000	1.042	0.008	0.127	0.297	-
2015	0.160	0.046	0.189	0.263	0.181	0.000	0.921	0.000	0.047	0.228	2.034
2016	0.975	0.009	0.213	0.513	0.000	0.000	1.219	0.000	0.019	0.173	3.120
2017	0.515	0.026	0.144	0.423	0.000	0.000	1.266	0.004	0.204	0.714	3.295
2018	0.229	0.016	0.173	0.238	0.226	0.000	0.945	0.001	0.322	0.178	2.327
2019	1.527	0.015	0.248	0.533	0.057	0.000	0.859	0.034	0.041	0.191	3.505

Item E - Table 2 - Total Outages by Root Cause 2015-2019

	3rd Party	Animal	OH	Operation	Source Loss	T/S	UG	Vegetation	Weather	Other	Totals
Valley South 5 Yr Avg	44	15	127	238	3	0	130	1	11	68	3188
2015	28	9	68	211	2	0	101	0	11	64	494
2016	53	15	89	267	0	0	111	0	12	63	610
2017	44	14	61	233	3	0	101	2	10	57	525
2018	57	20	128	99	5	0	192	3	15	52	571
2019	36	17	288	382	5	0	145	2	9	104	988

b. SCE is interpreting this question to mean "the entire Valley South *System* (per substation)" and specifically pertaining to the data similar to Item D provided above. The data for each metric – SAIDI, SAIFI, MAIFI and CAIDI – is provided in the attached file titled "A.09-09-022 CPUC-Supplemental Data Request-006 Question DG-MISC-43b Supplemental.xlsx".

c. The SAIDI, SAIFI, MAIFI and CAIDI values for the entire SCE system for years 2015-2019 are provided in Table 1 "Total System Indices (All Interruptions Included)" of the attached file titled "A.09-09-022 CPUC-Supplemental Data Request-006 Question DG-MISC-43c Supplemental.pdf" which is an excerpt from SCE's 2019 Annual Reliability Report.

	Column Labels																				
	SAIDI					SAIFI					MAIFI					Sum of CAIDI				
Row Labels	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
VALLEY NORTH	**3.407**	**4.897**	**4.236**	**6.329**	**3.126**	**0.032**	**0.041**	**0.031**	**0.030**	**0.026**	**0.035**	**0.040**	**0.045**	**0.050**	**0.030**	**108.020**	**120.211**	**134.693**	**207.633**	**120.707**
ALESSANDRO	0.371	0.542	0.425	0.190	0.210	0.007	0.005	0.005	0.003	0.002	0.004	0.002	0.004	0.007	0.004	57.019	111.383	87.469	57.438	139.345
BUNKER	0.048	0.108	0.146	0.173	0.431	0.001	0.002	0.002	0.002	0.003	0.002	0.007	0.006	0.006	0.002	47.078	58.613	59.386	103.841	135.110
CAJALCO	0.289	0.282	0.475	0.226	0.243	0.003	0.002	0.003	0.004	0.003	0.003	0.002	0.006	0.004	0.002	86.887	113.193	140.775	54.283	90.099
GAVILAN	0.760	0.403	0.072	0.139	0.139	0.002	0.004	0.001	0.001	0.001	0.003	0.002	0.002	0.005	0.001	372.050	111.753	61.027	129.805	119.983
HEMET	0.047	0.072	0.043	0.144	0.262	0.001	0.002	0.000	0.001	0.002	0.001	0.003	0.001	0.001	0.002	87.265	45.364	138.473	197.229	157.969
IDYLLWILD	0.250	0.356	1.669	3.758	0.355	0.001	0.004	0.004	0.006	0.004	0.001	0.002	0.002	0.004	0.001	343.705	92.853	381.502	642.479	95.726
LAKEVIEW	0.000	0.024	0.039	0.057	0.139	0.000	0.001	0.000	0.001	0.000	0.000	0.002	0.000	0.001	0.001	0.000	45.107	80.970	95.729	400.157
MAYBERRY	0.279	1.656	0.323	0.269	0.608	0.002	0.006	0.004	0.003	0.005	0.004	0.006	0.007	0.006	0.006	123.949	300.485	75.579	94.186	122.576
MORENO	0.349	0.505	0.064	0.151	0.040	0.003	0.003	0.000	0.001	0.000	0.005	0.002	0.001	0.001	0.002	115.759	164.812	153.752	176.452	96.031
NELSON	0.438	0.349	0.308	0.185	0.137	0.003	0.004	0.003	0.003	0.002	0.003	0.006	0.002	0.006	0.001	173.611	78.960	117.612	69.582	59.629
OUTLAW P.T.	0.017	0.022	0.000	0.013	0.013	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	44.161	50.189	0.000	80.000	438.649
PERRIS P.T.	0.029	0.045	0.013	0.029	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	116.386	95.214	35.949	249.812	30.198
RIDGEVIEW P.T.	0.001	0.002	0.003	0.011	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	63.722	31.864	108.132	103.267	425.373
STETSON	0.242	0.223	0.542	0.545	0.220	0.003	0.003	0.005	0.005	0.002	0.008	0.003	0.009	0.004	0.003	84.827	64.882	106.392	121.089	113.205
TAHQUITZ P.T.	0.005	0.044	0.061	0.319	0.198	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	185.382	117.010	751.083	1322.482	632.541
VALLEY	0.282	0.266	0.054	0.120	0.094	0.006	0.004	0.002	0.002	0.001	0.002	0.002	0.002	0.004	0.004	46.551	62.769	34.685	75.197	63.700
VALLEY SOUTH	**2.034**	**3.120**	**3.295**	**2.327**	**3.505**	**0.022**	**0.033**	**0.028**	**0.027**	**0.030**	**0.047**	**0.035**	**0.035**	**0.031**	**0.029**	**92.181**	**95.590**	**116.238**	**85.456**	**116.729**
AULD	0.142	0.109	0.385	0.089	0.101	0.002	0.001	0.005	0.001	0.002	0.005	0.002	0.003	0.002	0.004	89.888	85.599	71.358	66.350	46.619
CALAMAR P.T.	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	43.233	0.000	16.486	160.717	95.816
CANYON LAKE	0.040	0.178	0.031	0.039	0.018	0.000	0.003	0.000	0.001	0.000	0.002	0.002	0.001	0.000	0.001	239.120	56.200	126.604	32.011	80.778
CARANCHO P.T.	0.024	0.045	0.036	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	79.284	99.137	106.072	54.593	25.954
CASCADE P.T.	0.009	0.035	0.013	0.011	0.052	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	246.550	79.572	88.936	135.227	124.614
DELUZ P.T.	0.028	0.004	0.001	0.009	0.003	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	196.744	45.393	16.489	159.577	64.949
EAGLE CREST P.T.	0.020	0.005	0.001	0.005	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	331.615	97.905	318.853	107.730	41.650
ELSINORE	0.083	0.180	0.276	0.614	0.246	0.002	0.002	0.004	0.003	0.003	0.002	0.001	0.005	0.002	0.002	40.053	73.117	69.571	186.111	84.615
ESCALA P.T.	0.000	0.005	0.013	0.001	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	111.500	71.011	36.000	99.230
FOGARTY	0.035	0.050	0.019	0.051	0.066	0.000	0.002	0.000	0.002	0.001	0.004	0.004	0.002	0.004	0.001	77.930	26.710	239.069	25.293	74.162
IVYGLEN	0.210	0.686	0.270	0.153	1.129	0.003	0.006	0.003	0.004	0.003	0.001	0.005	0.003	0.005	0.002	81.001	123.018	88.455	34.545	361.763
LACRESTA P.T.	0.035	0.028	0.018	0.003	0.039	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	148.814	113.598	74.455	36.000	105.824
MORAGA	0.198	0.569	0.126	0.169	0.320	0.002	0.004	0.001	0.002	0.003	0.004	0.001	0.003	0.002	0.001	118.312	141.407	84.733	76.697	104.963
MORAGA33	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	306.000	240.375
MURRIETTA 2	0.053	0.062	0.042	0.021	0.032	0.001	0.001	0.001	0.000	0.000	0.002	0.001	0.000	0.002	0.000	61.275	78.514	43.540	109.679	143.578
NEWCOMB	0.374	0.454	0.249	0.293	0.396	0.004	0.005	0.002	0.002	0.004	0.008	0.005	0.003	0.004	0.004	103.906	87.061	108.657	138.878	109.717
PAUBA	0.140	0.102	0.027	0.101	0.118	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.002	0.002	131.931	102.800	47.804	166.351	48.364
PECHANGA	0.158	0.126	0.270	0.182	0.252	0.002	0.002	0.002	0.002	0.003	0.004	0.001	0.006	0.002	0.001	102.686	79.291	148.773	77.563	91.539
SKYLARK	0.094	0.106	0.991	0.246	0.234	0.003	0.001	0.004	0.003	0.003	0.004	0.004	0.002	0.003	0.002	36.923	81.174	255.132	93.314	83.987
SOPHIE P.T.				0.028	0.026				0.000	0.000				0.000	0.000	0.000	0.000	0.000	64.321	77.291
STADLER	0.117	0.229	0.124	0.121	0.259	0.001	0.001	0.001	0.002	0.002	0.001	0.003	0.000	0.001	0.003	119.069	166.757	138.562	63.213	137.528
SUN CITY	0.024	0.049	0.222	0.084	0.079	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.001	0.001	0.001	205.163	107.825	224.751	78.379	50.799
TENAJA	0.131	0.029	0.119	0.013	0.004	0.001	0.001	0.001	0.000	0.000	0.003	0.003	0.002	0.000	0.000	98.005	55.291	117.304	218.355	71.771
TRITON	0.119	0.070	0.062	0.084	0.109	0.001	0.001	0.001	0.001	0.001	0.005	0.000	0.003	0.001	0.001	175.512	98.021	95.727	95.751	134.313
Grand Total	**5.441**	**8.017**	**7.531**	**8.657**	**6.631**	**0.054**	**0.073**	**0.060**	**0.058**	**0.056**	**0.083**	**0.075**	**0.080**	**0.081**	**0.058**	**101.499**	**109.259**	**125.943**	**149.981**	**118.571**

ANNUAL ELECTRIC RELIABILITY REPORT

For Year 2019

PREPARED FOR THE CALIFORNIA PUBLIC UTILITIES COMMISSION

SECTION 1 – SYSTEM INDICES FOR THE LAST 10 YEARS

a. System Indices Tables

Table 1 below contains the required SAIDI, SAIFI, MAIFI[3] 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)

	Total System Indices (All Interruptions Included)				Total System Indices (Major Event Days Excluded)			
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	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 Indices[4]

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

	Distribution Indices (< 50KV) (All Interruptions Included)				Distribution Indices (< 50KV) (Major Event Days Excluded)			
YEAR	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.

Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 9/30/2020

Question DG-MISC-47 Supplemental:
Supplemental follow-up to DG-MISC-47 from Data Request 5.

Given the geographic proximity of the Valley North and Valley South system subs, what-specific permanent load shifts were considered via tie lines?

If none were considered, why not? It appears that a number of factors may be influencing the amount of load and distributed generation in the Valley North system that may facilitate the North absorbing some of the need of the Valley South system.

Response to Question DG-MISC-47 Supplemental:

Permanent load shifts between the Valley South and Valley North Systems were studied under the four Valley South to Valley North alternatives: 1) Valley South to Valley North, 2) Valley South to Valley North plus Centralized BESS in Valley South and Valley North and 3) Valley South to Valley North plus Distributed BESS in Valley South and 4) Valley South to Valley North to Vista.

These alternatives each include subtransmission line construction to transfer the Newcomb and Sun City Substations from the Valley South System to the Valley North System. This subtransmission scope also creates system tie-lines between the two systems and allows for the transfer of these two substations between each system. SCE's approach in developing all alternatives was to transfer a sufficient amount of load to satisfy the 10-year planning criteria for the Valley South System (i.e., relieve Valley South capacity overloads for 10 years), while also constructing system tie-lines to improve reliability and resiliency. The creation of system tie-lines is a result of the permanent transfer of the Sun City and Newcomb Substations. These two substations are currently sourced by the Valley South System; the new subtransmission lines to connect them to the Valley North System become the primary source of power, while the existing lines to the Valley South System become the system tie-lines. This process of "repurposing" existing subtransmission lines as a result of system reconfigurations is the primary means for creating system tie-lines.

These two substations were specifically selected because they would allow for the minimization of 115 kV line construction, were the two closest substation to Valley Substation (important because once transferred to the Valley North System they are only able to perform routine distribution transfers with other substations in the Valley North System without first having to do a "drop and pick up" transfer), the amount of load they served would sufficiently allow for sufficient relief on the Valley South System transformers through the 10-year planning horizon, and lastly because shifting too much load from the Valley South System to the Valley North System would result in creating a loading problem in the Valley North System, thus creating a capacity need there.

While the transfer of additional substations to the Valley North System for this alternative would have provided further capacity relief to the Valley South System it would also accelerate overloads within the Valley North System and substantially increased project scope and cost. Additionally, it is important to note that the distribution substations that can be transferred have established load values and load cannot be "dialed in," rather it must occur in blocks. Instead of over-scoping the Valley South to Valley North alternative and accelerating a project in the Valley North System, SCE elected to enhance the "base" scope of the alternative to address Valley North overloads by a) transferring load to the Vista System (studied under the Valley South to Valley North to Vista alternative) and b) by adding battery energy storage systems to the Valley North System (studied under the Valley South to Valley North and Centralized BESS in Valley South and Valley North alternative).

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DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 9/30/2020

Question DG-MISC-48 Supplemental:
Supplemental follow-up to DG-MISC-48 from Data Request 5.

Were any power flow studies performed on potential tie lines between the Valley North and Valley South system? Were any other planning studies performed that focused on load shift between the north and south systems? If so, provide the studies.

Response to Question DG-MISC-48 Supplemental:

Yes, power flow studies were performed for the Valley South to Valley North alternative for N-0 conditions. These power flow simulations did not identify any line overloads in the Valley North System. N-1 and N-1-1 power flow simulations for the Valley North System were not performed since the Valley North System has system tie-lines to the Vista System which can be utilized during N-1 contingencies to roll load away from the Valley North System. The power flow models for the Valley South to Valley North alternative are provided as an attachment to data request A.09-09-022 CPUC-Supplemental Data Request-006 Q.DG-MISC-58. No other power flow or planning studies were performed.

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DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 8/11/2021

Question DG-MISC-54 Revised:
Tabulate the N-0, N-1, and N-1-1 (or N-2) contingencies that result in reliability violations at Valley South substation for all scenarios that impact downtime. Specify how this data is used in tabulating unserved MWs. Clarify whether the violation duration data used is historical SCE data or NERC statistical data. Provide this data for the:
base case
case modelling ASP
cases modelling each of the proposed alternati

Response to Question DG-MISC-54 Revised:

SCE's Second Amended Motion includes updates that impact results previously provided in this data request response. Please see the attachment titled "A.09-09-022 CPUC Supplemental Data Request-06 Q.DG-MISC-54.xlsx" which provides the updated values. The written responses and conclusions of the previous data request response for Question DG-MISC-54 are unchanged.

SCE's Second Amended Motion can be found at CPUC website https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=390886186.

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley Transformers	N-0	Basecase		22	66	103	140	177	213	250	349	447	545	644	905	1166	1428	1689	1951	2212	2606	3001	3395	3790	4184	4609	5034	5460	5885	6310
Auld to Moraga #1	N-0	Basecase																											1	1
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074												1	1	2	3	3	4	12	20	28	36	44	55	66	77	88	99
Auld to Moraga #1	N-1	Auld-Moraga #2	0.40664	0	6	12	18	24	30	36	52	69	85	101	144	188	231	274	317	361	433	506	578	651	724	800	876	952	1028	1104
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.67966																		4	9	13	17	21	30	38	46	54	62
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.67966											0	6	12	19	25	31	37	53	69	85	101	117	139	161	184	206	228
Auld to Moraga #1	N-1	Skylark-Tenaja	0.14994																						0	2	5	7	9	12
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092											0	10	20	30	40	50	60	80	101	122	143	163	194	226	257	288	319
Elsinore (Voltage Violations)	N-1	Valley-Elsinore-Fogarty	0.59092																							0	0	1	1	1
Valley EFG to Sun City	N-1	Valley-Auld #1	0.40664																		1	3	4	6	7	13	20	26	32	38
Valley EFG to Auld #1	N-1	Valley-Sun City	0.12818																							2	4	6	7	9
Valley EFG to Tap 22	N-1	Valley-Newcomb	0.21454																	0	1	3	4	6	7	14	21	28	34	41
Valley EFG to Auld #1	N-1	Valley-Auld #2	0.34884																						0	1	2	3	4	5
Valley EFG to Sun City	N-1	Valley-Auld #2	0.34884																		4	8	13	17	21	29	37	46	54	62
Multiple buses (Voltage violations)	N-1	Moraga-Pechanga	0.17578	10	14	17	20	23	26	30	36	43	50	57	68	79	90	101	112	123	138	153	168	183	199	211	224	237	249	262
Auld to Moraga #1	N-1	Valley EFG - Triton	0.53244																		10	19	29	38	48	61	73	86	98	111
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												10	20	30	39	49	59	82	104	126	149	171	203	235	267	299	331
Multiple buses (Voltage violations)	N-1	Valley EFG - Triton	0.53244	0	0	1	1	1	2	2	3	4	5	6	11	16	21	26	31	36	43	51	58	66	74	87	100	113	126	139
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	17391	20241	23092	25943	28794	31644	34495	37346	40197	43047	45898	48749	51600	54450	57301	60152	63003	65853	68704	71555	74406	77256	80107	82958	85809	88659	91510
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	13826	16249	18672	21094	23517	25940	28362	30785	33208	35630	38053	40476	42898	45321	47744	50167	52589	55012	57435	59857	62280	64703	67125	69548	71971	74393	76816
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	11056	13012	14967	16922	18877	20833	22788	24743	26698	28653	30609	32564	34519	36474	38430	40385	42340	44295	46250	48206	50161	52116	54071	56027	57982	59937	61892
Auld to Moraga #1	N-2	Auld-Moraga #2 & Pauba-Triton	0.01944	10980	12736	14492	16247	18003	19759	21514	23270	25026	26782	28537	30293	32049	33805	35560	37316	39072	40828	42583	44339	46095	47851	49606	51362	53118	54874	56629
Valley EFG to Sun City	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	734	2176	3618	5059	6501	7943	9384	10826	12268	13710	15151	16593	18035	19476	20918	22360	23802	25243	26685	28127	29568	31010	32452	33893	35335	36777	38219
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	557	1961	3365	4769	6172	7576	8980	10384	11787	13191	14595	15999	17402	18806	20210	21614	23017	24421	25825	27229	28632	30036	31440	32844	34247	35651	37055
Sun City to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		845	1691	2536	3381	4227	5072	5917	6762	7608	8453	9298	10144	10989	11834	12680	13525	14370	15216	16061	16906	17752	18597	19442	20287	21133	21978
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		794	1589	2383	3177	3972	4766	5561	6355	7149	7944	8738	9532	10327	11121	11916	12710	13504	14299	15093	15887	16682	17476	18271	19065	19859	20654
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		779	1558	2337	3116	3895	4673	5452	6231	7010	7789	8568	9347	10126	10905	11684	12463	13242	14020	14799	15578	16357	17136	17915	18694	19473	20252
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		767	1533	2300	3067	3833	4600	5367	6134	6900	7667	8434	9200	9967	10734	11500	12267	13034	13801	14567	15334	16101	16867	17634	18401	19167	19934
Tap 39 to Elsinore	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		665	1330	1995	2660	3325	3990	4655	5320	5985	6650	7315	7980	8645	9310	9975	10640	11305	11969	12634	13299	13964	14629	15294	15959	16624	17289
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		577	1154	1731	2308	2885	3463	4040	4617	5194	5771	6348	6925	7502	8079	8656	9233	9810	10388	10965	11542	12119	12696	13273	13850	14427	15004
Valley EFG to Auld #1	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		542	1084	1627	2169	2711	3253	3795	4338	4880	5422	5964	6506	7049	7591	8133	8675	9217	9759	10302	10844	11386	11928	12470	13013	13555	14097
Valley EFG to Auld #2	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		309	619	928	1238	1547	1857	2166	2476	2785	3094	3404	3713	4023	4332	4642	4951	5261	5570	5879	6189	6498	6808	7117	7427	7736	8046
Valley EFG to Tap 39	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		285	570	855	1140	1425	1710	1995	2280	2565	2850	3135	3420	3705	3990	4275	4560	4845	5130	5415	5700	5985	6270	6555	6840	7125	7410
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		214	428	642	856	1070	1283	1497	1711	1925	2139	2353	2567	2781	2995	3209	3422	3636	3850	4064	4278	4492	4706	4920	5134	5348	5562
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		132	265	397	529	662	794	926	1059	1191	1323	1456	1588	1721	1853	1985	2118	2250	2382	2515	2647	2779	2912	3044	3176	3309	3441
Auld to Moraga #1	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		127	253	380	506	633	760	886	1013	1139	1266	1393	1519	1646	1772	1899	2026	2152	2279	2405	2532	2659	2785	2912	3039	3165	3292
Skylark to Tenaja	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		77	155	232	309	386	464	541	618	696	773	850	927	1005	1082	1159	1237	1314	1391	1468	1546	1623	1700	1778	1855	1932	2009
Valley EFG to Auld	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		60	121	181	241	302	362	423	483	543	604	664	724	785	845	905	966	1026	1086	1147	1207	1268	1328	1388	1449	1509	1569
Skylark to Tenaja	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984		44	89	133	177	222	266	310	354	399	443	487	532	576	620	665	709	753	798	842	886	931	975	1019	1063	1108	1152
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		31	62	93	124	155	185	216	247	278	309	340	371	402	433	464	495	526	556	587	618	649	680	711	742	773	804
Auld to Moraga #1	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088		23	46	68	91	114	137	160	183	205	228	251	274	297	319	342	365	388	411	434	456	479	502	525	548	570	593
Skylark to Tap 22	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		14	29	43	58	72	87	101	115	130	144	159	173	188	202	216	231	245	260	274	289	303	317	332	346	361	375
Tap 39 to Elsinore	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		9	19	28	37	46	56	65	74	83	93	102	111	121	130	139	148	158	167	176	185	195	204	213	223	232	241
Valley EFG to Sun City	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		5	10	15	19	24	29	34	39	44	49	53	58	63	68	73	78	83	87	92	97	102	107	112	117	121	126
Skylark to Tap 22	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		4	9	13	17	21	26	30	34	38	43	47	51	56	60	64	68	73	77	81	85	90	94	98	102	107	111
Valley EFG to Auld #2	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		4	8	11	15	19	23	27	31	34	38	42	46	50	54	57	61	65	69	73	77	80	84	88	92	96	100
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088		4	7	11	14	18	21	25	28	32	35	39	42	46	49	53	57	60	64	67	71	74	78	81	85	88	92
Valley EFG to Tap 39	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		2	5	7	9	12	14	16	19	21	24	26	28	31	33	35	38	40	42	45	47	49	52	54	57	59	61
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	55753	59950	61896	64094	66700	69417	72331	75927	79466	83209	87330	91605	96303	100662	105723	110256	115253	120060	124561	129016	133845	138011	142233	146087	149937	153030	155780

