

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-052	DIVIDE 70 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-053	DIVIDE 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-054	DIVIDE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-055	DIVIDE 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-056	DIVIDE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-057	FAIRWAY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-058	FAIRWAY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-059	GAREY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-060	GAREY 115 kV	Mesa-Sisquoc 115 kV Line and Santa Maria-Sisquoc 115 kV Line	C3	L-1-1	-8.7%	-9.0%	-10.5%	Monitor voltage deviation
LP-S-VD-061	GAREY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-062	LMPC-CTY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-063	LMPC-CTY 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-064	LMPC-CTY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-065	MANVILLE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-066	MANVILLE 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-067	MANVILLE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-068	MESA PGE 230 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-069	MESA_PGE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-070	MESA_PGE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-071	OCEANO 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-072	PALMR 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-073	PALMR 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-074	PURISIMA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-075	PURISIMA 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-076	PURISIMA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-077	RPSP1013 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-078	RPSP1013 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-079	RPSP1013 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-080	S.M.ASSO 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-081	S.M.ASSO 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-082	SISQUOC 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-083	SISQUOC 115 kV	Mesa-Sisquoc 115 kV Line and Santa Maria-Sisquoc 115 kV Line	C3	L-1-1	-8.7%	-9.0%	-10.5%	Monitor voltage deviation
LP-S-VD-084	SISQUOC 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-085	SNTA MRA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-086	SNTA MRA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-087	SNTA YNZ 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-088	SNTA YNZ 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-089	SNTA YNZ 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-090	SURF 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-091	SURF 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-092	SURF 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-093	TEMPLETN 230 kV	Templeton-Gates 230 kV Line and Morro Bay-Templeton 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-094	UNION OL 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-095	UNION OL 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-096	VAFB A-N 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-097	VAFB A-N 70 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-098	VAFB A-N 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-099	VAFB SSA 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-100	VAFB SSA 70 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-101	VAFB SSA 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-VD-102	VAFB SSB 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-103	VAFB SSB 70 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-104	VAFB SSB 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-105	ZACA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-106	ZACA 115 kV	Mesa-Divide 115 kV Line #1 & 2	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-VD-107	ZACA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-001	PSA RBL5 70 kV	Paso Robles-Templeton 70 kV Line	B	L-1	-5.78%	-2.63%		Adjust equipment voltage settings
LP-NPK-VD-002	PSA RBL5 70 kV	Templeton 230/70 kV Bank	B	T-1	-5.67%	-2.53%		Adjust equipment voltage settings
LP-NPK-VD-003	DIVIDE 70 kV	Morro Bay PP Unit 3 GSU Bank	B	T-1	-5.10%	0.15%		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-004	S.M.ASSO 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1044	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-005	SISQUOC 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1025	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-006	GAREY 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1026	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-007	SNTA MRA 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.0977	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-008	DIVVIDE 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1306	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-009	FAIRWAY 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1002	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-010	BUELLTON 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1272	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-011	SURF 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1306	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-012	PALMR 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.107	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-013	ZACA 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1216	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-014	SNTA YNZ 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1272	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-015	MANVILLE 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1116	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-016	CABRILLO 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1296	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-017	PURISIMA 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1176	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-018	DIVIDE 70 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1377	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-019	VAFB SSA 70 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1399	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-020	VAFB SSB 70 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1383	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

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					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-021	LMPC-CTY 115 kV	CB FAULT AT MESA SUB 115 CB102	C2	CB	-0.1143	Diverged		Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-NPK-VD-022	BUELLTON 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-3.40%	-19.11%		Monitor voltage deviation/drop load
LP-NPK-VD-023	CABRILLO 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-4.14%	-22.95%		Monitor voltage deviation/drop load
LP-NPK-VD-024	DIVIDE 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-5.19%	-28.14%		Monitor voltage deviation/action plan/drop load
LP-NPK-VD-025	DIVVIDE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-4.92%	-26.65%		Monitor voltage deviation/drop load
LP-NPK-VD-026	FAIRWAY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.53%	-15.25%		Monitor voltage deviation/drop load
LP-NPK-VD-027	GAREY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.48%	-15.17%		Monitor voltage deviation/drop load
LP-NPK-VD-028	LMPC-CTY 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-3.96%	-27.03%		Monitor voltage deviation/drop load
LP-NPK-VD-029	MANVILLE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-3.80%	-27.13%		Monitor voltage deviation/drop load
LP-NPK-VD-030	MESA PGE 230 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.15%	-15.98%		Monitor voltage deviation/drop load
LP-NPK-VD-031	OCEANO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-0.78%	-11.07%		Monitor voltage deviation/drop load
LP-NPK-VD-032	PALMR 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.48%	-15.30%		Monitor voltage deviation/drop load
LP-NPK-VD-033	PURISIMA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-4.16%	-26.96%		Monitor voltage deviation/drop load
LP-NPK-VD-034	S.M.ASSO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.44%	-15.52%		Monitor voltage deviation/drop load

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					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-035	SISQUOC 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.48%	-15.16%		Monitor voltage deviation/drop load
LP-NPK-VD-036	SNTA MRA 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.63%	-14.67%		Monitor voltage deviation/drop load
LP-NPK-VD-037	SNTA YNZ 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-3.40%	-19.11%		Monitor voltage deviation/drop load
LP-NPK-VD-038	SURF 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-4.27%	-23.66%		Monitor voltage deviation/drop load
LP-NPK-VD-039	UNION OL 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	-1.03%	-12.47%		Monitor voltage deviation/drop load
LP-NPK-VD-040	VAFB SSA 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-5.27%	-28.74%		Monitor voltage deviation/action plan/drop load
LP-NPK-VD-041	VAFB SSB 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-5.21%	-28.28%		Monitor voltage deviation/action plan/drop load
LP-NPK-VD-042	ZACA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	-2.71%	-16.41%		Monitor voltage deviation/drop load
LP-NPK-VD-043	BUELLTON 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-3.4%	-19.1%		Monitor voltage deviation/drop load
LP-NPK-VD-044	CABRILLO 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-4.1%	-23.0%		Monitor voltage deviation/drop load
LP-NPK-VD-045	DIVIDE 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-5.2%	-28.1%		Monitor voltage deviation/drop load
LP-NPK-VD-046	DIVVIDE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-4.9%	-26.6%		Monitor voltage deviation/drop load
LP-NPK-VD-047	FAIRWAY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.5%	-15.2%		Monitor voltage deviation/drop load
LP-NPK-VD-048	GAREY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.5%	-15.2%		Monitor voltage deviation/drop load
LP-NPK-VD-049	LMPC-CTY 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-4.0%	-27.0%		Monitor voltage deviation/drop load

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-050	MANVILLE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-3.8%	-27.1%		Monitor voltage deviation/drop load
LP-NPK-VD-051	MESA PGE 230 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.2%	-16.0%		Monitor voltage deviation/drop load
LP-NPK-VD-052	OCEANO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-0.8%	-11.1%		Monitor voltage deviation/drop load
LP-NPK-VD-053	PALMR 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.5%	-15.3%		Monitor voltage deviation/drop load
LP-NPK-VD-054	PURISIMA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-4.2%	-27.0%		Monitor voltage deviation/drop load
LP-NPK-VD-055	RPSP1013 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-3.1%	-27.1%		Monitor voltage deviation/drop load
LP-NPK-VD-056	S.M.ASSO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.4%	-15.5%		Monitor voltage deviation/drop load
LP-NPK-VD-057	SISQUOC 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.5%	-15.2%		Monitor voltage deviation/drop load
LP-NPK-VD-058	SNTA MRA 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.6%	-14.7%		Monitor voltage deviation/drop load
LP-NPK-VD-059	SNTA YNZ 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-3.4%	-19.1%		Monitor voltage deviation/drop load
LP-NPK-VD-060	SURF 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-4.3%	-23.7%		Monitor voltage deviation/drop load
LP-NPK-VD-061	TEMPLETN 230 kV	Templeton-Gates 230 kV Line and Morro Bay-Templeton 230 kV Line	C3	L-1-1	-4.8%	-17.6%		Existing Paso Robles SPS may operate
LP-NPK-VD-062	UNION OL 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C3	L-1-1	-1.0%	-12.5%		Monitor voltage deviation/drop load
LP-NPK-VD-063	VAFB SSA 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-5.3%	-28.7%		Monitor voltage deviation/drop load
LP-NPK-VD-064	VAFB SSB 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-5.2%	-28.3%		Monitor voltage deviation/drop load

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK-VD-065	ZACA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C3	L-1-1	-2.7%	-16.4%		Monitor voltage deviation/drop load

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-001	BUELLTON 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-002	DIVIDE 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-003	DIVVIDE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-004	FAIRWAY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-005	GAREY 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-006	LMPC-CTY 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-007	MANVILLE 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-008	MESA PGE 230 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-009	OCEANO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-010	PALMR 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-011	PURISIMA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-012	S.M.ASSO 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-013	SISQUOC 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-014	SNTA MRA 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-015	SNTA YNZ 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-016	SURF 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-017	UNION OL 115 kV	Morro Bay-Mesa and Diablo-Mesa 230 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-018	VAFB SSA 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-019	VAFB SSB 70 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-020	ZACA 115 kV	Mesa-Divide #1 and #2 115 kV Lines	C5-DCTL	L-2	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-021	BUELLTON 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-022	BUELLTON 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-023	BUELLTON 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-024	BUELLTON 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-025	CABRILLO 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-026	CABRILLO 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-027	CABRILLO 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-028	CABRILLO 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-029	DIVIDE 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-030	DIVIDE 70 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-031	DIVIDE 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-032	DIVVIDE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-033	DIVVIDE 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-034	DIVVIDE 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-035	DIVVIDE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-036	FAIRWAY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-037	FAIRWAY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-038	GAREY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-039	GAREY 115 kV	Mesa-Sisquoc 115 kV Line and Santa Maria-Sisquoc 115 kV Line	C3	L-1-1	0.918	0.914	0.893	Monitor voltage/drop load
LP-S-LV-040	GAREY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-041	LMPC-CTY 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-042	LMPC-CTY 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-043	LMPC-CTY 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-044	LMPC-CTY 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-045	MANVILLE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-046	MANVILLE 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-047	MANVILLE 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-048	MANVILLE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-049	MESA PGE 230 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-050	MESA_PGE 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-051	MESA_PGE 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-052	OCEANO 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-053	OCEANO 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-054	PALMR 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-055	PALMR 115 kV	Mesa-Sisquoc 115 kV Line and Santa Maria-Sisquoc 115 kV Line	C3	L-1-1	0.922	0.917	0.896	Monitor voltage/drop load
LP-S-LV-056	PALMR 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-057	PURISIMA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-058	PURISIMA 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-059	PURISIMA 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-060	PURISIMA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-061	RPSP1013 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-062	RPSP1013 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-063	RPSP1013 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-064	RPSP1013 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-065	S.M.ASSO 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-066	S.M.ASSO 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-067	SISQUOC 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-068	SISQUOC 115 kV	Mesa-Sisquoc 115 kV Line and Santa Maria-Sisquoc 115 kV Line	C3	L-1-1	0.919	0.914	0.893	Monitor voltage/drop load
LP-S-LV-069	SISQUOC 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-070	SNTA MRA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-071	SNTA MRA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-072	SNTA YNZ 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-073	SNTA YNZ 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-074	SNTA YNZ 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-075	SNTA YNZ 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-076	SURF 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-077	SURF 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-078	SURF 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-079	SURF 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-080	TEMPLETN 230 kV	Templeton-Gates 230 kV Line and Morro Bay-Templeton 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-081	UNION OL 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-082	UNION OL 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-083	VAFB A-N 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-084	VAFB A-N 70 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-085	VAFB A-N 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-086	VAFB SSA 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-087	VAFB SSA 70 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-088	VAFB SSA 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-089	VAFB SSB 70 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-090	VAFB SSB 70 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-091	VAFB SSB 70 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
LP-S-LV-092	ZACA 115 kV	Mesa 230/115 Bank #2 & 3	C3	T-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-093	ZACA 115 kV	Mesa-Divide 115 kV #1 & 2 Lines	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-094	ZACA 115 kV	Morro Bay-Diablo 230 kV Line and Morro Bay-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line
LP-S-LV-095	ZACA 115 kV	Morro Bay-Mesa 230 kV Line and Diablo-Mesa 230 kV Line	C3	L-1-1	Diverged	Diverged	Diverged	Drop load/provide another source by closing idle Midway-Santa Maria 115 kV Line. Convert to 230 kV line

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
LP-NPK_LV-001	ATASCDRO 70 kV	-	A	Normal	1.053	1.02		Under consideration for possible review
LP-NPK_LV-002	CAYUCOS 70 kV	-	A	Normal	1.054	1.03		Under consideration for possible review
LP-NPK_LV-003	PERRY 70 kV	-	A	Normal	1.053	1.03		Under consideration for possible review
LP-NPK_LV-004	CAMBRIA 70 kV	-	A	Normal	1.052	1.03		Under consideration for possible review
LP-NPK_LV-005	BAYWOOD 70 kV	-	A	Normal	1.056	1.03		Under consideration for possible review
LP-NPK_LV-006	MUSTANG 70 kV	-	A	Normal	1.058	1.02		Under consideration for possible review
LP-NPK_LV-007	SN LS OB 70 kV	-	A	Normal	1.064	1.03		Under consideration for possible review
LP-NPK_LV-008	DIVIDE 70 kV	-	A	Normal	1.090	1.03		Under consideration for possible review
LP-NPK_LV-009	VAFB SSA 70 kV	-	A	Normal	1.078	1.02		Under consideration for possible review
LP-NPK_LV-010	VAFB SSB 70 kV	-	A	Normal	1.089	1.03		Under consideration for possible review
LP-NPK_LV-011	VAFB SSB 70 kV	Divide 115/70 Bank #2	B	T-1	1.101	1.04		Under consideration for possible review
LP-NPK_LV-012	DIVIDE 70 kV	Divide 115/70 Bank #2	B	T-1	1.102	1.04		Under consideration for possible review

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Study Area: **PG&E Los Padres**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **PG&E Los Padres**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	Select..	

No single source substation with more than 100 MW Load

Appendix C-19
SCE Big Creek Corridor without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No thermal overloads were identified

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No voltage deviations were identified

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No high/low voltage were identified



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

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Study Area: **SCE Big Creek Corridor - without Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

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Study Area: **SCE Big Creek Corridor - without Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-20
SCE Big Creek Corridor with Renewables



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No thermal overloads were identified



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No thermal overloads were identified



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No voltage deviations were identified

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No voltage deviations were identified

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No high/low voltage were identified

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No high/low voltage were identified



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No transient stability issues identified.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient voltage deviations identified.

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Study Area: **SCE Big Creek Corridor - with Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Big Creek Corridor - with Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-21
SCE Antelope-Bailey without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-T-1	LANCASTER - TAP 69 66kV ck.1	Line ANTELOPE/LANCASTER/OASIS 66.0/TAP 68 66.0 Circuit 1,Line DEL SUR/LANCASTER/RITEAID/TAP 50 66.0 Circuit 1	C	L-1/L-1	106%	109%	110%	Operating procedure to manually shed load at Lancaster 66kV after the first contingency.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-DV-1	SHUTTLE 66kV	Line ANTELOPE/LANCSTR/LANPRI/SHUTTLE/TAP 70/69 66.0 Circuit 1,Line ANTELOPE/QUARTZHILL/SHUTTLE/TAP 93 66.0 Circuit 1	C	L-1/L-1	10.41%	14.13%	13.43%	Operating procedure to manually switch in shunt caps in Antelope-Bailey area after the first contingency.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-V-1	SHUTTLE 66kV	Line ANTELOPE/LANCSTR/LANPRI/SHUTTLE/TAP 70/69 66.0 Circuit 1,Line ANTELOPE/QUARTZHILL/SHUTTLE/TAP 93 66.0 Circuit 1	C	L-1/L-1	>.90	0.87	0.89	Operating procedure to manually switch in shunt caps in Antelope-Bailey area after the first contingency.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post- transient thermal overloads identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

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Study Area: **SCE Antelope-Bailey - without Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Antelope-Bailey - without Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-22
SCE Antelope-Bailey with Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-RPS-T-1	LANCASTER - TAP 69 66kV ck.1	Line ANTELOPE/LANCASTER/OASIS 66.0/TAP 68 66.0 Circuit 1,Line DEL SUR/LANCASTER/RITEAID/TAP 50 66.0 Circuit 1	C	L-1/L-1	105%	109%	111%	Operating procedure to manually shed load at Lancaster 66kV after the first contingency.



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No thermal overloads identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-RPS-DV-1	SHUTTLE 66kV	Line ANTELOPE/LANCSTR/LANPRI/SHUTTLE/TAP 70/69 66.0 Circuit 1,Line ANTELOPE/QUARTZHILL/SHUTTLE/TAP 93 66.0 Circuit 1	C	L-1/L-1	<10%	14.14%	14.07%	Operating procedure to manually switch in shunt caps in Antelope-Bailey area after the first contingency.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No voltage deviations were identified.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
AB-RPS-V-1	SHUTTLE 66kV	Line ANTELOPE/LANCSTR/LANPRI/SHUTTLE/TAP 70/69 66.0 Circuit 1,Line ANTELOPE/QUARTZHILL/SHUTTLE/TAP 93 66.0 Circuit 1	C	L-1/L-1	>.90	0.87	0.88	Operating procedure to manually switch in shunt caps in Antelope-Bailey area after the first contingency.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No high/low voltage were identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No transient stability issues identified.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient thermal overloads identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient voltage deviations identified.

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE Antelope-Bailey - with Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE Antelope-Bailey - with Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-23
SCE North of Lugo without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No thermal overloads identified.



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NOL-DV-1	TORTILLA 115kV	line COLWATER-SEG2-TORTILLA 115 ck 1	B	L-1	<5%	<5%	5.33%	Install shunt cap at Tortilla 115kV substation.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NOL-V-1	N/A	Tran CONTROL 115.00 to CONTROL 55.00 ck 1, Tran CONTROL 115.00 to CONTROL 55.00 ck 3	C	T-1/T-1	N/A	DIVERGE	DIVERGE	SPS to shed load at Control 55kV substation.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

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Study Area: **SCE North of Lugo - without Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE North of Lugo - without Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-24
SCE North of Lugo with Renewables



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No thermal overloads identified.



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No thermal overloads identified.



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No voltage deviations identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No voltage deviations identified.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
NOL-RPS-V-1	N/A	Tran CONTROL 115.00 to CONTROL 55.00 ck 1, Tran CONTROL 115.00 to CONTROL 55.00 ck 3	C	T-1/T-1	N/A	DIVERGE	DIVERGE	SPS to shed load at Control 55kV substation.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	
NOL-RPS-V-2	CONTROL 55kV	Line CSA DIAB 115.0 to CONTROL 115.0 ck 1,Line CSA DIAB-SHERWIN-CONTROL 115.0 ck 1	C	L-1/L-1	1.10	<1.10		Install or reconfigure existing shunt reactor(s) in Control area.
NOL-RPS-V-3	CONTROL 115kV	Line CSA DIAB 115.0 to CONTROL 115.0 ck 1,Line CSA DIAB-SHERWIN-CONTROL 115.0 ck 1	C	L-1/L-1	1.11	<1.10		Install or reconfigure existing shunt reactor(s) in Control area.
NOL-RPS-V-4	INYO 115kV	Line CSA DIAB 115.0 to CONTROL 115.0 ck 1,Line CSA DIAB-SHERWIN-CONTROL 115.0 ck 1	C	L-1/L-1	1.11	<1.10		Install or reconfigure existing shunt reactor(s) in Control area.
NOL-RPS-V-5	INYO PS 115kV	Line CSA DIAB 115.0 to CONTROL 115.0 ck 1,Line CSA DIAB-SHERWIN-CONTROL 115.0 ck 1	C	L-1/L-1	1.10	<1.10		Install or reconfigure existing shunt reactor(s) in Control area.

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No transient stability issues identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No transient stability issues identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient thermal overloads identified.



Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviation issues identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient voltage deviation issues identified.

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Study Area: **SCE North of Lugo - with Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE North of Lugo - with Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-25
SCE East of Lugo without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Off-Peak	2022 Summer Peak	
EOP-T-8	PAHRUMP_1 230 kV---PAHRUMP 138 kV Bank #2	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 bank #1 0.00	C	T-1/T-1	93%	103%	117%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
EOP-T-9	PAHRUMP_1 230 kV---PAHRUMP 138 kV Bank #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 bank #2 0.00	C	T-1/T-1	93%	105%	117%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-297	BOB TAP 230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-2.66%	-11.31%	-11.55%	Notice VEA. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-VD-298	ELDORDO2 230 kV Bus		C	L-1/L-1	0.00%	-11.14%	-11.47%	
VEA-VD-299	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-1.65%	-10.44%	-10.19%	

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Peak without Renewables**



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-267	CRAZY EYE TP230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	T-1/L-1	0.98	0.89	0.89	Non-load buses but eliminated by modifying Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
VEA-V-268	PAHRUMP_1 230 kV Bus		C	T-1/L-1	0.98	0.90	0.90	



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Peak without Renewables**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single source substation with more than 100 MW Load

Appendix C-26
SCE East of Lugo with Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Off-Peak	2022 Summer Peak	
EOP-T-1	PISGAH 230 kV---LUGO 230 kV	Line JASPER 230.0 to LUGO 230.0 Circuit 1	B	L-1	74%	64%	105%	Modify SPS previously identified in GIP to trip generation
EOP-T-2	ELDORDO 500 kV---LUGO 500 kV Ckt #1	Line LUGO 500.0 to VICTORVL 500.0 Ckt 1_Line PALOVRDE 500.0 to COLRIVER 500.0 Ckt 1	C	L-1/L-1	98%	91%	101%	Extend Operating Procedure No. 6610 (SOB T-135)
EOP-T-3	VEA Area - EOP 230 kV System	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	T-1/L-1	NA	<100%	Not Solved	Notice VEA. Modify VEA's Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP to trip generation, or curtail generation after first contingency
EOP-T-4	MEAD S 230 kV---BOB TAP 230 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	T-1/L-1	6%	98%	153%	modify Ivanpah-Eldorado SPS identified in GIP by ignoring the Category B outage of the SCE new Eldorado AA bank, and apply congestion management to curtail generation after 1st contingency
EOP-T-5	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/T-1	93%	104%	95%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
EOP-T-6	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	94%	105%	95%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	
EOP-T-7	MEAD S 230 kV---BOB TAP 230 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	T-1/L-1	6%	101%		modify Ivanpah-Eldorado SPS identified in GIP by ignoring the Category B outage of the SCE new Eldorado AA bank, and apply congestion management to curtail generation after 1st contingency

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
EOP-VD-1	BOB TAP 230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	-11.22%	Not Solved	Notice VEA. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
EOP-VD-2	ELDORDO2 230 kV Bus		C	L-1/L-1	NA	-11.07%	Not Solved	
EOP-VD-3	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-1.61%	-10.36%	Not Solved	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	
EOP-VD-4	BOB TAP 230 kV Bus	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	NA	-10.99%		Notice VEA. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply congestion management to curtail generation after first contingency
EOP-VD-5	ELDORDO2 230 kV Bus		C	L-1/L-1	NA	-10.85%		
EOP-VD-6	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-0.03%	-11.51%		

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Peak with Renewables**



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
EOP-V-1	CRAZY EYE TP230 kV Bus	Titan ELDORDO 500.0 to ELDORDOZ 230.0 Ckt 1_Line MEAD S 230.0 to BOB	C	T-1/L-1	0.98	0.89	Not Solved	Notice VEA. Modify Crazy Eye SPS identified in Cluster Alpha and Ivanpah-Eldorado SPS identified in GIP, or apply
EOP-V-2	PAHRUMP_1 230 kV Bus	TAP 230.0 Ckt 1	C	T-1/L-1	0.98	0.90	Not Solved	



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Light Load & Spring Off-Peak with Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Peak with Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single source substation with more than 100 MW Load

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **SCE East of Lugo - Summer Peak with Renewables**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No single source substation with more than 100 MW Load

Appendix C-27
SCE Eastern without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
E-SpWOR-TO-001	Mirage - Santa Rosa 115 kV	Mirage - Concho 115 kV	B	L-1	92.70%	95.40%	103.80%	Continue monitoring loading in future planning cycles and 1) reconductor existing line or 2) build a new line in a timely fashion.
E-SpWOR-TO-002	Garnet - Tap 817 115 kV	Devers - Farrell - Windland 115 kV & Devers - Garnet 115 kV	C	L-1/L-1	96.30%	101.80%	112.50%	30 minute rating (110%) allows manual adjustment after the second contingency per SCE SOB 004 until well after 2017. Continue monitoring loading in future planning cycles and modify planned Devers 115 kV RAS to include this contingency if necessary.
E-SpWOR-TO-003	Garnet - Tap 817 115 kV	Devers - Eisenhower - Thornhill 115 kV & Devers - Garnet 115 kV	C	L-1/L-1	94.50%	97.10%	109.90%	Same as above
E-SpWOR-TO-004	Mirage 230/115 kV No. 4 bank	Mirage No.1 & No.3 230/115 kV banks	C	T-1/T-1	115.60%	120.00%	128.50%	1) Include contingency in the planned Mirage 115 kV RAS 2) Manual adjustment after the initial contingency per SCE SOB 004.
E-SpWOR-TO-005	Mirage 230/115 kV No. 3 bank	Mirage No.1 & No.4 230/115 kV banks	C	T-1/T-1	115.60%	120.00%	128.50%	Same as above
E-SpWOR-TO-006	Mirage 230/115 kV No. 1 bank	Mirage No.3 & No.4 230/115 kV banks	C	T-1/T-1	115.60%	120.00%	128.50%	Same as above

Note: Mirage and Devers 115 kV facilities are expected to become non-ISO facilities once the system is split in 2013.