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Alberhill to Fogarty	N-0	Basecase																										1	2	3
Alberhill to Fogarty	N-1	Alberhill-Skylark	0.4165																	21	33	45	56	68	80	95	110	125	140	155
Alberhill to Skylark	N-1	Alberhill – Fogarty	0.1734																						4	9	14	19	25	30
Auld to Moraga #1	N-1	Valley EFG-Newcomb-Tenaja	0.69122																											18
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	0	2189	5378	8567	11756	14945	18134	21323	24512	27701	30890	34079	37268	40457	43646	46835	50024	53213	56402	59591	62780	65969	69158	72347	75535	78724	82913
Auld to Moraga #1	N-2	Auld-Moraga #2 & Pauba-Triton	0.01944	0	1967	4035	6102	8169	10237	12304	14371	16439	18506	20573	22641	24708	26775	28843	30910	32978	35045	37112	39180	41247	43314	45382	47449	49516	51584	53751
	Flex-2-1		0.01	30328	32684	33845	35066	36381	37930	39532	41561	43686	45959	48325	50771	53288	55808	58421	61122	63922	66552	69215	71896	74631	77006	79348	81638	83894	85625	87217
	Flex-2-2		0.0015	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	23	32	41	65	77	89	100

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley Transformers	N-0	Basecase		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	41	61	82	106	130	155	179	244
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	24	30	36	42	48	55	61	67	73	79	85	111	98	104	110	116	139	128	134	141	147	167	159	165	171	177	185
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	8419	10307	12424	14542	16659	18777	20975	23012	25130	27247	29365	31502	33600	35718	37835	39953	42087	44188	46306	48423	50541	52672	54776	56893	59011	61129	63287
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	6649	8368	10087	11837	13526	15245	17029	18684	20403	22122	23841	25580	27280	28999	30719	32438	34174	35876	37596	39315	41034	42767	44473	46192	47911	49631	51383
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	2104	2648	3192	3736	4080	4824	5389	5912	6456	7001	7545	8108	8633	9177	9721	10265	10826	11353	11897	12441	12985	13543	14073	14617	15161	15705	16261
Tap 39 to Elsinore	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	1649	2075	2502	2928	3354	3781	4224	4633	5060	5486	5912	6358	6765	7191	7618	8044	8487	8897	9323	9750	10176	10616	11029	11455	11881	12308	12743
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	836	1052	1268	1485	1701	1917	2142	2349	2566	2782	2998	3234	3430	3647	3863	4079	4312	4511	4727	4944	5160	5390	5592	5808	6025	6241	6458
Valley EFG to Auld #1	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	525	661	797	932	1068	1204	1345	1475	1611	1747	1883	2038	2154	2290	2426	2561	2714	2833	2969	3104	3240	3390	3512	3647	3783	3919	4056
Valley EFG to Auld #2	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	25	31	38	44	50	57	64	70	76	82	89	115	102	108	114	121	144	134	140	146	153	173	166	172	178	185	192
Valley EFG to Tap 39	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	600	756	911	1066	1221	1376	1532	1687	1842	1997	2153	2327	2463	2618	2773	2929	3101	3239	3394	3550	3705	3874	4015	4170	4326	4481	4637
	Flex-2-1		0.01	395042	413733	422871	432399	442578	454449	466537	481805	497699	514701	532357	550717	569834	588989	608808	629264	650443	670294	690487	710906	731709	749733	767559	785021	802235	815401	827505
	Flex-2-2		0.0015	11166	12530	13238	13870	14790	15713	16573	17873	19301	20954	22638	24142	25813	27568	29310	31218	33221	35148	37153	39240	41562	43338	45386	46983	48557	50204	51564

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley South Transformers	N-0	Basecase																						4	27	49	72	94	116
Valley North Transformers	N-0	Basecase																	8	136	264	392	519	647	775	1007	1239	1472	1704	2564
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074													3	5	8	10	13	25	37	49	61	73	88	103	118	133	147
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366																		2	3	5	7	9	15	21	28	34	40
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366													4	7	11	14	18	31	43	56	68	81	97	113	130	146	162
Moraga to Tap 150 #1	N-1	Skylark-Tenaja	0.14994																											1
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092													4	8	13	17	21	35	48	62	75	89	107	124	142	159	177
Multiple buses (Voltage violations)	N-1	Moraga - Pechanga	0.17578																		13	26	39	52	65	94	122	151	179	208
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												3.5	13	23	32	42	51	72	93	114	134	155	185	216	246	276	307
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553	9518	11283	13447	15412	17377	19445	21306	23271	25235	27200	29192	31130	33094	35059	37024	39010	40953	42918	44882	46847	48828	50776	52741	54706	56670	58673
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2881	3486	4205	4925	5644	6364	7122	7803	8523	9242	9962	10708	11401	12120	12840	13559	14301	14998	15718	16437	17157	17893	18596	19316	20035	20755	21488
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2944	3565	4301	5037	5773	6509	7284	7981	8717	9453	10189	10952	11661	12397	13132	13868	14626	15340	16076	16812	17548	18301	19020	19756	20492	21228	21978
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405	2887	3483	4078	4674	5270	5897	6462	7058	7653	8249	8872	9441	10037	10633	11229	11846	12420	13016	13612	14208	14820	15399	15995	16591	17187	17795
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2554	3219	3883	4548	5212	5877	6576	7205	7870	8534	9199	9890	10527	11192	11856	12521	13207	13850	14514	15178	15843	16524	17172	17836	18500	19165	19842
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2319	2922	3525	4128	4732	5335	5970	6541	7144	7747	8350	8981	9557	10160	10763	11366	11991	12573	13176	13779	14382	15002	15588	16191	16795	17398	18013
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	426	536	647	758	869	979	1096	1201	1312	1422	1533	1671	1755	1865	1976	2087	2219	2308	2419	2530	2640	2768	2862	2973	3083	3194	3307
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	248	312	377	441	506	570	638	699	764	828	893	984	1021	1086	1150	1215	1301	1344	1408	1473	1537	1619	1666	1731	1795	1860	1925
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088	9	11	13	16	18	20	23	25	27	30	32	61	37	39	41	43	68	48	50	53	55	74	60	62	64	67	69
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814	26616	28305	30267	32347	34250	36508	38785	41361	43640	46028	48087	50731	52806	54821	56763	58849	60400	61787

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley South Transformers	N-0	Basecase																						4	27	49	72	94	116
Valley North Transformers	N-0	Basecase																					26	52	78	210	341	472	604	735
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074													3	5	8	10	13	25	37	49	61	73	88	103	118	133	147
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366																		2	3	5	7	9	15	21	28	34	40
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366													4	7	11	14	18	31	43	56	68	81	97	113	130	146	162
Moraga to Tap 150 #1	N-1	Skylark-Tenaja	0.14994																											1
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092													4	8	13	17	21	35	48	62	75	89	107	124	142	159	177
Multiple buses (Voltage violations)	N-1	Moraga - Pechanga	0.17578																		13	26	39	52	65	94	122	151	179	208
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												3.5	13	23	32	42	51	72	93	114	134	155	185	216	246	276	307
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553	9518	11283	13447	15412	17377	19445	21306	23271	25235	27200	29192	31130	33094	35059	37024	39010	40953	42918	44882	46847	48828	50776	52741	54706	56670	58673
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2881	3486	4205	4925	5644	6364	7122	7803	8523	9242	9962	10708	11401	12120	12840	13559	14301	14998	15718	16437	17157	17893	18596	19316	20035	20755	21488
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2944	3565	4301	5037	5773	6509	7284	7981	8717	9453	10189	10952	11661	12397	13132	13868	14626	15340	16076	16812	17548	18301	19020	19756	20492	21228	21978
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405	2887	3483	4078	4674	5270	5897	6462	7058	7653	8249	8872	9441	10037	10633	11229	11846	12420	13016	13612	14208	14820	15399	15995	16591	17187	17795
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2554	3219	3883	4548	5212	5877	6576	7205	7870	8534	9199	9890	10527	11192	11856	12521	13207	13850	14514	15178	15843	16524	17172	17836	18500	19165	19842
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2319	2922	3525	4128	4732	5335	5970	6541	7144	7747	8350	8981	9557	10160	10763	11366	11991	12573	13176	13779	14382	15002	15588	16191	16795	17398	18013
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	426	536	647	758	869	979	1096	1201	1312	1422	1533	1671	1755	1865	1976	2087	2219	2308	2419	2530	2640	2768	2862	2973	3083	3194	3307
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	248	312	377	441	506	570	638	699	764	828	893	984	1021	1086	1150	1215	1301	1344	1408	1473	1537	1619	1666	1731	1795	1860	1925
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088	9	11	13	16	18	20	23	25	27	30	32	61	37	39	41	43	68	48	50	53	55	74	60	62	64	67	69
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814	26616	28305	30267	32347	34250	36508	38785	41361	43640	46028	48087	50731	52806	54821	56763	58849	60400	61787