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No thermal overloads identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Off-Peak	2022 Summer Peak	

No voltage deviations identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No voltage deviations identified.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No high/low voltage issues identified.



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No high/low voltage issues identified.

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
E-SpWOR-TS-001	Julian Hinds - Mirage 230 kV	B	N-1	Stable but frequency dip at Julian Hinds MWD 6.9 kV buses exceeds limits	Stable but frequency dip at Julian Hinds MWD 6.9 kV buses exceeds limits	Stable but frequency dip at Julian Hinds MWD 6.9 kV buses exceeds limits	SCE/MWD established a less stringent frequency dip criteria (59.3 Hz for 6 cycles) at affected 6.9 kV buses in a letter submitted to WECC and accepted by the SRWG Compliance Committee Chair

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Summer Off-Peak	N/A	
E-SopWOR-TS-001	Julian Hinds - Mirage 230 kV	B	N-1	Stable but frequency dip at MWD's Julian Hinds 6.9 kV buses exceeds limits	Stable but frequency dip at MWD's Julian Hinds 6.9 kV buses exceeds limits		SCE/MWD established a less stringent frequency dip criteria (59.3 Hz for 6 cycles) at affected 6.9 kV buses in a letter submitted to WECC and accepted by the SRWG Compliance Committee Chair
E-SopWOR-TS-002	Iron Mountain - Camino - Mead- Gene 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Diverged		Operating solution
E-SopWOR-TS-003	Eagle Mountain - Iron Mountain 230 kV & Julian Hinds - Mirage 230 kV		L-1/L-1	Diverged	Diverged		Same as above

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overload issues identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					Select..	Select..	Select..	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
E-SpWOR-PT-001	Eagle Mountain	Palo Verde - Colorado River 500 kV (Full Blythe plant tripped)	B	L-1	7.70%	6.60%	9.70%	Operating solution
E-SpWOR-PT-002	Iron Mountain	Palo Verde - Colorado River 500 kV (Full Blythe plant tripped)	B	L-1	7.60%	5.70%	9.40%	Same as above
E-SpWOR-PT-003	Camino	Palo Verde - Colorado River 500 kV (Full Blythe plant tripped)	B	L-1	5.10%	< 5%	5.70%	Same as above
E-SpWOR-PT-004	Julian Hinds	Palo Verde - Colorado River 500 kV (Full Blythe plant tripped)	B	L-1	5.90%	< 5%	8.20%	Same as above

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	
E-SopWOR-PT-001	N/A	Iron Mountain - Camino - Mead- Gene 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Diverged		Operating solution
E-SopWOR-PT-002	N/A	Eagle Mountain - Iron Mountain 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Diverged		Same as above

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Study Area: **SCE Eastern area - without renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Eastern area - without renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-28
SCE Eastern with Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
E-SpWR-TO-001	Mirage - Santa Rosa 115 kV	Mirage - Concho 115 kV	B	L-1	92.90%	95.60%	104.40%	Continue monitoring loading in future planning cycles and 1) reconductor existing line or 2) build a new line in a timely fashion.
E-SpWR-TO-002	Garnet - Tap 817 115 kV	Devers - Farrell - Windland 115 kV & Devers - Garnet 115 kV	C	L-1/L-1	95.70%	102.20%	102.80%	30 minute rating (110%) allows manual adjustment after the second contingency per SCE SOB 004 until 2022. Continue monitoring loading in future planning cycles and modify planned Devers 115 kV RAS to include this contingency if necessary.
E-SpWR-TO-003	Garnet - Tap 817 115 kV	Devers - Eisenhower - Thornhill 115 kV & Devers - Garnet 115 kV	C	L-1/L-1	93.90%	97.40%	100.60%	Same as above
E-SpWR-TO-004	Mirage 230/115 kV No. 4 bank	Mirage No.1 & No.3 230/115 kV banks	C	T-1/T-1	115.60%	119.90%	128.30%	1) Include contingency in the planned Mirage 115 kV RAS 2) Manual adjustment after the initial contingency per SCE SOB 004.
E-SpWR-TO-005	Mirage 230/115 kV No. 3 bank	Mirage No.1 & No.4 230/115 kV banks	C	T-1/T-1	115.60%	119.90%	128.40%	Same as above
E-SpWR-TO-006	Mirage 230/115 kV No. 1 bank	Mirage No.3 & No.4 230/115 kV banks	C	T-1/T-1	115.60%	119.90%	128.40%	Same as above

Note: Mirage and Devers 115 kV facilities are expected to become non-ISO facilities once the system is split in 2013.



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No thermal overloads identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No voltage deviations identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No voltage deviations identified.



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					Select..	Select..	Select..	

No high/low voltage issues identified.



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
E-SPWR-TS-001	Julian Hinds - Mirage 230 kV	B	N-1	Stable but frequency dip at MWD's Julian Hinds and Eagle Mountain 6.9 kV buses exceeds limits	Stable but frequency dip at MWD's Julian Hinds and Eagle Mountain 6.9 kV buses exceeds limits	Stable but frequency dip at MWD's Julian Hinds 6.9 kV buses exceeds limits	SCE/MWD established a less stringent frequency dip criteria (59.3 Hz for 6 cycles) at affected 6.9 kV buses in a letter submitted to WECC and accepted by the SRWG Compliance Committee Chair

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Summer Off-Peak	N/A	
E-SopWR-TS-001	Julian Hinds - Mirage 230 kV	B	N-1	Stable but frequency dip at MWD's Julian Hinds 6.9 kV buses exceeds limits	Stable but frequency dip at MWD's Julian Hinds and Eagle Mountain 6.9 kV buses exceeds limits		SCE/MWD established a less stringent frequency dip criteria (59.3 Hz for 6 cycles) at affected 6.9 kV buses in a letter submitted to WECC and accepted by the SRWG Compliance Committee Chair
E-SopWR-TS-002	Iron Mountain - Camino - Mead- Gene 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Stable		Operating solution
E-SopWR-TS-003	Eagle Mountain - Iron Mountain 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Stable		Same as above

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.



Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient voltage deviations identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	N/A	
E-SopWR-PTVD-001	N/A	Iron Mountain - Camino - Mead- Gene 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Within limits		Operating solution
E-SopWR-PTVD-002	N/A	Eagle Mountain - Iron Mountain 230 kV & Julian Hinds - Mirage 230 kV	C	L-1/L-1	Diverged	Within limits		Same as above

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Study Area: **SCE Eastern area - with Renewables**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Eastern area - with Renewables**

Single Source Substation with more than 100 MW Load



ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-29
SCE Metro Area

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
MTR-T-1	Barre - Del Amo 230 kV Line	Alamitos - Center 230 kV Line, Alamitos - Lighthipe 230 kV Line	C	N-2	<100%	<100%	106%	SPS to reduce generation

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No thermal overloads identified.

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
MTR-DV-1	Viejo 230 kV	One SONGS Unit, SONGS - Viejo 230 kV Line	B	G-1/L-1	<5%	<5%	5.20%	Add shunt capacitor at Viejo

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No voltage deviations identified.

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No high/low voltage issues identified

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No high/low voltage issues identified.



Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

Transient Stability

ID	Contingency	Category	Category Description	Transient Stability Performance			Potential Mitigation Solutions
				2014 Summer Light Load	2017 Spring Off-Peak	N/A	

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No post-transient thermal overloads identified.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Spring Off-Peak	N/A	

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Metro**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **SCE Metro**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-30
SDG&E System

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-001	22644 PENSQTOS 69 - 22856 TOREYPNS 69 - ckt 1	TL0666 PQ-DM-DB-DH-TP ck 1	B	N-1	87%	94%	102%	Re-evaluate in future planning cycles. Investigate the potential for re-rating this line.
SD-T-002	22664 POMERADO 69 - 22828 SYCAMORE 69 - ckt 1	TL06924 POMERADO -SYCAMORE ck 2	B	N-1	98%	96%	103%	Dispatch local generation. Re-evaluate in future planning cycles
SD-T-003	22664 POMERADO 69 - 22828 SYCAMORE 69 - ckt 2	TL06915 POMERADO -SYCAMORE ck 1	B	N-1	98%	96%	103%	Dispatch local generation. Re-evaluate in future planning cycles
SD-T-004	22740 SANYSYRO 69 - 22608 OTAY TP 69 - ckt 1	TL0649 BD-OY-SYO ck 1	B	N-1	85%	92%	100%	Re-evaluate in future planning cycles. Reconfigure and reconductor overloaded elements in the metro area 69kV system.
SD-T-005	22740 SANYSYRO 69 - 22616 OTAYLKTP 69 - ckt 1	TL0623 OY-SYO-IB ck 1	B	N-1	85%	92%	100%	Re-evaluate in future planning cycles. Reconfigure and reconductor overloaded elements in the metro area 69kV system.
SD-T-006	22828 SYCAMORE 69 - 22756 SCRIPPS 69 - ckt 1	TL23042 OTAYMESA - BAY BLVD ck 1 (MIGUEL - BAY BLVD in 2022)	B	N-1	101%	106%	97%	Generation re-dispatch or reconductor.
SD-T-007	22831 SYCAMORE 138 - 22124 CHCARITA 138 - ckt 1	EA BK 60 230/138	B	N-1	< 80%	< 80%	106%	Generation re-dispatch or reconductor. Re-evaluate in future planning cycles
SD-T-008	22820 SWEETWTR 69 - 22824 SWTWTRTP 69 - ckt 1	Silvergate - Bay Blvd 230kV + Divbision QF	B	G-1/N-1	89%	101..4%	106%	Sweetwater reliability project
SD-T-009	22112 CAPSTRNO 138 - 22396 LAGNA NL 138 - ckt 1	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	255%	< 80%	< 80%	Pico loop-in (operational solution) or SPS to drop load
SD-T-010	22112 CAPSTRNO 138 - 22860 TRABUCO 138 - ckt 1	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	142%	< 80%	< 80%	Pico loop-in (operational solution) or SPS to drop load

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-011	22160 DEL MAR 69 - 22164 DELMARTP 69 - ckt 1	Del Mar 69kV E Bus	C	Bus	121%	131%	136%	Reconductor or SPS to drop local network load post-contingency or system reconfiguration
SD-T-012	22188 DOUBLTTP 69 - 22164 DELMARTP 69 - ckt 1	PQ-TP + PQ-GE	C	N-2	93%	100%	109%	Reconductor or SPS to drop load post-contingency
SD-T-013	22200 DUNHILTP 69 - 22188 DOUBLTTP 69 - ckt 1	PQ-TP + PQ-GE	C	N-2	93%	100%	109%	Reconductor or SPS to drop load post-contingency
SD-T-014	22208 EL CAJON 69 - 22408 LOSCOCHS 69 - ckt 1	Murray 69kV N Bus	C	Bus	116%	125%	90%	Reconductor or SPS to drop load post-contingency
SD-T-015	22272 ESCO 69 - 22876 WARCYNTP 69 - ckt 1	POM-SX #1+#2	C	N-2	107%	96%	105%	Reconductor or SPS to drop load post-contingency
SD-T-016	22306 GARFIELD 69 - 22208 EL CAJON 69 - ckt 1	Murray 69kV N Bus	C	Bus	122%	132%	143%	Reconductor or SPS to drop load post-contingency
SD-T-017	22420 SILVERGT 69 - 22868 URBAN 69 - ckt 1	SG-CR + SG-B	C	N-2	84%	100%	118%	Re-evaluate in future planning cycles.
SD-T-018	22440 MELROSE 69 - 22442 MELRSETP 69 - ckt 1	TL69YY SANLUSRY to OCEAN RANCH ck 1 and ck 2	C	N-2	N/A	116%	110%	Re-rate and dispatch generation or SPS to drop load post-contingency
SD-T-019	22456 MIGUEL 69 - 22364 JAMACHA 69 - ckt 2	Miguel 69kV S Bus	C	Bus	93%	90%	102%	Re-evaluate in future planning cycles.
SD-T-020	22512 MONSRATE 69 - 22016 AVCADOTP 69 - ckt 1	Lilac 69kV S Bus	C	Bus	95%	102%	< 80%	Re-rate and dispatch existing generation or SPS to drop load post-contingency
SD-T-021	22532 MURRAY 69 - 22306 GARFIELD 69 - ckt 1	Murray 69kV N Bus	C	Bus	101%	109%	118%	Reconductor or SPS to drop load post-contingency
SD-T-022	22604 OTAY 69 - 22616 OTAYLKTP 69 - ckt 1	ML-SW-SU-PD-BD-SS + ML-BD	C	N-2	< 80%	< 80%	101%	Also seen as a cat-B issue. Re-evaluate in future planning cycles.

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-023	22640 PENDLETN 69 - 22708 SANLUSRY 69 - ckt 1	Lilac 69kV S Bus	C	Bus	103%	108%	< 80%	Re-rate and dispatch existing generation or SPS to drop load post-contingency
SD-T-024	22644 PENSQTOS 69 - 22164 DELMARTP 69 - ckt 1	PQ-TP + PQ-GE	C	N-2	104%	112%	121%	Re-rate the line or SPS to drop local post-contingency
SD-T-025	22644 PENSQTOS 69 - 22856 TOREYPNS 69 - ckt 1	Penasquitos 69kV SW Bus	C	Bus	93%	101%	109%	Reconductor or re-rate or SPS to drop load post-contingency
SD-T-026	22664 POMERADO 69 - 22828 SYCAMORE 69 - ckt 2	Sycamore 69kV S Bus	C	Bus	145%	137%	148%	Install SPS to drop local area load post contingency or expand an existing SPS at Rancho Carmel
SD-T-027	22668 POWAY 69 - 22664 POMERADO 69 - ckt 1	PEN-ES #1 + #2 230 kV	C	N-2	119%	109%	107%	Not an N-2. Operational action plan (e.g. generation dispatch or switching solution or local network load drop after the first contingency)
SD-T-028	22668 POWAY 69 - 22676 R.CARMEL 69 - ckt 1	SX-PEN 230 kV + AR-SX 69 kV B	C	N-2	104%	86%	94%	Install SPS to drop load post-contingency
SD-T-029	22668 POWAY 69 - 22676 R.CARMEL 69 - ckt 1	SX-AR + SX-BE	C	N-2	-	125%	135%	Install SPS to drop load post-contingency
SD-T-030	22740 SANYSRO 69 - 22616 OTAYLKTP 69 - ckt 1	Otay 69kV E Bus	C	Bus	< 80%	< 80%	120%	Also seen as a cat-B issue. Reconductor or system reconfiguration. Re-evaluate in future planning cycles
SD-T-031	22768 BAY BLVD 69 - 22604 OTAY 69 - ckt 1	Bay Blvd 69kV SW Bus	C	Bus	99%	107%	< 80%	Install SPS to drop load post-contingency
SD-T-032	22828 SYCAMORE 69 - 22756 SCRIPPS 69 - ckt 1	MR-PQ + PQ-MRM	C	N-2	107%	112%	105%	Re-rate (short-term) and dispatch local generation or Install an SPS to drop load post-contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-033	22831 SYCAMORE 138 - 22124 CHCARITA 138 - ckt 1	ENCINA 230 kV 1E CB	C	CB	< 80%	< 80%	107%	Re-evaluate in future planning cycles.
SD-T-034	22831 SYCAMORE 138 - 22124 CHCARITA 138 - ckt 1	ENCINA 230 kV 2E CB	C	CB	< 80%	< 80%	107%	Re-evaluate in future planning cycles.
SD-T-035	22840 TALEGA 138 - 22656 PICO 138 - ckt 1	TA-PICO 1 + TA-RMV 1 138 kV	C	N-2	113%	< 80%	< 80%	Pico loop-in (operational solution) or SPS to drop load
SD-T-036	22840 TALEGA 138 - 22841 TA TAP 138 - ckt 1	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	178%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-037	22840 TALEGA 138 - 22842 TA TAP33 138 - ckt 1	TALEGA 138 kV 8T CB	C	CB	114%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-038	22841 TA TAP 138 - 22396 LAGNA NL 138 - ckt 1	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	332%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-039	22856 TOREYPNS 69 - 22200 DUNHILTP 69 - ckt 1	PQ-TP + PQ-GE	C	N-2	99%	107%	116%	Re-rate the line or install SPS to drop load post-contingency
SD-T-040	22884 WARNERS 69 - 22688 RINCON 69 - ckt 1	DE-ST-BC + CRE-ST	C	N-2	105%	116%	125%	Re-rate the line or install SPS to drop load post-contingency
SD-T-041	22842 TA TAP33 138 - 22656 PICO 138 - ckt 1	TALEGA 138 kV 8T CB	C	CB	111%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-042	22256 ESCNDIDO 69 - 22260 ESCNDIDO 230 - ckt 2	ESCNDIDO 230 kV 2N CB	C	CB	128%	128%	107%	Upgrade or SPS to drop load post-contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-043	22844 TALEGA 230 - 22840 TALEGA 138 - ckt 1	TALEGA 230 kV 4W CB	C	CB	120%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-044	22708 SANLUSRY 69 - 22582 OCEAN RANCH 69 - ckt 1	San Luis Rey 69kV SW Bus	C	Bus	N/A	136%	121%	Reconfiguration or SPS to droplload post-contingency
SD-T-045	22771 BAY BLVD 230 - 22464 MIGUEL 230 - ckt 1	ML-MS 230 kV #1	C	N-2	N/A	N/A	100%	Re-evaluate in future planning cycles.
SD-T-046	22771 BAY BLVD 230 - 22464 MIGUEL 230 - ckt 1	MISSION 230 kV 5T CB	C	CB	N/A	N/A	100%	Re-evaluate in future planning cycles.
SD-T-047	22008 ASH 69 - 22012 ASH TP 69 - ckt 1	TL0679 ESCNDIDO-FELICITA ck 1 _TL0689 ES-FE-BR ck 1	C	N-1-1	<80%	<80%	125%	Re-evaluate in future planning cycles. (drop local network load prior to the second contingency or implement a short-term rating and drop load after the second contingency or install SPS)
SD-T-048	22084 BORREGO 69 - 22540 NARROWS 69 - ckt 1	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	<80%	117%	Diverged	Drop local network load after prior to the second contingency or re-rate the line and drop local network load after the second contingency or install an SPS to drop load post-contingency
SD-T-049	22112 CAPSTRNO 138 - 22656 PICO 138 - ckt 1	TL13830 MARGARTA-TRABUCO ck 1 _TL13835 SANMATEO-LAGNA NL-TA TAP B	C	N-1-1	111%	N/A	N/A	Pico loop-in (operational solution) or SPS to drop load
SD-T-050	22112 CAPSTRNO 138 - 22860 TRABUCO 138 - ckt 1	TL13831 TALEGA-R.MSNVJO ck 1 _TL13833 CAPSTRNO-TRABUCO ck 1	C	N-1-1	146%	<80%	<80%	Pico loop-in (operational solution) or SPS to drop load

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-051	22152 CREELMAN 69 - 22828 SYCAMORE 69 - ckt 1	TL13821 SYCAMORE-SANTEE ck 1 _TL13824 TELECYN-ML60 TAP-LOSCOCHS ck 1	C	N-1-1	115%	122%	120%	Dispatch local generation and drop local network load prior to the second contingency or implement a short-term rating and drop load after the second contingency or install SPS
SD-T-052	22188 DOUBLTTP 69 - 22164 DELMARTP 69 - ckt 1	TL0662 PENSQTOS -TOREYPNS ck 1 _TL0665 MIRASNT0-GENESEE ck 1	C	N-1-1	<80%	<80%	113%	Re-evaluate in future planning cycles
SD-T-053	22200 DUNHILTP 69 - 22188 DOUBLTTP 69 - ckt 1	TL0662 PENSQTOS -TOREYPNS ck 1 _TL0665 MIRASNT0-GENESEE ck 1	C	N-1-1	<80%	<80%	113%	Re-evaluate in future planning cycles
SD-T-054	22252 ENCNITAS 69 - 22685 R.SNTTP1 69 - ckt 1	TL0617 PB-RN-LJ ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	<80%	91%	102%	Re-evaluate in future planning cycles
SD-T-055	22252 ENCNITAS 69 - 22160 DEL MAR 69 - ckt 1	TL0617 PB-RN-LJ ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	<80%	140%	156%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-056	22602 OMWD 69.00 - 22256 ESCNDIDO 69.00 - ckt 1	TL0660 ENCNITAS-DEL MAR ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	89%	190%	132%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-057	22602 OMWD 69.00 - 22603 Lkhodges 69.00 - ckt 1	TL0660 ENCNITAS-DEL MAR ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	<80%	184%	126%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-058	22603 Lkhodges 69.00 - 22060 BERNDOTP 69.00	TL0660 ENCNITAS-DEL MAR ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	<80%	184%	178%	Generation dispatch or switching solution or local network load drop prior to the second contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-059	22256 ESCNDIDO 69 - 22260 ESCNDIDO 230 - ckt 1	ES BK 71 69/230 _ES 72 BK 69/230	C	N-1-1	126%	127%	106%	Dispatch local generation
SD-T-060	22256 ESCNDIDO 69 - 22260 ESCNDIDO 230 - ckt 2	ES BK 70 69/230 _ES 72 BK 69/230	C	N-1-1	127%	86%	107%	Dispatch local generation
SD-T-061	22256 ESCNDIDO 69 - 22260 ESCNDIDO 230 - ckt 3	ES BK 70 69/230 _ES BK 71 69/230	C	N-1-1	129%	129%	108%	Dispatch local generation
SD-T-062	22256 ESCNDIDO 69 - 22272 ESCO 69 - ckt 1	TL06913 POWAY-POMERADO ck 1 _TL06918 ESCO-GOALLINE ck 1	C	N-1-1	<80%	95%	105%	Re-evaluate in future planning cycles.
SD-T-063	22256 ESCNDIDO 69 - 22724 SANMRCOS 69 - ckt 1	LD_ME OPEN 680A PEAK ME _LD_ME OPEN 693 PEAK ME/SM	C	N-1-1	<80%	136%	129%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-064	22272 ESCO 69 - 22876 WARCYNTP 69 - ckt 1	TL06915 POMERADO -SYCAMORE ck 1 _TL06924 POMERADO -SYCAMORE ck 2	C	N-1-1	<80%	<80%	105%	Re-evaluate in future planning cycles.
SD-T-065	22306 GARFIELD 69 - 22208 EL CAJON 69 - ckt 1	TL0618 MISSION-MURRAY ck 1 _TL0619 MISSION-MURRAY ck 2	C	N-1-1	122%	132%	143%	Reconfigure the system by switching actions
SD-T-066	22316 GENESEE 69 - 22644 PENSQTOS 69 - ckt 2	TL0665 MIRASNTO-GENESEE ck 1 _TL069 TOREYPNS to UCM ck 1	C	N-1-1	<80%	<80%	119%	Re-evaluate in future planning cycles
SD-T-067	22336 GRANITE 69 - 22340 GRANITTP 69 - ckt 1	TL0620 MURRAY-GARFIELD ck 1 _TL0631 EL CAJON-LOSCOCHS ck 1	C	N-1-1	97%	103%	86%	Dispatch local generation
SD-T-068	22356 IMPRLVLY 230 - 22360 IMPRLVLY 500 - ckt 2	IV BK 81 230/500 _IV BK 82 230/500	C	N-1-1	114%	104%	109%	Re-dispatch local generation
SD-T-069	22408 LOSCOCHS 69 - 22004 ALPINE 69 - ckt 1	TL06914 LOVELAND-LOSCOCHS ck 1 _TL06917 CREELMAN-SYCAMORE ck 1	C	N-1-1	<80%	90%	102%	Re-evaluate in future planning cycles.
SD-T-070	22408 LOSCOCHS 69 - 22216 ELLIOTT 69 - ckt 1	TL13821 SYCAMORE-SANTEE ck 1 _TL13824 TELECYN-ML60 TAP-LOSCOCHS ck 1	C	N-1-1	108%	119%	109%	Dispatch local generation