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley South Transformers	N-0	Basecase																				18.05	36.1	54.15	72.2	104.12	136.04	167.96	199.88	231.8
Auld to Moraga #1	N-1	Auld-Moraga #2	0.40664													1.04	2.08	3.12	4.16	5.2	14	24	33	42	51.4	64	76	88	100	112.2
Voltage Violations (multiple buses)	N-1	Moraga - Pechanga	0.17578							12.5	16	20	23	27	30	39	47	56	64	72.5	80	87	94	101	107.5	119	130	141	152	162.5
Valley EFG - Triton	N-1	Moraga - Pechanga	0.17578																							1.28	2.56	3.84	5.12	6.4
Auld to Moraga #1	N-1	Valley EFG - Triton	0.53244																							0.7	1.4	2.1	2.8	3.5
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244							0	1.06	2.12	3.18	4.24	5.3	15	24	33	43	52.2	73	93	113	134	154.2	182	210	238	266	293.6
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	12012	15421	18577	21733	26889	28046	31202	34358	37514	40670	43826	46982	50138	53295	56451	59607	63763	65919	69075	72231	75387	78544	81700	84856	86012	88590	91168
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	9460	11894	14328	16763	19197	21631	24066	26500	28934	31369	33803	36237	38671	41106	43540	45974	48409	50843	53277	55712	58146	60580	63014	65449	66883	69100	71317
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7738	9730	11721	13712	15704	17695	19686	21678	23669	25660	27652	29643	31634	33625	35617	37608	39599	41591	43582	45573	47565	49556	51547	53539	55530	56026	56521
Auld to Moraga #1	N-2	Auld-Moraga #2 & Pauba-Triton	0.01944	6434	8090	9746	11401	13057	14713	16368	18024	19680	21335	22991	24647	26303	27958	29614	31270	32925	34581	36237	37892	39548	41204	42860	44515	46171	46999	47827
Valley EFG to Sun City	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4582	5761	6940	8119	9298	10476	11655	12834	14013	15192	16371	17550	18729	19908	21087	22266	23445	24624	25803	26982	28161	29340	30519	31698	32877	33467	34056
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4523	5688	6852	8016	9180	10344	11508	12672	13836	15000	16164	17328	18492	19656	20820	21984	23148	24312	25476	26640	27804	28968	30132	31296	32460	33042	33624
Sun City to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2736	3441	4145	4849	5553	6257	6961	7666	8370	9074	9778	10482	11187	11891	12595	13299	14003	14707	15412	16116	16820	17524	18228	18932	19637	19989	20341
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	2499	3142	3785	4428	5071	5714	6357	7000	7643	8286	8929	9572	10215	10858	11501	12144	12787	13430	14073	14716	15359	16002	16645	17288	17931	18252	18574
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2499	3142	3785	4428	5071	5714	6357	7000	7643	8286	8929	9572	10215	10858	11501	12144	12787	13430	14073	14716	15359	16002	16645	17288	17931	18252	18574
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2453	3084	3715	4347	4978	5609	6240	6871	7503	8134	8765	9396	10027	10659	11290	11921	12552	13183	13815	14446	15077	15708	16339	16971	17602	17917	18233
Auld to Moraga #1	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	854	1073	1293	1513	1733	1952	2172	2392	2611	2831	3051	3270	3490	3710	3929	4149	4369	4589	4808	5028	5248	5467	5687	5907	6126	6236	6346
Valley EFG to Sun City	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	11	14	17	19	22	25	28	31	33	36	39	42	45	47	50	53	56	59	62	64	67	70	73	76	78	80	81
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088	85	107	128	150	172	194	216	237	259	281	303	325	347	368	390	412	434	456	477	499	521	543	565	586	608	619	630
	Flex-2-1		0.01	370704	388223	396740	405647	415200	426375	437757	452100	467026	483013	499606	516818	534727	552669	571230	590386	610260	628907	647898	667193	686889	703958	720868	737452	753800	766304	777797
	Flex-2-2		0.0015	8981	10063	10674	11220	11983	12749	13523	14641	15813	16958	18467	20048	21808	23192	24700	26431	28110	29779	31639	33283	35159	36849	38439	40250	42072	43205	44419

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	8046	9660	9699	11352	13005	14658	16311	17964	19617	21270	22924	24577	26230	27883	29536	31189	32842	34495	36148	37801	39454	41107	42760	44413	46066	47719	49372
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	6662	7024	8467	9910	11353	12796	14239	15682	17125	18568	20011	21454	22897	24340	25783	27226	28669	30112	31555	32998	34441	35884	37328	38771	40214	41657	43100
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	5357	5400	6509	7618	8728	9837	10947	12056	13165	14275	15384	16493	17603	18712	19822	20931	22040	23150	24259	25369	26478	27587	28697	29806	30915	32025	33134
Auld to Moraga #1	N-2	Auld-Moraga #2 & Pauba-Triton	0.01944	5335	5117	6168	7219	8271	9322	10373	11424	12476	13527	14578	15629	16681	17732	18783	19835	20886	21937	22988	24040	25091	26142	27193	28245	29296	30347	31398
Valley EFG to Sun City	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	634	2081	2508	2935	3363	3790	4218	4645	5073	5500	5928	6355	6783	7210	7637	8065	8492	8920	9347	9775	10202	10630	11057	11485	11912	12339	12767
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	457	1866	2249	2632	3016	3399	3782	4166	4549	4932	5316	5699	6082	6466	6849	7232	7616	7999	8382	8766	9149	9532	9915	10299	10682	11065	11449
Sun City to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		458	1758	2057	2357	2656	2956	3255	3555	3854	4154	4453	4753	5052	5352	5652	5951	6251	6550	6850	7149	7449	7748	8048	8347	8647	8947
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		370	1652	1933	2215	2496	2778	3059	3341	3622	3904	4185	4467	4748	5030	5311	5592	5874	6155	6437	6718	7000	7281	7563	7844	8126	8407
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		343	1619	1895	2171	2448	2724	3000	3276	3552	3828	4104	4380	4656	4932	5208	5484	5760	6036	6312	6588	6864	7140	7416	7692	7968	8244
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		322	1594	1866	2137	2409	2681	2952	3224	3496	3768	4039	4311	4583	4854	5126	5398	5669	5941	6213	6484	6756	7028	7299	7571	7843	8114
Tap 39 to Elsinore	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		1147	1383	1618	1854	2089	2325	2561	2796	3032	3268	3503	3739	3975	4210	4446	4681	4917	5153	5388	5624	5860	6095	6331	6567	6802	7038
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		995	1200	1404	1609	1813	2018	2222	2427	2631	2836	3040	3245	3449	3654	3858	4063	4267	4472	4676	4881	5085	5290	5494	5699	5903	6108
Valley EFG to Auld #1	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		935	1127	1319	1512	1704	1896	2088	2280	2472	2664	2856	3049	3241	3433	3625	3817	4009	4201	4394	4586	4778	4970	5162	5354	5546	5738
Valley EFG to Auld #2	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		534	643	753	863	972	1082	1192	1301	1411	1521	1630	1740	1850	1959	2069	2179	2288	2398	2508	2617	2727	2836	2946	3056	3165	3275
Valley EFG to Tap 39	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		492	593	694	795	896	997	1098	1199	1300	1401	1502	1603	1704	1805	1906	2006	2107	2208	2309	2410	2511	2612	2713	2814	2915	3016
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		369	445	521	596	672	748	824	900	975	1051	1127	1203	1279	1354	1430	1506	1582	1658	1733	1809	1885	1961	2036	2112	2188	2264
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		228	275	322	369	416	463	510	557	603	650	697	744	791	838	885	932	979	1026	1072	1119	1166	1213	1260	1307	1354	1401
Auld to Moraga #1	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		218	263	308	353	398	443	488	532	577	622	667	712	757	802	846	891	936	981	1026	1071	1116	1160	1205	1250	1295	1340
Skylark to Tenaja	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		133	161	188	215	243	270	298	325	352	380	407	435	462	489	517	544	572	599	626	654	681	708	736	763	791	818
Valley EFG to Auld	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		104	125	147	168	190	211	232	254	275	297	318	339	361	382	404	425	446	468	489	510	532	553	575	596	617	639
Skylark to Tenaja	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984		76	92	108	124	139	155	171	186	202	218	233	249	265	281	296	312	328	343	359	375	390	406	422	438	453	469
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096		53	64	75	86	97	108	119	130	141	152	163	174	185	196	207	218	229	240	251	261	272	283	294	305	316	327
Auld to Moraga #1	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088		39	47	56	64	72	80	88	96	104	112	120	128	136	144	153	161	169	177	185	193	201	209	217	225	233	242
Skylark to Tap 22	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		25	30	35	40	45	50	56	61	66	71	76	81	86	91	96	102	107	112	117	122	127	132	137	142	148	153
Tap 39 to Elsinore	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		16	19	23	26	29	32	36	39	42	46	49	52	55	59	62	65	69	72	75	78	82	85	88	92	95	98
Valley EFG to Sun City	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		8	10	12	14	15	17	19	20	22	24	26	27	29	31	32	34	36	38	39	41	43	45	46	48	50	51
Skylark to Tap 22	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016		7	9	10	12	13	15	16	18	19	21	22	24	26	27	29	30	32	33	35	36	38	39	41	42	44	45
Valley EFG to Auld #2	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304		7	8	9	11	12	13	15	16	17	19	20	22	23	24	26	27	28	30	31	32	34	35	36	38	39	41
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088		6	7	9	10	11	12	14	15	16	17	19	20	21	22	24	25	26	27	29	30	31	32	34	35	36	37
Valley EFG to Tap 39	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696		4	5	6	7	7	8	9	10	11	12	12	13	14	15	16	17	17	18	19	20	21	22	22	23	24	25
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	55732	59885	61805	63975	66548	69219	72077	75596	79049	82692	86684	90805	95299	99405	104175	108406	113060	117519	121660	125728	130131	133893	137692	141096	144476	147204	149603