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-071	22420 SILVERGT 69 - 22868 URBAN 69 - ckt 1	OT BK 70 69/230 _OT BK 71 69/230	C	N-1-1	100%	108%	120%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-072	22440 MELROSE 69 - 22442 MELRSETP 69 - ckt 1	DIV QF 13.80 _LD_ME OPEN 693 PEAK ME/SM	C	N-1-1	<80%	117%	103%	Dispatch local generation
SD-T-073	22456 MIGUEL 69 - 22340 GRANITTP 69 - ckt 1	TL13821 SYCAMORE-SANTEE ck 1 _TL13824 TELECYN-ML60 TAP-LOSCOCHS ck 1	C	N-1-1	93%	98%	106%	Re-evaluate in future planning cycles.
SD-T-074	22464 MIGUEL 230 - 22461 MIGUEL60 138 - ckt 1	TL23042A BAY BLVD - MIGUEL ck 1 _TL13826 PRCTRVLVY-MIGUEL ck 1	C	N-1-1	88%	95%	121%	Re-evaluate in future planning cycles.
SD-T-075	22464 MIGUEL 230 - 22468 MIGUEL 500 - ckt 2	IV BK 82 230/500 _ML BK 80 230/500 ck 1	C	N-1-1	89%	90%	106%	Re-evaluate in future planning cycles.
SD-T-076	22464 MIGUEL 230 - 22472 MIGUELMP 500 - ckt 1	LC BK 50 138/69 _ML BK 81 230/500 ck 2	C	N-1-1	91%	90%	107%	Re-evaluate in future planning cycles.
SD-T-077	22464 MIGUEL 230 - 22504 MISSION 230 - ckt 1	TL23004 SANLUSRY - MISSION ck 2 _TL23042A BAY BLVD - MIGUEL ck 1	C	N-1-1	<80%	<80%	101%	Re-evaluate in future planning cycles.
SD-T-078	22464 MIGUEL 230 - 22504 MISSION 230 - ckt 2	TL23003 SANLUSRY - ENCINA ck 1 _TL23042A BAY BLVD - MIGUEL ck 1	C	N-1-1	<80%	<80%	101%	Re-evaluate in future planning cycles.
SD-T-079	22476 MIGUELTP 69 - 22456 MIGUEL 69 - ckt 1	TL23042A BAY BLVD - MIGUEL ck 1 _TL0621 PARADISE-MIGUEL ck 1	C	N-1-1	<80%	80%	104%	Re-evaluate in future planning cycles.
SD-T-080	22480 MIRAMAR 69 - 22296 FENTONTP 69 - ckt 1	TL06914 LOVELAND-LOSCOCHS ck 1 _LD_MRM OPEN 675 PEAK MRM/MR/SS	C	N-1-1	<80%	<80%	110%	Re-evaluate in future planning cycles.
SD-T-081	22480 MIRAMAR 69 - 22644 PENSQTOS 69 - ckt 1	TL0675 PENSQTOS-MESA RIM ck 1 _TL06916 SYCAMORE-SCRIPPS ck 1	C	N-1-1	113%	<80%	<80%	Dispatch local generation
SD-T-082	22500 MISSION 138 - 22496 MISSION 69 - ckt 1	MS BK 51 138/69 _MS BK 52 138/69	C	N-1-1	95%	106%	107%	Generation dispatch or switching solution or local network load drop prior to the second contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-083	22500 MISSION 138 - 22496 MISSION 69 - ckt 2	MS BK 50 138/69 _MS BK 52 138/69	C	N-1-1	123%	138%	140%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-084	22500 MISSION 138 - 22496 MISSION 69 - ckt 3	ML BK 81 230/500 ck 2 _MS BK 51 138/69	C	N-1-1	<80%	116%	83%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-085	22512 MONSRATE 69 - 22016 AVCADOTP 69 - ckt 1	LD_ME OPEN 680A PEAK ME _LD_ME OPEN 693 PEAK ME/SM	C	N-1-1	<80%	147%	87%	Dispatch local generation
SD-T-086	22512 MONSRATE 69 - 22524 MORHILTP 69 - ckt 1	TL06908 ESCNDIDO-ESCO ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	134%	<80%	<80%	Dispatch local generation
SD-T-087	22524 MORHILTP 69 - 22440 MELROSE 69 - ckt 1	TL06908 ESCNDIDO-ESCO ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	145%	<80%	<80%	Dispatch local generation
SD-T-088	22532 MURRAY 69 - 22306 GARFIELD 69 - ckt 1	TL0618 MISSION-MURRAY ck 1 _TL0619 MISSION-MURRAY ck 2	C	N-1-1	101%	109%	118%	Reconfigure the system
SD-T-089	22540 NARROWS 69 - 22884 WARNERS 69 - ckt 1	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	<80%	106%	Diverged	Drop local network load prior to the second contingency or re-rate the line and drop local network load after the second contingency or install an SPS to drop load post-contingency
SD-T-090	22604 OTAY 69 - 22608 OTAY TP 69 ckt 1	TL0647 BAY BLVD - IMPRLBCH ck 1 _TL0649 BD-OY-SYO ck 1	C	N-1-1	94%	102%	111%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-091	22604 OTAY 69 - 22616 OTAYLKTP 69 - ckt 1	TL0643 MIGUEL - JAMACHA ck 2 _TL06910 SALT CREEK - BORDER ck 1	C	N-1-1	<80%	<80%	102%	Re-evaluate in future planning cycles.

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-092	22636 PARADISE 69 - 22812 SUNYSDTP 69 - ckt 1	TL0621 PARADISE-MIGUEL ck 1 _TL06911 JAMACHA-SPRNGVLY ck 1	C	N-1-1	<80%	<80%	114%	Re-evaluate in future planning cycles.
SD-T-093	22640 PENDLETN 69 - 22016 AVCADOTP 69 - ckt 1	TL0680 SA-ME-SM ck 1 _LD_ME OPEN 680A PEAK ME	C	N-1-1	<80%	121%	<80%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-094	22644 PENSQTOS 69 - 22164 DELMARTP 69 - ckt 1	TL0662 PENSQTOS -TOREYPNS ck 1 _TL0665 MIRASNT0-GENESEE ck 1	C	N-1-1	<80%	<80%	124%	Re-evaluate in future planning cycles.
SD-T-095	22644 PENSQTOS 69 - 22648 PENSQTOS 138 - ckt 2	PQ BK 70 230/69 _PQ BK 71 230/69	C	N-1-1	92%	101%	91%	Dispatch local generation
SD-T-096	22644 PENSQTOS 69 - 22856 TOREYPNS 69 - ckt 1	TL23012 PENSQTOS - ENCINA ck 1 _TL0666 PQ-DM-DB-DH-TP ck 1	C	N-1-1	88%	94%	103%	Re-evaluate in future planning cycles.
SD-T-097	22648 PENSQTOS 138 - 22644 PENSQTOS 69 - ckt 1	PQ BK 70 230/69 _PQ BK 71 230/69	C	N-1-1	91%	100%	96%	Dispatch local generation
SD-T-098	22652 PENSQTOS 230 - 22644 PENSQTOS 69 - ckt 2	PQ60 PENSQTOS-PENSQTOS ck 1 _PQ BK 70 230/69	C	N-1-1	98%	100%	98%	Dispatch local generation
SD-T-099	22668 POWAY 69 - 22664 POMERADO 69 - ckt 1	TL23014 PEN-ESCNDIDO ck 1 _TL23015 PEN-ESCNDIDO ck 2	C	N-1-1	119%	109%	107%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-100	22668 POWAY 69 - 22676 R.CARMEL 69 - ckt 1	TL06939 BERNARDO-ARTESN ck 1 _TL06961 SYCAMORE-BERNARDO 69 ck 1	C	N-1-1	N/A	106%	114%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-101	22680 R.SNTAFE 69 - 22685 R.SNTTP1 69 - ckt 1	TL0660 ENCITAS-DEL MAR ck 1 _TL06952 NORTHCTY-PENSQTOS 69 ck 1	C	N-1-1	101%	<80%	<80%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-102	22716 SANLUSRY 230 - 22708 SANLUSRY 69 - ckt 1	SA BK 71 69/230 _SA BK 72 69/230	C	N-1-1	97%	100%	102%	Re-evaluate in future planning cycles.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **San Diego Area - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-103	22740 SANYS DRO 69 - 22608 OTAY TP 69 - ckt 1	TL0612 OLD TOWN-POINTLMA ck 2 _TL0649 BD-OY-SYO ck 1	C	N-1-1	85%	92%	101%	Re-evaluate in future planning cycles.
SD-T-104	22740 SANYS DRO 69 - 22616 OTAYLKTP 69 - ckt 1	TL0600 CM-KY-RN ck 1 SALT CREEK - BORDER ck 1 _TL06910	C	N-1-1	<80%	<80%	113%	Re-evaluate in future planning cycles.
SD-T-105	22768 BAY BLVD 69 - 22352 IMPRLBCH 69 - ckt 1	TL0645 BAY BLVD-OTAY ck 1 _TL0646 BAY BLVD - OTAY ck 2	C	N-1-1	127%	136%	<80%	Dispatch local generation
SD-T-106	22768 BAY BLVD 69 - 22604 OTAY 69 - ckt 1	TL0646 BAY BLVD - OTAY ck 2 _TL0647 BAY BLVD - IMPRLBCH ck 1	C	N-1-1	98%	106%	<80%	Dispatch local generation
SD-T-107	22768 BAY BLVD 69 - 22604 OTAY 69 - ckt 2	TL0645 BAY BLVD-OTAY ck 1 _TL0647 BAY BLVD - IMPRLBCH ck 1	C	N-1-1	99%	108%	<80%	Dispatch local generation
SD-T-108	22771 BAY BLVD 230 - 22464 MIGUEL 230 - ckt 1	TL23004 SANLUSRY - MISSION ck 2 _TL23022 MIGUEL - MISSION ck 1	C	N-1-1	N/A	N/A	100%	Re-evaluate in future planning cycles.
SD-T-109	22820 SWEETWTR 69 - 22824 SWTWTRTP 69 - ckt 1	TL23022 MIGUEL - MISSION ck 1 _TL23026 SILVERGT - BAY BLVD ck 1	C	N-1-1	91%	103%	118%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-110	22832 SYCAMORE 230 - 22828 SYCAMORE 69 - ckt 1	SX BK 71 230/69 _SX BK 72 230/69	C	N-1-1	110%	123%	132%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-111	22832 SYCAMORE 230 - 22828 SYCAMORE 69 - ckt 2	SX BK 70 230/69 _SX BK 71 230/69	C	N-1-1	115%	129%	138%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-112	22832 SYCAMORE 230 - 22828 SYCAMORE 69 - ckt 3	LC BK 51 69/138 _SX BK 70 230/69	C	N-1-1	85%	95%	102%	Re-evaluate in future planning cycles.

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-113	22840 TALEGA 138 - 22656 PICO 138 - ckt 1	TL13834 CAPSTRNO-TRABUCO ck 1 _TL13846 TALEGA-TA TAP33-PICO-SMO	C	N-1-1	113%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-114	22840 TALEGA 138 - 22842 TA TAP33 138 - ckt 1	TL13828 SYCAMORE-CARLTNHS ck 1 _TL13836 TALEGA-PICO ck 1	C	N-1-1	114%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-115	22842 TA TAP33 138 - 22656 PICO 138 - ckt 1	TL13828 SYCAMORE-CARLTNHS ck 1 _TL13836 TALEGA-PICO ck 1	C	N-1-1	111%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-116	22844 TALEGA 230 - 22840 TALEGA 138 - ckt 1	TA BK 62 230/138 _Ta BK 63 230/138	C	N-1-1	120%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-117	22844 TALEGA 230 - 22840 TALEGA 138 - ckt 3	TA BK 62 230/138 _Ta BK 63 230/138	C	N-1-1	118%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim
SD-T-118	22856 TOREYPNS 69 - 22200 DUNHILTP 69 - ckt 1	TL0662 PENSQTOS -TOREYPNS ck 1 _TL0665 MIRASNT0-GENESEE ck 1	C	N-1-1	<80%	<80%	120%	Re-evaluate in future planning cycles.
SD-T-119	22856 TOREYPNS 69 - 22200 DUNHILTP 69 - ckt 1	TL06905 GENESEE -PENSQTOS ck 2 _TL06959 MIRASNT0-PENSQTOS ck 1	C	N-1-1	<80%	102%	<80%	Generation dispatch or switching solution or local network load drop prior to the second contingency
SD-T-120	22856 TOREYPNS 69 - 22864 UCM 69 - ckt 1	TL06905 GENESEE -PENSQTOS ck 2 _TL06959 MIRASNT0-PENSQTOS ck 1	C	N-1-1	<80%	109%	<80%	Generation dispatch or switching solution or local network load drop prior to the second contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
SD-T-121	22884 WARNERS 69 - 22736 SANTYSBL 69 - ckt 1	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	213%	273%	Diverged	Drop local network load prior to the second contingency or re-rate the line and drop local network load after the second contingency or install an SPS to drop load post-contingency
SD-T-122	22884 WARNERS 69 - 22736 SANTYSBL 69 - ckt 1	TL0682 WARNERS-RINCON ck 1 _TL06926 RINCON -VALCNTR ck 1	C	N-1-1	<80%	<80%	153%	Generation dispatch or switching solution or local network load drop prior to the second contingency

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
SD-T-121	22841 TA TAP 138 - 22396 LAGNA NL 138 - ckt 1	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	107%	N/A	N/A	Previously approved M-SOCRUP will mitigate this issue. Install SPS or operational solution in the interim

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014	2017	2022	
SD-dV-01	AVCADOTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1	B	N-1	-5.41%	-5.70%	-3.61%	Upgrade the 69kV system from Pendleton to Rincon-Warners area and/or change tap settings at Escondido, Talega, San Luis Rey. Distribution caps in automatic mode can also mitigate the deviations.
SD-dV-02	AVOCADO 69 kV	TL06912 PENDLETN-SANLUSRY ck 1	B	N-1	-5.24%	-5.53%	-3.43%	Upgrade the 69kV system from Pendleton to Rincon-Warners area and/or change tap settings at Escondido, Talega, San Luis Rey. Distribution caps in automatic mode can also mitigate the deviations.
SD-dV-03	KETTNER 69 kV	TL0609 KETTNER-B ck 1	B	N-1	-3.12%	-4.98%	-5.12%	Re-evaluate in future planning cycles
SD-dV-04	MNSRATTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1	B	N-1	-5.03%	-5.31%	-3.22%	Upgrade the 69kV system from Pendleton to Rincon-Warners area and/or change tap settings at Escondido, Talega, San Luis Rey. Distribution caps in automatic mode can also mitigate the deviations.
SD-dV-05	MONSRATE 69 kV	TL06912 PENDLETN-SANLUSRY ck 1	B	N-1	-5.03%	-5.32%	-3.22%	Upgrade the 69kV system from Pendleton to Rincon-Warners area and/or change tap settings at Escondido, Talega, San Luis Rey. Distribution caps in automatic mode can also mitigate the deviations.
SD-dV-06	NORTHCTY 69 kV	TL06952 NORTHCTY-PENSQTOS 69 ck 1	B	N-1	-3.86%	-6.01%	-5.09%	Additional dynamic reactive support or adjust taps on Penasquitos banks. Adjust set points of reactive power sources.
SD-dV-07	PENDLETN 69 kV	TL06912 PENDLETN-SANLUSRY ck 1	B	N-1	-7.38%	-7.67%	-5.58%	Upgrade the 69kV system from Pendleton to Rincon-Warners area and/or change tap settings at Escondido, Talega, San Luis Rey. Distribution caps in automatic mode can also mitigate the deviations.
SD-dV-08	POWAY 69 kV	TL06913 POWAY-POMERADO ck 1	B	N-1	-4.89%	-4.79%	-6.01%	Re-evaluate in future planning cycles
SD-dV-09	WARCYNTP 69 kV	TL06913 POWAY-POMERADO ck 1	B	N-1	-4.18%	-4.05%	-5.06%	Re-evaluate in future planning cycles
SD-dV-10	WARENCYN 69 kV	TL06913 POWAY-POMERADO ck 1	B	N-1	-4.19%	-4.05%	-5.06%	Re-evaluate in future planning cycles

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014	2017	2022	
SD-dV-11	LILAC 69 kV	Lilac 69kV S Bus	C	Bus	-10.80%	-7.90%	-2.20%	Dynamic reactive support or SPS to drop load post-contingency
SD-dV-12	MARGARTA 138 kV	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	-10.10%	-0.50%	-0.60%	Dynamic reactive support or SPS to drop load post-contingency
SD-dV-13	PICO 138 kV	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	-10.20%	-0.10%	-0.10%	Dynamic reactive support or SPS to drop load post-contingency
SD-dV-14	POMERADO 69 kV	POM-SX #1+#2	C	N-2	-10.00%	-10.60%	-12.30%	Dynamic reactive support or SPS to drop load post-contingency
SD-dV-15	R.MSNVJO 138 kV	13831/36 N-2 TRIP 13812 SPS8.4C	C	N-2	-10.20%	-0.70%	-0.80%	Dynamic reactive support or SPS to drop load post-contingency
SD-dV-16	AVCADOTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-14.70%	-1.20%	-4.00%	Dispatch local generation after the first contingency
SD-dV-17	AVOCADO 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-14.60%	-1.20%	-3.80%	Dispatch local generation after the first contingency
SD-dV-18	BLDCRKTP 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-4.40%	-11.10%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-19	BOLDRCRK 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-4.40%	-11.10%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-20	MNSRATTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-14.30%	-1.30%	-3.60%	Dispatch local generation after the first contingency
SD-dV-21	MONSRATE 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-14.30%	-1.20%	-3.60%	Dispatch local generation after the first contingency
SD-dV-22	NARROWS 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-4.90%	-10.50%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-23	PALA 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-15.40%	-2.10%	-1.80%	Dispatch local generation after the first contingency
SD-dV-24	PA99MW 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-15.40%	-2.10%	-1.70%	Dispatch local generation after the first contingency
SD-dV-25	PENDLETN 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	-16.80%	-0.90%	-6.00%	Dispatch local generation after the first contingency

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014	2017	2022	
SD-dV-26	POMERADO 69 kV	TL06915 POMERADO -SYCAMORE ck 1 _TL06924 POMERADO -SYCAMORE ck 2	C	N-1-1	-0.80%	-0.70%	-12.30%	Operational action plan (Dispatch local generation after the first contingency) or rely on the existing SPS which drops load at Rancho Carmel.
SD-dV-27	RINCON 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-11.50%	-32.70%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-28	SANTYSBL 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-5.70%	-14.10%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-29	VALCNTR 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-11.50%	-33.20%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency
SD-dV-30	WARNERS 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	-5.10%	-16.70%	Diverged	Local network load reduction prior to the second contingency or SPS to drop load after the second contingency

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
SD-dV-31	BARRETT 69 kV	TL06957 LL-BAR ck 1	B	N-1	3.10%	1.50%	-5.20%	Re-evaluate in future planning cycles

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014	2017	2022	
SD-V-01	ALPINE 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.02	Voltage schedules to be adjusted appropriately and/or use of voltage control devices to maintain voltages within desired operating range.
SD-V-02	BARRETT 69 kV	Base system (n-0)	A	N-0	1.07	1.03	1.03	
SD-V-03	BLDCRKTP 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.02	
SD-V-04	BOLDRCRK 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.02	
SD-V-05	CAMERNTP 69 kV	Base system (n-0)	A	N-0	1.09	1.03	1.02	
SD-V-06	BOULEVRD 69 kV	Base system (n-0)	A	N-0	1.07	1.06	1.07	
SD-V-07	CAMERON 69 kV	Base system (n-0)	A	N-0	1.08	1.03	1.02	
SD-V-08	DESCANSO 69 kV	Base system (n-0)	A	N-0	1.07	1.03	1.02	
SD-V-09	GLENCLIF 69 kV	Base system (n-0)	A	N-0	1.08	1.03	1.02	
SD-V-10	GLNCLFTP 69 kV	Base system (n-0)	A	N-0	1.08	1.03	1.02	
SD-V-11	LOSCOCHS 69 kV	Base system (n-0)	A	N-0	1.05	1.04	1.03	
SD-V-12	LOVELAND 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.02	
SD-V-13	CRESTWD 69 kV	Base system (n-0)	A	N-0	1.11	1.03	1.03	
SD-V-14	KUMEYAA 69 kV	Base system (n-0)	A	N-0	1.11	1.03	1.03	
SD-V-15	LILAC 69 kV	Lilac 69kV S Bus	C	Bus	0.89	0.92	0.98	
SD-V-16	AVCADOTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.85	0.98	0.95	Dispatch local generation after the first contingency
SD-V-17	AVOCADO 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.84	0.97	0.94	Dispatch local generation after the first contingency
SD-V-18	MNSRATTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.85	0.98	0.95	Dispatch local generation after the first contingency
SD-V-19	MNSRATTP 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.85	0.98	0.95	Dispatch local generation after the first contingency
SD-V-20	MONSRATE 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.85	0.98	0.95	Dispatch local generation after the first contingency
SD-V-21	PALA 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.84	0.97	0.97	Dispatch local generation after the first contingency
SD-V-22	PA99MW 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.84	0.97	0.97	Dispatch local generation after the first contingency
SD-V-23	PENDLETN 69 kV	TL06912 PENDLETN-SANLUSRY ck 1 _TL06932 LILAC -PALA ck 1	C	N-1-1	0.83	0.99	0.94	Dispatch local generation after the first contingency

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014	2017	2022	
SD-V-24	RINCON 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	0.90	0.68	Diverged	Load reduction in the local area network prior to the second contingency or SPS to drop load after the second contingency
SD-V-25	SANTYSBL 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	0.99	0.88	Diverged	Load reduction in the local area network prior to the second contingency or SPS to drop load after the second contingency
SD-V-26	VALCNTR 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	0.89	0.67	Diverged	Load reduction in the local area network prior to the second contingency or SPS to drop load after the second contingency
SD-V-27	WARNERS 69 kV	TL0681 ASH-FE-VC ck 1 _TL0683 RINCON-LILAC ck 1	C	N-1-1	0.99	0.86	Diverged	Load reduction in the local area network prior to the second contingency or SPS to drop load after the second contingency