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Auld to Moraga #1	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	138	173	209	244	280	316	354	387	423	458	494	530	565	601	637	672	708	744	779	815	851	886	922	957	993	1029	1068
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	6993	8806	10519	12433	14246	16059	17999	19685	21498	23311	25124	26937	28750	30563	32377	34190	36003	37816	39629	41442	43255	45068	46881	48694	50507	52320	54310
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	5539	6975	8412	9848	11284	12720	14257	15592	17028	18465	19901	21337	22773	24209	25645	27081	28517	29954	31390	32826	34262	35698	37134	38570	40007	41443	43018
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	1932	2266	2733	3199	3666	4132	4631	5065	5532	5998	6465	6931	7398	7864	8331	8797	9264	9730	10197	10664	11130	11597	12063	12530	12996	13463	13975
Tap 39 to Elsinore	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	1483	1700	2050	2400	2750	3100	3474	3800	4150	4500	4850	5200	5550	5900	6250	6600	6950	7300	7650	8000	8350	8700	9050	9400	9750	10100	10484
Valley EFG to Tap 39	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	530	667	805	942	1079	1217	1364	1491	1629	1766	1903	2041	2178	2316	2453	2590	2728	2865	3002	3140	3277	3414	3552	3689	3827	3964	4115
Valley EFG to Tap 39	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	143.4	180.6	217.8	255.0	292.2	329.3	369.1	403.7	440.9	478.1	515.3	552.4	589.6	626.8	664.0	701.2	738.4	775.6	812.7	849.9	887.1	924.3	961.5	998.7	1035.8	1073.0	1113.8
Tap 39 to Elsinore	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	2.5	3.1	3.7	4.4	5.0	5.7	6.3	6.9	7.6	8.2	8.9	9.4	10.1	10.8	11.4	12.0	12.7	13.3	14.0	14.6	15.2	15.9	16.5	17.2	17.8	18.4	19.1
	Flex-2-1		0.01	395042	413733	422871	432399	442578	454449	466537	481805	497699	514701	532357	550717	569834	588989	608808	629264	650443	670294	690487	710906	731709	749733	767559	785021	802235	815401	827505
	Flex-2-2		0.0015	11166	12530	13238	13870	14790	15713	16573	17873	19301	20954	22638	24142	25813	27568	29310	31218	33221	35148	37153	39240	41562	43338	45386	46983	48557	50204	51564

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley South Transformers	N-0	Basecase																						4	27	49	72	94	116
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074													3	5	8	10	13	25	37	49	61	73	88	103	118	133	147
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366																		2	3	5	7	9	15	21	28	34	40
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366													4	7	11	14	18	31	43	56	68	81	97	113	130	146	162
Moraga to Tap 150 #1	N-1	Skylark-Tenaja	0.14994																										1
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092													4	8	13	17	21	35	48	62	75	89	107	124	142	159	177
Multiple buses (Voltage violations)	N-1	Moraga - Pechanga	0.17578																		13	26	39	52	65	94	122	151	179	208
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												3.5	13	23	32	42	51	72	93	114	134	155	185	216	246	276	307
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553	9518	11283	13447	15412	17377	19445	21306	23271	25235	27200	29192	31130	33094	35059	37024	39010	40953	42918	44882	46847	48828	50776	52741	54706	56670	58673
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2881	3486	4205	4925	5644	6364	7122	7803	8523	9242	9962	10708	11401	12120	12840	13559	14301	14998	15718	16437	17157	17893	18596	19316	20035	20755	21488
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2944	3565	4301	5037	5773	6509	7284	7981	8717	9453	10189	10952	11661	12397	13132	13868	14626	15340	16076	16812	17548	18301	19020	19756	20492	21228	21978
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405	2887	3483	4078	4674	5270	5897	6462	7058	7653	8249	8872	9441	10037	10633	11229	11846	12420	13016	13612	14208	14820	15399	15995	16591	17187	17795
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2554	3219	3883	4548	5212	5877	6576	7205	7870	8534	9199	9890	10527	11192	11856	12521	13207	13850	14514	15178	15843	16524	17172	17836	18500	19165	19842
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2319	2922	3525	4128	4732	5335	5970	6541	7144	7747	8350	8981	9557	10160	10763	11366	11991	12573	13176	13779	14382	15002	15588	16191	16795	17398	18013
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	426	536	647	758	869	979	1096	1201	1312	1422	1533	1671	1755	1865	1976	2087	2219	2308	2419	2530	2640	2768	2862	2973	3083	3194	3307
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	248	312	377	441	506	570	638	699	764	828	893	984	1021	1086	1150	1215	1301	1344	1408	1473	1537	1619	1666	1731	1795	1860	1925
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088	9	11	13	16	18	20	23	25	27	30	32	61	37	39	41	43	68	48	50	53	55	74	60	62	64	67	69
	Flex-2-1		0.01	632669	661848	675954	690610	706172	724199	742386	765107	788471	813139	838366	864142	890472	916371	942719	969423	996595	1021601	1046648	1071624	1096696	1118138	1139083	1159361	1179104	1194054	1207691
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814	26616	28305	30267	32347	34250	36508	38785	41361	43640	46028	48087	50731	52806	54821	56763	58849	60400	61787

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley North Transformers	N-0	Basecase																	8	136	264	392	519	647	775	1007	1239	1472	1704	2564
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074													3	5	8	10	13	25	37	49	61	62	74	86	99	113	125
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366													0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366													4	7	11	14	18	31	43	56	68	63	74	84	94	105	115
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092													4	8	13	17	21	35	48	62	75	59	69	79	89	100	110
Multiple buses (Voltage violations)	N-1	Moraga - Pechanga	0.17578																		13	26	39	52	10	12	13	15	16	18
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												3.5	13	23	32	42	51	72	93	114	134	131	154	177	200	223	246
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553	9243	10933	12623	14313	16004	17825	20117	22718	24489	25259	27030	29800	32071	34341	35112	36883	38653	39424	41194	42965	44735	46506	48277	50047	51818	53588
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2881	3349	3817	4284	4752	5220	5310	6262	6836	7409	7983	8557	9131	9633	10135	10637	11140	11642	12144	12522	12899	13276	13654	14031	14408	14786	15163
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2944	3526	4108	4690	5271	5853	6257	7017	7599	8181	8763	9344	9926	10508	11090	11672	12254	12836	13418	13999	14581	15163	15745	16327	16909	17491	18072
Tap 39 to Elsinore	N-2	Valley-Sun City\Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405	2131	2617	3104	3590	4076	4385	5023	5483	5944	6404	6864	7324	7785	8269	8730	9191	9652	10113	10574	11034	11495	11955	12416	12876	13336	13768
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld Triton	0.02696	2554	2401	2890	3379	3867	4356	4666	5333	5822	6310	6799	7288	7776	8265	8777	9267	9756	10246	10735	11224	11713	12202	12691	13180	13668	14157	14618
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld Triton	0.02696	248	291	334	405	524	643	584	839	916	993	1070	1143	1219	1296	1373	1449	1526	1603	1680	1756	1833	1910	1987	2064	2141	2217	2300
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2319	2375	2777	3180	3583	3985	4210	5072	5273	5716	6158	6601	7043	7486	7940	8383	8826	9269	9712	10155	10597	11040	11483	11926	12368	12811	13240
Valley EFG to Tap 39	N-2	Valley-Sun City\Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	426	561	697	832	968	1104	1061	1375	1510	1646	1782	1917	2053	2188	2324	2459	2595	2731	2866	3002	3137	3273	3409	3544	3680	3815	3837
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814	26616	28305	30267	32347	34250	36508	38785	41361	43640	46028	48087	50731	52804	54806	56734	58797	60328	61787

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley South Transformers	N-0	Basecase											17.9	36	82	129	175	221	268	314	413	511	610	708	807	1026	1246	1466	1685	1905
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074											0	0	0	0	1	1	1	5	10	15	19	24	38	53	67	81	95
Valley EFG to Tap 39 #1	N-1	Valley EFGNewcomb-Skylark	0.67966											0	3	5	8	10	13	16	28	41	53	66	79	91	104	116	129	141
Tap 39 to Elsinore #1	N-1	Valley EFGNewcomb-Skylark	0.67966											0	3	5	8	11	14	16	29	41	53	65	77	90	102	115	127	139
Ivyglen (Voltage Violation)	N-1	Fogarty-Ivyglen	0.32164																		2	3	5	6	8	9	10	11	12	13
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.48688							0	0.65	1.3	1.95	2	9	15	21	28	34	41	61	81	102	122	142	174	207	239	271	303
Pechanga (Voltage Violations)	N-1	Moraga-Pechanga	0.17578																		2	4	6	8	10	12	13	15	16	18
Valley EFG to Sun City	N-1	Valley-Auld #1	0.40664																		1	3	4	5	7	13	19	25	31	37
Valley EFG to Auld #1	N-1	Valley-Sun City	0.12818																						0	2	4	6	7	9
Valley EFG to Tap 22#1	N-1	Valley-Newcomb	0.21454											0							1	2	3	4	4	10	16	22	28	34
Valley EFG to Auld #1	N-1	Valley-Auld #2	0.34884																						0	1	1	2	3	3
Valley EFG to Sun City	N-1	Valley-Auld #2	0.34884											0							4	7	11	14	18	26	34	43	51	60
Moraga to Pechanga	N-1	Valley EFG - Triton	0.53244											0.2	4	7	10	14	17	21	41	62	83	103	124	159	194	229	265	300
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	9974	12545	15116	17687	20258	22829	25458	27970	30541	33112	35683	38265	40824	43395	45966	48537	51115	53679	56249	58820	61391	63966	66533	69104	71674	74245	76816
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	8037	10108	12179	14251	16322	18393	20512	22536	24608	26679	28750	30833	32893	34964	37036	39107	41186	43250	45321	47393	49464	51539	53607	55678	57750	59821	61892
Valley EFG to Sun City	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4963	6242	7521	8800	10079	11358	12666	13916	15195	16474	17753	19044	20312	21591	22870	24149	25435	26707	27986	29265	30544	31827	33102	34381	35660	36940	38219
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4812	6052	7292	8532	9772	11012	12281	13492	14733	15973	17213	18464	19693	20933	22173	23414	24661	25894	27134	28374	29614	30858	32094	33335	34575	35815	37055
Sun City to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	3152	3589	4325	5060	5796	6532	7284	8003	8738	9474	10209	10956	11680	12416	13151	13887	14630	15358	16094	16829	17565	18304	19036	19771	20507	21243	21978
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2630	3307	3985	4663	5341	6019	6712	7374	8052	8730	9407	10097	10763	11441	12119	12796	13482	14152	14830	15507	16185	16867	17541	18219	18896	19574	20252
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2588	3256	3923	4590	5257	5924	6606	7258	7926	8593	9260	9938	10594	11261	11928	12596	13270	13930	14597	15264	15931	16602	17266	17933	18600	19267	19934
Valley EFG to Auld #1	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	1830	2302	2774	3246	3718	4189	4672	5133	5605	6077	6548	7032	7492	7964	8436	8907	9387	9851	10323	10795	11266	11742	12210	12682	13153	13625	14097
Valley EFG to Auld #2	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	1045	1314	1583	1853	2122	2391	2666	2930	3199	3468	3737	4018	4276	4545	4814	5084	5361	5622	5891	6161	6430	6703	6969	7238	7507	7776	8046
Valley EFG to Auld	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	204	256	309	361	414	466	520	571	624	676	729	793	834	887	939	992	1052	1097	1149	1202	1254	1311	1359	1412	1464	1517	1569
Skylark to Tap 22	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	49	61	74	86	99	111	124	137	149	162	174	198	199	212	224	237	257	262	275	287	300	316	325	337	350	363	375
Valley EFG to Sun City	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	16	21	25	29	33	38	42	46	50	54	59	74	67	71	76	80	92	88	92	97	101	109	109	114	118	122	126
Skylark to Tap 22	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	14	18	22	26	29	33	37	40	44	48	52	67	59	63	66	70	81	78	81	85	89	96	96	100	104	107	111
Valley EFG to Auld #2	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	13	16	20	23	26	30	33	36	40	43	46	61	53	56	60	63	74	70	73	76	80	87	86	90	93	96	100
Valley EFG to Triton	N-2	Auld-Moraga #2 & Moraga-Pechanga	0.0088	9	12	14	17	19	22	24	26	29	31	34	48	39	41	44	46	56	51	53	56	58	64	63	65	68	70	73
	Flex-2-1		0.01	2146216	2183888	2201776	2220157	2239489	2261652	2283812	2311205	2339071	2368206	2397723	2427633	2457986	2487626	2517525	2547619	2578055	2605932	2633734	2661374	2689036	2712646	2735683	2757974	2779664	2796081	2811049
	Flex-2-2		0.0015	16952	18977	20048	21063	22275	23415	24608	26296	27942	29789	31867	33856	36119	38347	40865	43370	46050	48161	50853	53288	55832	57848	60236	62300	64511	66530	68008

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.48688																						0	0.54	1.08	1.62	2.16	2.7
Ivyglen (Voltage Violations)	N-1	Fogarty-Ivyglen	0.32164																		1	2	3	4	5	7	8	10	11	13
Valley EFG to Sun City	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	9970	12541	15112	17683	20254	22825	25458	27967	30538	33109	35680	38251	40822	43393	45964	48535	51106	53677	56248	58819	61390	63961	66532	69103	71674	74245	76816
Sun City to Auld	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	8033	10104	12176	14247	16319	18390	20512	22533	24605	26676	28748	30819	32891	34962	37034	39106	41177	43249	45320	47392	49463	51535	53606	55678	57749	59821	61892
Valley EFG to Sun City	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4603	5789	6976	8163	9350	10537	11753	12911	14098	15285	16472	17659	18846	20033	21220	22406	23593	24780	25967	27154	28341	29528	30715	31902	33089	34276	35463
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	4530	5698	6866	8035	9203	10371	11568	12708	13876	15044	16212	17380	18549	19717	20885	22053	23222	24390	25558	26726	27895	29063	30231	31399	32567	33736	34904
Sun City to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2823	3551	4279	5007	5735	6463	7209	7919	8647	9375	10104	10832	11560	12288	13016	13744	14472	15200	15928	16656	17384	18112	18840	19568	20296	21024	21752
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	536	674	812	951	1089	1227	1369	1504	1642	1780	1918	2057	2195	2333	2471	2609	2748	2886	3024	3162	3301	3439	3577	3715	3854	3992	4130
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	473	596	718	840	962	1084	1209	1328	1450	1572	1694	1816	1938	2061	2183	2305	2427	2549	2671	2793	2915	3037	3159	3281	3404	3526	3648
Valley EFG to Auld #1	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	1830	2301	2773	3245	3717	4189	4672	5132	5604	6076	6548	7020	7491	7963	8435	8907	9379	9851	10322	10794	11266	11738	12210	12682	13153	13625	14097
Valley EFG to Auld #2	N-2	Valley-Sun City & Valley-Newcomb-Skylark	0.03096	1044	1313	1583	1852	2121	2391	2666	2929	3198	3468	3737	4006	4276	4545	4814	5083	5353	5622	5891	6161	6430	6699	6968	7238	7507	7776	8046
Valley EFG to Auld	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	204	256	309	361	414	466	520	571	624	676	729	781	834	886	939	992	1044	1097	1149	1202	1254	1307	1359	1412	1464	1517	1569
Skylark to Tap 22	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	49	61	74	86	99	111	124	137	149	162	174	187	199	212	224	237	250	262	275	287	300	312	325	337	350	363	375
Skylark to Tap 22	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	14	18	22	26	29	33	37	40	44	48	52	55	59	63	66	70	74	78	81	85	89	92	96	100	104	107	111
Valley EFG to Auld #2	N-2	Auld-Sun City & Valley-Newcomb-Skylark	0.0304	13	16	20	23	26	30	33	36	40	43	46	50	53	56	60	63	66	70	73	76	80	83	86	90	93	96	100
	Flex-2-1		0.01	2146216	2183888	2201776	2220157	2239489	2261652	2283812	2311205	2339071	2368206	2397723	2427633	2457986	2487626	2517525	2547619	2578055	2605932	2633734	2661374	2689036	2712646	2735683	2757974	2779664	2796081	2811049
	Flex-2-2		0.0015	16952	18977	20048	21063	22275	23415	24608	26296	27942	29789	31867	33856	36119	38347	40865	43370	46050	48161	50853	53284	55810	57808	60167	62203	64386	66380	67834

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)
Valley North Transformers	N-0	Basecase										
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074									
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366									
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366									
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092									
Pechanga (Voltage Violations)	N-1	Moraga-Pechanga	0.17578									
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244									
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553.397692	8865.952367	10178.50704	12352.39063	15978.61146	19604.83228	23231.05311	24464.10964	25697.16616
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2880.910564	3247.012629	3727.714694	4523.864637	5851.909761	7179.954885	8508.00001	9285.887631	10063.77525
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2943.982839	3321.04498	3812.70712	4627.009395	5985.334138	7343.65888	8701.983622	9486.207121	10270.43062
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405.404741	2688.87811	3086.95148	3746.249857	4846.015048	5945.780239	7045.54543	7775.666476	8505.787522
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2554.42714	2998.310201	3442.193262	4177.362714	5403.687247	6630.011779	7856.336311	8612.939344	9369.542377
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2318.891613	2721.845642	3124.79967	3792.181507	4905.430591	6018.679674	7131.928758	7864.871249	8597.81374
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	425.7378567	499.7183668	573.6988769	696.2271191	900.6145411	1105.001963	1309.389385	1852.156557	2394.92373
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	247.8543309	290.9240029	333.9936749	405.3266677	524.3161044	643.305541	762.2949777	839.1859158	916.076854
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814

Overloaded Element	Outage Category	Outage Definition	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)
Valley North Transformers	N-0	Basecase									
Auld to Moraga #2	N-1	Auld-Moraga #1				2	4	6	8	14	24
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark									1
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark				3	5	8	11	19	30
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty				3	6	9	13	22	33
Pechanga (Voltage Violations)	N-1	Moraga-Pechanga									2
Moraga-Pechanga	N-1	Valley EFG - Triton			4	13	23	33	42	52	65
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	26930.22269	28163.27922	22414	23565	24740	26390	28077	29800	32224
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	10841.66287	11619.55049	12110	12873	13637	14656	15677	16700	17548
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	11054.65412	11838.87762	12325	13094	13864	14896	15928	16963	17841
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	9235.908567	9966.029613	10282	10986	11692	12603	13517	14434	15053
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	10126.14541	10882.74844	11212	11945	12679	13643	14610	15580	16323
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	9330.756231	10063.69872	10579	11298	12018	12954	13890	14828	15464
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	2937.690902	3480.458074	3965	4496	5027	5597	6169	6740	6467
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	992.9677921	1069.85873	1143	1219	1296	1373	1449	1526	1603
	Flex-2-1		3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595
	Flex-2-2		26616	28305	30267	32347	34250	36508	38785	41361	43640

Overloaded Element	Outage Category	Outage Definition	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Valley North Transformers	N-0	Basecase		26	52	78	210	341	472	604	735
Auld to Moraga #2	N-1	Auld-Moraga #1	35	45	56	66	69	72	75	78	80.7
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	1	2	2	3	5	7	9	11	12.9
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	41	52	63	74	85	96	106	117	128.1
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	45	57	68	80	92	103	115	127	138.3
Pechanga (Voltage Violations)	N-1	Moraga-Pechanga	4	6	8	10	12	13	15	16	17.5
Moraga-Pechanga	N-1	Valley EFG - Triton	79	92	105	118	120	122	125	127	129
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	34692	37208	39775	42397	45074	47806	50593	53015	70096
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	18398	19249	20102	20956	21811	22668	23525	24384	25672
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	18721	19602	20485	21369	22255	23142	24030	24919	26257
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	15673	16296	16920	17545	18172	18800	19430	20060	21259
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	17067	17814	18563	19314	20066	20820	21576	22333	23705
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	16100	16737	17375	18014	18654	19294	19935	20577	21520
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	6191	5913	5634	5353	5071	4787	4503	4218	3951
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	1680	1756	1833	1910	1987	2064	2141	2217	2300
	Flex-2-1		3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		46028	48087	50731	52804	54806	56734	58797	60328	61697