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
SD-V-28	ALPINE 69 kV	Base system (n-0)	A	N-0	1.11	1.05	1.08	Voltage schedules to be adjusted appropriately and/or use of voltage control devices to maintain voltages within desired operating range.
SD-V-29	BOLDRCRK 69 kV	Base system (n-0)	A	N-0	1.09	1.04	1.07	Same as above
SD-V-30	LRKSP_BD 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-31	BORDER 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-32	BORREGO 69 kV	Base system (n-0)	A	N-0	1.11	1.02	1.09	Same as above
SD-V-33	CAMERON 69 kV	Base system (n-0)	A	N-0	1.12	1.06	1.06	Same as above
SD-V-34	CHOLLAS 69 kV	Base system (n-0)	A	N-0	1.05	1.02	1.05	Same as above
SD-V-35	CLAIRMNT 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.07	Same as above
SD-V-36	EC GEN1 69 kV	Base system (n-0)	A	N-0	1.09	1.04	1.08	Same as above
SD-V-37	CREELMAN 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.07	Same as above
SD-V-38	DEL MAR 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-39	DESCANSO 69 kV	Base system (n-0)	A	N-0	1.11	1.05	1.08	Same as above
SD-V-40	DOUBLET 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-41	DUNHILL 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-42	EASTGATE 69 kV	Base system (n-0)	A	N-0	1.07	1.04	1.07	Same as above
SD-V-43	EL CAJON 69 kV	Base system (n-0)	A	N-0	1.09	1.04	1.08	Same as above
SD-V-44	ELLIOTT 69 kV	Base system (n-0)	A	N-0	1.06	1.05	1.07	Same as above
SD-V-45	ENCNITAS 69 kV	Base system (n-0)	A	N-0	1.07	1.04	1.07	Same as above
SD-V-46	F 69 kV	Base system (n-0)	A	N-0	1.06	1.05	1.08	Same as above
SD-V-47	FENTON 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.07	Same as above
SD-V-48	GARFIELD 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-49	GENESEE 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.07	Same as above
SD-V-50	GLENCLIF 69 kV	Base system (n-0)	A	N-0	1.12	1.06	1.06	Same as above
SD-V-51	GRANITE 69 kV	Base system (n-0)	A	N-0	1.09	1.04	1.09	Same as above
SD-V-52	IMPRLBCH 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.05	Same as above
SD-V-53	IMPRLVLY 500 kV	Base system (n-0)	A	N-0	1.04	1.05	1.04	Same as above
SD-V-54	JAMACHA 69 kV	Base system (n-0)	A	N-0	1.07	1.03	1.07	Same as above
SD-V-55	KEARNY 69 kV	Base system (n-0)	A	N-0	1.06	1.05	1.07	Same as above

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
SD-V-56	KYOCERA 69 kV	Base system (n-0)	A	N-0	1.06	1.05	1.07	Same as above
SD-V-57	LA JOLLA 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-58	LOSCOCHS 69 kV	Base system (n-0)	A	N-0	1.11	1.06	1.09	Same as above
SD-V-59	LOVELAND 69 kV	Base system (n-0)	A	N-0	1.11	1.05	1.08	Same as above
SD-V-60	MESA RIM 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.07	Same as above
SD-V-61	MESAHGTS 69 kV	Base system (n-0)	A	N-0	1.06	1.05	1.07	Same as above
SD-V-62	MIGUEL 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.05	Same as above
SD-V-63	MIRAMAR 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.07	Same as above
SD-V-64	MIRAMAR1 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.07	Same as above
SD-V-65	MISSION 69 kV	Base system (n-0)	A	N-0	1.07	1.05	1.08	Same as above
SD-V-66	MONTGMRY 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.05	Same as above
SD-V-67	MURRAY 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-68	N.GILA 500 kV	Base system (n-0)	A	N-0	1.05	1.07	1.06	Same as above
SD-V-69	NARROWS 69 kV	Base system (n-0)	A	N-0	1.10	1.03	1.09	Same as above
SD-V-70	NORTHCTY 69 kV	Base system (n-0)	A	N-0	1.07	1.04	1.07	Same as above
SD-V-71	Lkhodges 69 kV	Base system (n-0)	A	N-0	1.05	1.02	1.05	Same as above
SD-V-72	OTAY 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.05	Same as above
SD-V-73	OTAYLAKE 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-74	OY GEN 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.05	Same as above
SD-V-75	PARADISE 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.05	Same as above
SD-V-76	PENSQTOS 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-77	R.SNTAFE 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-78	RINCON 69 kV	Base system (n-0)	A	N-0	1.05	1.01	1.05	Same as above
SD-V-79	ROSE CYN 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.07	Same as above
SD-V-80	SANTYSBL 69 kV	Base system (n-0)	A	N-0	1.08	1.03	1.07	Same as above
SD-V-81	SANYSDRO 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.05	Same as above
SD-V-82	SCRIPPS 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.06	Same as above
SD-V-83	BAY BLVD 69 kV	Base system (n-0)	A	N-0	1.06	1.04	1.05	Same as above
SD-V-84	SPRNGVLY 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-85	SUNYSIDE 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.05	Same as above
SD-V-86	SWEETWTR 69 kV	Base system (n-0)	A	N-0	1.05	1.03	1.05	Same as above

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
SD-V-87	TOREYPNS 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-88	UCM 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.07	Same as above
SD-V-89	WARNERS 69 kV	Base system (n-0)	A	N-0	1.08	1.03	1.07	Same as above
SD-V-90	CRESTWD 69 kV	Base system (n-0)	A	N-0	1.13	1.08	1.05	Same as above
SD-V-91	KUMEYAAY 69 kV	Base system (n-0)	A	N-0	1.13	1.08	1.05	Same as above
SD-V-92	CALPK_BD 69 kV	Base system (n-0)	A	N-0	1.06	1.03	1.06	Same as above
SD-V-93	EC GEN2 69 kV	Base system (n-0)	A	N-0	1.09	1.04	1.08	Same as above
SD-V-94	MIRASNT0 69 kV	Base system (n-0)	A	N-0	1.08	1.04	1.08	Same as above
SD-V-95	SALT CREEK 69 kV	Base system (n-0)	A	N-0	N/A	1.03	1.05	Same as above

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014	2017	2022	
PSTR-local-SD-T-01	MIGUEL 230.0 - BAY BLVD 230.0 #1	Miguel - Mission 230kV line #1 and #2	C	N-2	<100%	<100%	100.20%	Generation curtailment or Re-rate the line or Reconductor. Re-evaluate in future planning cycles.
PSTR-local-SD-T-02	ESCNDIDO 230.0 - TA230 TA 230.0 #1	SONGS - Capistrano and SONGS - Talega 230kV lines	C	N-2	N/A	<100%	107.00%	Re-rate the line or SPS to shed local network load post-contingency. Re-evaluate in future planning cycles.
PSTR-bulk-SD-T-01	MIGUEL 230 - BAY BLVD 230 #1	Base case	A	N-0	<100%	<100%	104%	Generation curtailment or Re-rate the line or Reconductor. Re-evaluate in future planning cycles.
PSTR-bulk-SD-T-02	MIGUEL 230.0 BAY BLVD 230.0 #1	Miguel - Mission 230kV line #1 and #2	C	N-2	<100%	<100%	109.00%	Generation curtailment or Re-rate the line or Reconductor. Re-evaluate in future planning cycles.
PSTR-bulk-SD-T-03	ESCNDIDO 230.0 TA230 TA 230.0 #1	SONGS - Capistrano and SONGS - Talega 230kV lines	C	N-2	N/A	<100%	104%	Re-rate the line or SPS to shed local network load post-contingency. Re-evaluate in future planning cycles.

Post-Transient Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					Select..	Select..	Select..	

No post-transient thermal overloads identified.

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Light Load	2017 Summer Off-Peak	2022 Summer Light Load	
PSTR-local-SD-dV-01	Miguel 500kV	Miguel - ECO 500KV line	B	N-1	5.80%	6.40%	<5%	Operate local SVDs in automatic mode and/or add dynamic reactive support
PSTR-bulk-SD-dV-01	Miguel 500kV	Miguel - ECO 500KV line	B	N-1	5.80%	<5%	<5%	Operate local SVDs in automatic mode and/or add dynamic reactive support
PSTR-bulk-SD-dV-02	Eastern and central 69kV system	Miguel-ECO 500kV with CFE cross-trip	B	N-1	N/A	N/A	6% to 9%	Operate SVDs and distribution capacitors in automatic mode under peak load conditions to mitigate the deviations and/or add dynamic reactive support
PSTR-bulk-SD-dV-03 (ADD)	-	Sunrise Power Link + Miguel - ECO	C	N-1-1	<10%	<10%	Diverged	Dynamic reactive support in SDG&E and/or additional internal generation in San Diego area

Post-Transient Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					Select..	Select..	Select..	

No post-transient voltage deviations identified.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **San Diego Area**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2014	2017	2022	

No single contingency resulted in total load drop of more than 250 MW.

2012/2013 ISO Reliability Assessment - Final Study Results

Study Area: **San Diego Area**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014	2017	2022	

No single source substation with more than 100 MW Load

Appendix C-31
VEA without Renewables

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-74	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Circuit 1	B	L-1	100%	52%	49%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project. Prior to the project, request NVE to operate the Nwest 138 kV bus voltage at about 1.03 pu
VEA-T-75	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		B	L-1	101%	53%	50%	
VEA-T-76	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		B	L-1	102%	69%	65%	
VEA-T-77	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Circuit 1 0.00	B	L-1	93%	98%	107%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-T-78	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Circuit 2 0.00	B	L-1	93%	99%	107%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-T-79	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Brkr Fail VISTA-PAHRUMP 138 & VISTA-CHARLESTON 138 1.000 CatC BKR Flt	C	Breaker Failure	NA	109%	96%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-T-80	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	NA	109%	97%	
VEA-T-81	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	Breaker Failure	NA	105%	91%	
VEA-T-82	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	Breaker Failure	NA	104%	90%	
VEA-T-83	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	NA	110%	98%	

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-84	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Flt	C	Breaker Failure	100%	90%	89%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-T-85	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	101%	91%	89%	
VEA-T-86	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	Breaker Failure	102%	92%	91%	
VEA-T-87	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Ckt 1_Line GAMEBIRD 138.0 to THSNDAIR 138.0 Ckt 1	C	L-1/L-1	100%	Not Solved	Not Solved	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-88	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	101%	Not Solved	Not Solved	
VEA-T-89	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	102%	Not Solved	Not Solved	
VEA-T-90	CANYON 138 kV---SNOW MTN 138 kV Ckt #1	Line PAHRUMP 138.0 to VISTA 138.0 Ckt 1_Line THSNDAIR 138.0 to CHARLSTN 138.0 Ckt 1	C	L-1/L-1	101%	132%	118%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-91	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	96%	126%	111%	
VEA-T-92	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	102%	133%	119%	
VEA-T-93	CANYON 138 kV---COLDCREK 138 kV Ckt #1	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	123%	128%	134%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-94	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	118%	123%	126%	
VEA-T-95	IS TAP 138 kV---MERCERYSW 138 kV Ckt #1		C	L-1/L-1	111%	115%	116%	
VEA-T-96	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	118%	123%	126%	
VEA-T-97	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	124%	130%	136%	

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-98	COLDCREK 138 kV---RADAR 138 kV Ckt #1	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	117%	122%	125%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate impact on the vicinity area (Zone 183/187)
VEA-T-99	IS TAP 138 kV---MERCERYSW 138 kV Ckt #1		C	L-1/L-1	110%	114%	115%	
VEA-T-100	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	117%	122%	125%	
VEA-T-101	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	123%	129%	134%	
VEA-T-102	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	141%	153%	159%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-103	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	L-1/L-1	129%	135%	142%	
VEA-T-104	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	129%	135%	142%	
VEA-T-105	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	123%	129%	134%	
VEA-T-106	IS TAP 138 kV---MERCERYSW 138 kV Ckt #1		C	L-1/L-1	116%	121%	123%	
VEA-T-107	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	123%	129%	133%	
VEA-T-108	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	130%	136%	143%	

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-109	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	140%	151%	157%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-T-110	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	L-1/L-1	127%	133%	140%	
VEA-T-111	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	128%	133%	140%	
VEA-T-112	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	122%	127%	132%	
VEA-T-113	IS TAP 138 kV---MERCERYSW 138 kV Ckt #1		C	L-1/L-1	115%	120%	122%	
VEA-T-114	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	L-1/L-1	122%	127%	132%	
VEA-T-115	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	L-1/L-1	129%	134%	142%	
VEA-T-116	AMARGOSA 230 kV---AMARGOSA 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	141%	153%	159%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-117	CANYON 138 kV---COLDCREK 138 kV Ckt #1		C	T-1/T-1	129%	135%	142%	
VEA-T-118	CANYON 138 kV---SNOW MTN 138 kV Ckt #1		C	T-1/T-1	129%	135%	142%	
VEA-T-119	COLDCREK 138 kV---RADAR 138 kV Ckt #1		C	T-1/T-1	123%	129%	133%	
VEA-T-120	IS TAP 138 kV---MERCERYSW 138 kV Ckt #1		C	T-1/T-1	116%	122%	123%	
VEA-T-121	IS TAP 138 kV---RADAR 138 kV Ckt #1		C	T-1/T-1	123%	129%	133%	
VEA-T-122	NWEST 138 kV---SNOW MTN 138 kV Ckt #1		C	T-1/T-1	130%	136%	143%	