Overloaded Element	Outage Category	Outage Definition	Probability	2022 (MWh)	2023 (MWh)	2024 (MWh)	2025 (MWh)	2026 (MWh)	2027 (MWh)	2028 (MWh)	2029 (MWh)	2030 (MWh)	2031 (MWh)	2032 (MWh)	2033 (MWh)	2034 (MWh)	2035 (MWh)	2036 (MWh)	2037 (MWh)	2038 (MWh)	2039 (MWh)	2040 (MWh)	2041 (MWh)	2042 (MWh)	2043 (MWh)	2044 (MWh)	2045 (MWh)	2046 (MWh)	2047 (MWh)	2048 (MWh)
Auld to Moraga #2	N-1	Auld-Moraga #1	0.36074													2	4	6	8	14	24	35	45	56	66	69	72	75	78	81
Valley EFG to Tap 39	N-1	Valley-Newcomb-Skylark	0.54366																		1	1	2	2	3	5	7	9	11	13
Tap 39 to Elsinore	N-1	Valley-Newcomb-Skylark	0.54366													3	5	8	11	19	30	41	52	63	74	85	96	106	117	128
Skylark to Tap 22 #1	N-1	Valley-Elsinore-Fogarty	0.59092													3	6	9	13	22	33	45	57	68	80	92	103	115	127	138
Pechanga (Voltage Violations)	N-1	Moraga-Pechanga	0.17578																		2	4	6	8	10	12	13	15	16	18
Moraga-Pechanga	N-1	Valley EFG - Triton	0.53244												4	13	23	33	42	52	65	79	92	105	118	120	122	125	127	129
Valley EFG to Auld#3	N-2	Valley-Auld #1 & Valley-Auld #2	0.06984	7553	8866	10179	12352	15979	19605	23231	24464	25697	26930	28163	22414	23565	24740	26390	28077	29800	32224	34692	37208	39775	42397	45074	47806	50593	53015	70096
Valley EFG to Auld#3	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2881	3247	3728	4524	5852	7180	8508	9286	10064	10842	11620	12110	12873	13637	14656	15677	16700	17548	18398	19249	20102	20956	21811	22668	23525	24384	25672
Valley EFG to Auld	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2944	3321	3813	4627	5985	7344	8702	9486	10270	11055	11839	12325	13094	13864	14896	15928	16963	17841	18721	19602	20485	21369	22255	23142	24030	24919	26257
Tap 39 to Elsinore	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	2405	2689	3087	3746	4846	5946	7046	7776	8506	9236	9966	10282	10986	11692	12603	13517	14434	15053	15673	16296	16920	17545	18172	18800	19430	20060	21259
Pachenga to Moraga	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	2554	2998	3442	4177	5404	6630	7856	8613	9370	10126	10883	11212	11945	12679	13643	14610	15580	16323	17067	17814	18563	19314	20066	20820	21576	22333	23705
Pachenga to Moraga	N-2	Valley-Auld #2 & Valley-Auld-Triton	0.016	2319	2722	3125	3792	4905	6019	7132	7865	8598	9331	10064	10579	11298	12018	12954	13890	14828	15464	16100	16737	17375	18014	18654	19294	19935	20577	21520
Valley EFG to Tap 39	N-2	Valley-Sun City(Valley to Auld#3) & Valley-Newcomb-Skylark	0.03096	426	500	574	696	901	1105	1309	1852	2395	2938	3480	3965	4496	5027	5597	6169	6740	6467	6191	5913	5634	5353	5071	4787	4503	4218	3951
Skylark to Tenaja	N-2	Auld-Moraga #2 & Valley-Auld-Triton	0.02696	248	291	334	405	524	643	762	839	916	993	1070	1143	1219	1296	1373	1449	1526	1603	1680	1756	1833	1910	1987	2064	2141	2217	2300
	Flex-2-1		0.01	3335455	3376522	3396022	3416059	3437133	3461293	3485449	3515311	3545688	3577448	3609625	3642230	3675318	3707629	3740222	3773027	3806206	3836595	3866902	3897033	3927188	3952925	3978038	4002337	4025981	4043878	4060195
	Flex-2-2		0.0015	14877	16456	17273	18226	19260	20543	21975	23348	24814	26616	28305	30267	32347	34250	36508	38785	41361	43640	46028	48087	50731	52804	54806	56734	58797	60328	61697

Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Michael Bass
Job Title: Senior Project Manager
Received Date: 3/24/2021

Response Date: 4/2/2021

Question DG-MISC-55 Revised :
Are the alternatives' annual costs specified in the spreadsheets provided, "nondiscounted"? Capital Expenditures: Construction cost streams (contained in "COSTS A.09-09-022 EDAlberhill-SCE-Supplemental Data Request 003 Question DG-G....xlsx") are provide below.

Are these annual "highlighted" figures, shown in Table 1 below, for all alternatives (i.e.shown for Alberhill) "non-discounted"? Also, are the annual revenue streams, not shown, related to BESS alternatives "non-discounted", as well?

Also, computational checks were performed on Capex (Capital Expenditure) and PVRR (Present Value Revenue Requirements) for all the alternatives. For our verification, provide the methodology (written, detailed) (with equations/spreadsheet) utilized in deriving the PVRR.

Response to Question DG-MISC-55 Revised :

Revision 1 of this data request is being submitted to reflect changes documented in Southern California Edison's Amended Motion to Supplement the Record dated February 1, 2021. This revision provides updated PVRR models to reflect changes to BESS market participation values due to the inclusion of Resources Adequacy payments, and alternative cost estimates.

Please see the attached file titled "A.09-09-022 CPUC-Supplemental Data Request-006 Question DG-MISC-55 Rev1.zip" which provides the requested information. Within this file, there are three folders, each containing the PVRR models of alternatives for the Effective PV load forecast, PV Watts forecast, and Spatial Base forecast. Within the PV Watts and Spatial Base forecast folders, only PVRR models of the DER-based alternatives are provided (i.e., Centralized BESS, SDGE and Centralized BESS, Mira Loma and Centralized BESS, Valley South to Valley North and Centralized BESS, Valley South to Valley North to Vista and Centralized BESS, and Valley South to Valley North and Distributed BESS), since the PVRR of non DER-based alternatives are identical for all three load forecasts.

Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Michael Bass
Job Title: Major Construction Senior Project Manager
Received Date: 9/16/2020

Response Date: 10/16/2020

Question DG-MISC-56:
Table 2 below displays O&M costs from 2022-2034 among the various alternatives under review. Are these O&M figures "non-discounted"? Also provide a detailed methodology for your inclusion of these O&M costs and Capital expenditures into the final PVRR figure
(cited above).

SEE TABLE 2 BELOW THE DATA REQUEST TABLE (Operation and Maintenance Costs)

Response to Question DG-MISC-56:

The O&M costs in the referenced table are not discounted and are factored into the PVRR analysis for discounting to present day dollars. The PVRR excel models for each alternative are included in response to Data Request DG-MISC-55, attached as folder titled "DG MISC 55 PVRR Models". The O&M figures are determined as a percentage of capital expenditure costs in current-year dollars and are escalated by 2.5% each year. For non-BESS alternatives, the O&M costs are 1.5% of capital costs. For BESS alternatives, inverter-related O&M costs are 1.7% of inverter capital costs, and battery-related O&M costs are 1.3% of battery capital costs. The O&M costs in the referenced table are not discounted and are factored into the PVRR analysis for discounting to present day dollars.

TABLE 1: DG-MISC-55

Alberhill System Project	TOTAL	PRIOR	2019.00	2020.00	2021.00	2022.00	2023.00	2024.00	2025.00	2026.00	2027.00	2028.00
Licensing	27.35	24.30	1.05	1.84	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Substation	215.47	0.00	0.00	0.00	10.37	74.24	108.55	22.30	0.00	0.00	0.00	0.00
Substation Estimate	*196.36*	*0.00*	*0.00*	*0.00*	*9.48*	*67.75*	*98.92*	*20.22*	*0.00*	*0.00*	*0.00*	*0.00*
Owners Agent (10% of construction)	*19.10*	*0.00*	*0.00*	*0.00*	*0.89*	*6.49*	*9.64*	*2.08*	*0.00*	*0.00*	*0.00*	*0.00*
Corporate Security	4.26	0.00	0.00	0.00	0.00	0.00	2.53	1.73	0.00	0.00	0.00	0.00
Bulk Transmission	52.59	0.00	0.00	0.00	2.54	18.14	26.49	5.42	0.00	0.00	0.00	0.00
Subtransmission	51.02	0.00	0.00	0.00	2.46	17.60	25.70	5.25	0.00	0.00	0.00	0.00
Transmission Telecom	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00
Distribution	3.67	0.00	0.00	0.00	0.00	1.26	1.84	0.57	0.00	0.00	0.00	0.00
IT Telecom	6.65	0.00	0.00	0.00	0.00	1.96	3.33	1.36	0.00	0.00	0.00	0.00
RP	34.40	15.64	0.00	0.00	1.84	15.00	1.92	0.00	0.00	0.00	0.00	0.00
Environmental	28.10	0.00	0.00	0.00	1.35	6.88	11.25	8.62	0.00	0.00	0.00	0.00
Subtotal Direct Cost	**423.66**	**39.94**	**1.05**	**1.84**	**18.72**	**135.09**	**181.62**	**45.40**	**0.00**	**0.00**	**0.00**	**0.00**
Subtotal Battery Cost	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Uncertainty	**121.28**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	121.28	0.00	0.00	0.00
Total with Uncertainty	**544.94**	**39.94**	**1.05**	**1.84**	**18.72**	**135.09**	**181.62**	**45.40**	**121.28**	**0.00**	**0.00**	**0.00**
Total Capex	**544.94**	**39.94**	**1.05**	**1.84**	**18.72**	**135.09**	**181.62**	**45.40**	**121.28**	**0.00**	**0.00**	**0.00**

PVRR	**545.00**

TABLE 2: DG-MISC-56 - Operation and Maintenance Costs

Total O&M	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Alberhill	$ 4.73	$ 4.84	$ 4.96	$ 5.09	$ 5.22	$ 5.35	$ 5.48	$ 5.62	$ 5.76	$ 5.90	$ 6.05	$ 6.20	$ 6.35
SDG&E	$ 3.78	$ 3.87	$ 3.97	$ 4.07	$ 4.17	$ 4.28	$ 4.38	$ 4.49	$ 4.61	$ 4.72	$ 4.84	$ 4.96	$ 5.08
SCE Orange County	$ 6.72	$ 6.89	$ 7.06	$ 7.24	$ 7.42	$ 7.60	$ 7.79	$ 7.99	$ 8.19	$ 8.39	$ 8.60	$ 8.82	$ 9.04
Menifee	$ 2.61	$ 2.68	$ 2.74	$ 2.81	$ 2.88	$ 2.95	$ 3.03	$ 3.10	$ 3.18	$ 3.26	$ 3.34	$ 3.42	$ 3.51
Mira Loma	$ 2.16	$ 2.21	$ 2.27	$ 2.33	$ 2.38	$ 2.44	$ 2.50	$ 2.57	$ 2.63	$ 2.70	$ 2.76	$ 2.83	$ 2.90
Valley South to Valley North	$ 1.32	$ 1.35	$ 1.39	$ 1.42	$ 1.46	$ 1.49	$ 1.53	$ 1.57	$ 1.61	$ 1.65	$ 1.69	$ 1.73	$ 1.78
Valley South to Valley North to Vista	$ 1.94	$ 1.98	$ 2.03	$ 2.08	$ 2.14	$ 2.19	$ 2.24	$ 2.30	$ 2.36	$ 2.42	$ 2.48	$ 2.54	$ 2.60
Centralized BESS	$ 2.41	$ 2.47	$ 2.53	$ 2.60	$ 2.66	$ 3.67	$ 3.76	$ 3.85	$ 3.95	$ 4.05	$ 5.27	$ 5.41	$ 5.54
Valley South to Valley North and Distributed BESS	$ 1.37	$ 1.40	$ 1.43	$ 1.47	$ 1.51	$ 1.54	$ 1.58	$ 1.62	$ 1.66	$ 1.70	$ 1.75	$ 1.79	$ 1.84
SDG&E and Centralized BESS	$ 4.44	$ 4.55	$ 4.66	$ 4.78	$ 4.90	$ 5.02	$ 5.15	$ 5.28	$ 5.41	$ 5.54	$ 5.68	$ 5.83	$ 5.97
Mira Loma and Centralized BESS	$ 3.36	$ 3.44	$ 3.53	$ 3.62	$ 3.71	$ 3.80	$ 3.90	$ 3.99	$ 4.09	$ 5.12	$ 5.25	$ 5.38	$ 5.52
Valley South to Valley North and Centralized BESS	$ 2.16	$ 2.21	$ 2.27	$ 2.33	$ 2.38	$ 2.44	$ 2.50	$ 2.57	$ 2.63	$ 2.70	$ 2.76	$ 2.83	$ 2.90
Valley South to Valley North to Vista and Centralized BESS	$ 2.10	$ 2.15	$ 2.21	$ 2.26	$ 2.32	$ 2.38	$ 2.44	$ 2.50	$ 2.56	$ 2.62	$ 2.69	$ 2.76	$ 2.82

Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Michael Bass
Job Title: Senior Project Manager
Received Date: 3/24/2021

Response Date: 4/2/2021

Question DG-MISC-56 Revised :
Table 2 below displays O&M costs from 2022-2034 among the various alternatives under review. Are these O&M figures "non-discounted"? Also provide a detailed methodology for your inclusion of these O&M costs and Capital expenditures into the final PVRR figure
(cited above).
SEE TABLE 2 BELOW THE DATA REQUEST TABLE (Operation and Maintenance Costs)

Response to Question DG-MISC-56 Revised :

Revision 1 of this data request is being submitted to reflect changes documented in Southern California Edison's Amended Motion to Supplement the Record dated February 1, 2021. The response provided in Revision 0 of this data response is still valid. The response previously referenced SCE's response to A.09-09-022 CPUC-Supplemental Data Request-006 Question DG-MISC-55. That response has been revised to include new PVRR models updated in SCE's compliance filing. Please see A.09-09-022 CPUC-Supplemental Data Request-006 Question DG-MISC-55 Revision 1.

Southern California Edison
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DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 10/1/2020

Question DG-MISC-57:
Explicitly cite and share the CEC load forecast data that was given to Quanta for their study.

Response to Question DG-MISC-57:

SCE provided Quanta a 10-year load forecast (1-in-2 year, non-coincident peak values covering the years of 2018-2027) for each of the distribution substations within the Valley North and South Systems. This distribution substation forecast was developed by SCE by taking the CEC's SCE system-wide forecast, disaggregating it to the individual distribution circuits, and then reaggregating it up to the distribution substations.

Please see the attached document titled "A.09-09-022 CPUC Supplemental Data Request-06 Q.DG-MISC-57.xlsx" which provides the data requested information.

System	Substation	Sub Type	Voltage	Projected									
				2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Valley North	Alessandro	SCE Distribution	115/12 kV	113.6	112.1	112.9	114.6	116.3	116.7	116.3	117.0	118.0	119.0
Valley North	Alessandro	SCE Distribution	115/33 kV	44.6	44.9	47.9	49.5	52.4	54.9	55.6	56.2	57.1	57.6
Valley North	Bunker	SCE Distribution	115/12 kV	82.3	82.3	81.8	81.6	80.6	79.6	78.7	78.0	76.8	76.1
Valley North	Cajalco	SCE Distribution	115/12 kV	61.4	63.8	63.3	62.5	62.9	63.0	64.6	64.6	64.7	64.6
Valley North	Karma	Customer	115/115 kV	27.8	23.1	25.3	25.5	26.0	27.0	30.0	33.0	36.0	36.0
Valley North	Lakeview	SCE Distribution	115/12 kV	19.7	19.5	19.4	20.0	20.9	21.4	22.0	22.5	22.9	23.5
Valley North	Mayberry	SCE Distribution	115/12 kV	98.0	97.1	96.9	98.3	97.7	97.0	94.2	93.6	93.1	92.6
Valley North	Moreno	SCE Distribution	115/12 kV	50.0	49.3	49.1	49.1	49.8	49.2	49.5	49.8	50.2	50.6
Valley North	Moval	Customer	115/115 kV	16.8	18.8	21.5	23.7	24.2	24.2	26.0	28.0	28.0	28.0
Valley North	MWD	Customer	115/115 kV	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6
Valley North	Nelson	SCE Distribution	115/12 kV	83.1	82.0	79.7	79.5	79.5	78.9	78.5	78.1	77.9	77.6
Valley North	Nelson	SCE Distribution	115/33 kV	52.0	52.4	56.0	56.3	56.7	56.8	56.7	56.7	56.8	56.7
Valley North	Stetson	SCE Distribution	115/12 kV	107.5	106.5	106.9	106.2	106.4	106.1	108.1	108.1	108.0	107.9
Valley North	Valley Jr	SCE Distribution	115/12 kV	70.3	75.0	79.6	79.9	80.5	80.6	80.8	80.8	81.0	81.1
Valley South	Auld	SCE Distribution	115/12 kV	113.0	113.2	114.3	115.9	118.2	119.6	120.5	121.4	122.8	124.0
Valley South	Auld	SCE Distribution	115/33 kV	28.2	29.4	30.0	31.2	32.2	32.8	33.4	33.9	34.8	35.7
Valley South	Elsinore	SCE Distribution	115/12 kV	63.5	63.0	63.2	63.9	64.8	65.3	65.9	66.4	66.9	67.3
Valley South	Elsinore	SCE Distribution	115/33 kV	33.2	33.2	33.1	33.6	33.6	33.5	33.5	33.5	33.5	33.4
Valley South	Fogarty	SCE Distribution	115/12 kV	29.6	29.5	29.4	29.3	30.2	30.9	32.2	33.3	33.6	33.5
Valley South	Ivyglen	SCE Distribution	115/12 kV	45.6	46.3	47.6	48.2	49.4	51.2	53.0	54.7	56.6	58.4
Valley South	Moraga	SCE Distribution	115/12 kV	116.2	122.0	121.8	121.8	121.5	120.9	122.1	121.2	120.7	120.3
Valley South	Newcomb	SCE Distribution	115/12 kV	130.5	128.6	130.5	132.9	135.5	136.9	138.3	139.6	141.2	142.5
Valley South	Pauba	SCE Distribution	115/12 kV	42.3	42.4	42.3	42.4	42.7	42.9	43.0	44.7	44.8	44.9
Valley South	Pechanga	SCE Distribution	115/12 kV	86.4	78.2	78.8	80.4	82.0	82.7	82.8	82.0	83.1	84.4
Valley South	Pechanga	SCE Distribution	115/33 kV	18.2	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
Valley South	Rectifier*	Customer	115/33 kV	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5
Valley South	Skylark	SCE Distribution	115/12 kV	65.0	64.5	64.8	65.9	67.4	68.0	68.7	69.4	70.3	71.1
Valley South	Stadler	SCE Distribution	115/12 kV	106.0	105.3	105.1	105.5	106.9	107.0	107.1	107.2	107.3	107.3
Valley South	Stent	Customer	115/12 kV	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
Valley South	Sun City	SCE Distribution	115/12 kV	49.2	54.7	60.0	63.0	66.3	68.8	69.4	70.1	70.8	71.4
Valley South	Tenaja	SCE Distribution	115/12 kV	51.3	51.0	51.0	50.9	50.3	50.3	50.3	50.3	50.4	50.5
Valley South	Triton	SCE Distribution	115/12 kV	54.1	53.8	53.9	54.0	54.0	54.0	52.3	52.3	52.5	52.7

* Rectifier is a customer dedicated transformer bank within Moraga substation and is modeled as load at Moraga 115 kV bus along with the distribution load

Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 10/6/2020

Question DG-MISC-58:
Provide full PSLF base cases representing ASP and the eleven alternatives. Provide the contingency files used by Quanta to conduct the reliability analyses.

Response to Question DG-MISC-58:

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Southern California Edison
A.09-09-022 – Alberhill PTC & CPCN

DATA REQUEST SET C P U C - S u p p l e m e n t a l D a t a R e q u e s t - 0 0 6

To: CPUC
Prepared by: Paul Mccabe
Job Title: Senior Advisor
Received Date: 9/16/2020

Response Date: 9/30/2020

Question DG-MISC-59:
Describe how the Period of Flexibility Deficit (PFD) results were derived. Were they based on the reliability indices (CAIDI, SAIDI, & SAIFI) or were they calculated from contingency results?

Response to Question DG-MISC-59:

The Period of Flexibility Deficit metric represents the number of hours each year in which there is a facility violation (line thermal overload or bus undervoltage). The results are derived from power flow simulations using the PSLF software.