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Study Area: **Valley Electric Association - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-123	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line AMARGOSA 138.0 to SANDY 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	107%	115%	118%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-124	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line AMARGOSA 138.0 to SANDY 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	107%	115%	118%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-125	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line GAMEBIRD 138.0 to GAMEBIRD_PST 138.0 Ckt bp_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	103%	111%	114%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-126	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line GAMEBIRD 138.0 to GAMEBIRD_PST 138.0 Ckt bp_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	103%	111%	114%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-127	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Line SANDY 138.0 to GAMEBIRD_PST 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/L-1	103%	111%	114%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-128	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Line SANDY 138.0 to GAMEBIRD_PST 138.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/L-1	103%	111%	114%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-129	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran AMARGOSA 230.00 to AMARGOSA 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/T-1	106%	114%	118%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project

2012/2013 ISO Reliability Assessment - Study Results

Study Area: **Valley Electric Association - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-130	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran AMARGOSA 230.00 to AMARGOSA 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	107%	114%	118%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-131	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line IS TAP 138.0 to MERCRYSW 138.0 Ckt 1	C	T-1/L-1	108%	112%	117%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-132	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line CANYON 138.0 to COLDCREK 138.0 Ckt 1	C	T-1/L-1	115%	119%	127%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-133	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line CANYON 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	119%	127%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-134	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line COLDCREK 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	122%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-135	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line IS TAP 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	122%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-136	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Line NWEST 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	120%	128%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-137	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line IS TAP 138.0 to MERCYSW 138.0 Ckt 1	C	T-1/L-1	108%	113%	117%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-138	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line CANYON 138.0 to COLDCREK 138.0 Ckt 1	C	T-1/L-1	115%	120%	127%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-139	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line CANYON 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	120%	127%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-140	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line COLDCREK 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	122%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-141	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line IS TAP 138.0 to RADAR 138.0 Ckt 1	C	T-1/L-1	111%	116%	122%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-142	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00_Line NWEST 138.0 to SNOW MTN 138.0 Ckt 1	C	T-1/L-1	115%	121%	128%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-T-143	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #2	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00	C	T-1/T-1	93%	103%	117%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-T-144	PAHRUMP_1 230 kV---PAHRUMP 138 kV Ckt #1	Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	93%	105%	117%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-156	BEATTY 138 kV Bus	Line PAHRUMP 138.0 to VISTA 138.0 Circuit 1	B	L-1	-6.47%	-0.92%	-0.85%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project. Prior to the project, request NVE to operate the Nwest 138 kV bus voltage at about 1.03 pu
VEA-VD-157	BONDGDTP 138 kV Bus		B	L-1	-6.47%	-0.92%	-0.85%	
VEA-VD-158	FRENCHMN 138 kV Bus		B	L-1	-5.58%	-0.79%	-0.73%	
VEA-VD-159	GROOM LK 138 kV Bus		B	L-1	-5.97%	-0.86%	-0.79%	
VEA-VD-160	JACKASSF 138 kV Bus		B	L-1	-6.28%	-0.90%	-0.84%	
VEA-VD-161	JOHNNIE 138 kV Bus		B	L-1	-7.20%	-0.95%	-0.88%	
VEA-VD-162	LTHRPWLS 138 kV Bus		B	L-1	-6.44%	-0.92%	-0.85%	
VEA-VD-163	MERCRYSW 138 kV Bus		B	L-1	-5.32%	-0.75%	-0.70%	
VEA-VD-164	MERCURY 138 kV Bus		B	L-1	-5.32%	-0.76%	-0.70%	
VEA-VD-165	NTSCANYN 138 kV Bus		B	L-1	-6.24%	-0.90%	-0.83%	
VEA-VD-166	RAINIER 138 kV Bus		B	L-1	-6.04%	-0.86%	-0.80%	
VEA-VD-167	STOCKADE 138 kV Bus		B	L-1	-6.12%	-0.89%	-0.81%	
VEA-VD-168	VALLEYNT 138 kV Bus		B	L-1	-5.97%	-0.86%	-0.79%	
VEA-VD-169	VALLEYTP 138 kV Bus		B	L-1	-6.53%	-0.93%	-0.86%	
VEA-VD-170	VALLEYVE 138 kV Bus		B	L-1	-6.53%	-0.93%	-0.86%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-171	VISTA 138 kV Bus		B	L-1	-7.21%	-0.91%	-0.83%	
VEA-VD-172	YUCCAFLT 138 kV Bus		B	L-1	-5.80%	-0.83%	-0.77%	
VEA-VD-173	CHARLSTN 138 kV Bus		B	L-1	-13.19%	-1.60%	-1.30%	
VEA-VD-174	GAMEBIRD 138 kV Bus	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Circuit 1	B	L-1	-13.09%	-2.56%	-2.29%	Prior to Charleston-Vista 138 kV line, adopt interim 8% voltage deviation criteria and work with WAPA to boost 138 kV bus voltage by re-setting NLTC of Amargosa bank
VEA-VD-175	SANDY 138 kV Bus		B	L-1	-10.46%	-2.03%	-1.79%	
VEA-VD-176	THSNDAIR 138 kV Bus		B	L-1	-13.14%	-2.28%	-2.01%	
VEA-VD-177	PAHRUMP_1 230 kV Bus	Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Circuit 1	B	L-1	-4.24%	-4.11%	-5.40%	be waived due to non-load bus by requests, or consider higher voltage deviation criteria (7%)
VEA-VD-178	PAHRUMP_1 230 kV Bus	Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Circuit 1	B	L-1	-3.68%	-3.54%	-5.06%	be waived due to non-load bus by requests, or consider higher voltage deviation criteria (7%)
VEA-VD-179	CHARLSTN 138 kV Bus		C	Breaker Failure	-13.20%	-9.79%	-9.71%	
VEA-VD-180	GAMEBIRD 138 kV Bus		C	Breaker Failure	-13.10%	-10.16%	-10.06%	
VEA-VD-181	GAMEBIRD_PST138 kV Bus		C	Breaker Failure	-13.09%	-10.16%	-10.04%	
VEA-VD-182	JOHNNIE 138 kV Bus	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Flt	C	Breaker Failure	-7.16%	-9.18%	-9.16%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-VD-183	SANDY 138 kV Bus		C	Breaker Failure	-10.47%	-8.17%	-8.03%	
VEA-VD-184	THSNDAIR 138 kV Bus		C	Breaker Failure	-13.15%	-10.08%	-9.98%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-185	VISTA 138 kV Bus		C	Breaker Failure	-7.17%	-9.44%	-9.40%	
VEA-VD-186	AMARGOSA 138 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	-6.50%	-6.97%	-7.82%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-187	BEATTY 138 kV Bus		C	L-1/L-1	-15.91%	-16.98%	-19.30%	
VEA-VD-188	BONDGDTP 138 kV Bus		C	L-1/L-1	-15.91%	-16.97%	-19.28%	
VEA-VD-189	CHARLSTN 138 kV Bus		C	L-1/L-1	-19.20%	-20.00%	-22.68%	
VEA-VD-190	DESERT VIEW 230 kV Bus		C	L-1/L-1	-24.05%	-26.14%	-27.25%	
VEA-VD-191	FRENCHMN 138 kV Bus		C	L-1/L-1	-12.64%	-13.54%	-15.15%	
VEA-VD-192	GAMEBIRD 138 kV Bus		C	L-1/L-1	-19.03%	-19.98%	-22.60%	
VEA-VD-193	GROOM LK 138 kV Bus		C	L-1/L-1	-13.65%	-14.62%	-16.41%	
VEA-VD-194	IND SPR 138 kV Bus		C	L-1/L-1	-7.07%	-7.66%	-8.38%	
VEA-VD-195	IS TAP 138 kV Bus		C	L-1/L-1	-7.07%	-7.66%	-8.37%	
VEA-VD-196	JACKASSF 138 kV Bus		C	L-1/L-1	-14.75%	-15.76%	-17.78%	
VEA-VD-197	JOHNNIE 138 kV Bus		C	L-1/L-1	-18.38%	-19.53%	-22.21%	
VEA-VD-198	LTHRPWLS 138 kV Bus		C	L-1/L-1	-15.83%	-16.88%	-19.18%	
VEA-VD-199	MERCYSW 138 kV Bus		C	L-1/L-1	-12.00%	-12.86%	-14.36%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-200	MERCURY 138 kV Bus		C	L-1/L-1	-12.00%	-12.87%	-14.36%	
VEA-VD-201	NTSCANYN 138 kV Bus		C	L-1/L-1	-14.59%	-15.59%	-17.58%	
VEA-VD-202	PAHRUMP 138 kV Bus		C	L-1/L-1	-19.68%	-20.70%	-23.41%	
VEA-VD-203	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-24.18%	-26.27%	-28.42%	
VEA-VD-204	RAINIER 138 kV Bus		C	L-1/L-1	-13.82%	-14.79%	-16.61%	
VEA-VD-205	SANDY 138 kV Bus		C	L-1/L-1	-15.58%	-16.47%	-18.55%	
VEA-VD-206	STOCKADE 138 kV Bus		C	L-1/L-1	-14.03%	-15.02%	-16.87%	
VEA-VD-207	THSND AIR 138 kV Bus		C	L-1/L-1	-19.12%	-20.03%	-22.68%	
VEA-VD-208	VALLEYNT 138 kV Bus		C	L-1/L-1	-13.65%	-14.61%	-16.40%	
VEA-VD-209	VALLEYTP 138 kV Bus		C	L-1/L-1	-16.61%	-17.70%	-20.17%	
VEA-VD-210	VALLEYVE 138 kV Bus		C	L-1/L-1	-16.63%	-17.71%	-20.20%	
VEA-VD-211	VISTA 138 kV Bus		C	L-1/L-1	-18.73%	-19.88%	-22.57%	
VEA-VD-212	YUCCAFLT 138 kV Bus		C	L-1/L-1	-13.19%	-14.12%	-15.83%	
VEA-VD-213	DESERT VIEW 230 kV Bus		C	L-1/L-1	-24.05%	-26.14%	-27.25%	
VEA-VD-214	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-24.18%	-26.27%	-28.42%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-215	CRAZY EYE TP230 kV Bus	Line N WEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-23.64%	-25.64%	-28.00%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-216	DESERT VIEW 230 kV Bus		C	L-1/L-1	-22.95%	-25.01%	-26.10%	
VEA-VD-217	LTHRPWLS 138 kV Bus		C	L-1/L-1	-15.06%	-16.07%	-18.31%	
VEA-VD-218	MERCURYSW 138 kV Bus		C	L-1/L-1	-11.47%	-12.31%	-13.76%	
VEA-VD-219	MERCURY 138 kV Bus		C	L-1/L-1	-11.48%	-12.32%	-13.76%	
VEA-VD-220	NTSCANYN 138 kV Bus		C	L-1/L-1	-13.92%	-14.89%	-16.82%	
VEA-VD-221	PAHRUMP 138 kV Bus		C	L-1/L-1	-18.62%	-19.59%	-22.23%	
VEA-VD-222	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-23.10%	-25.15%	-27.29%	
VEA-VD-223	RAINIER 138 kV Bus		C	L-1/L-1	-13.21%	-14.14%	-15.91%	
VEA-VD-224	STOCKADE 138 kV Bus		C	L-1/L-1	-13.41%	-14.36%	-16.16%	
VEA-VD-225	THSND AIR 138 kV Bus		C	L-1/L-1	-18.09%	-18.97%	-21.54%	
VEA-VD-226	VALLEYNT 138 kV Bus		C	L-1/L-1	-13.04%	-13.97%	-15.71%	
VEA-VD-227	VALLEYTP 138 kV Bus		C	L-1/L-1	-15.77%	-16.82%	-19.22%	
VEA-VD-228	VALLEYVE 138 kV Bus		C	L-1/L-1	-15.79%	-16.83%	-19.24%	
VEA-VD-229	VISTA 138 kV Bus		C	L-1/L-1	-17.73%	-18.83%	-21.44%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-230	YUCCAFLT 138 kV Bus		C	L-1/L-1	-12.61%	-13.50%	-15.17%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-231	CRAZY EYE TP230 kV Bus		C	L-1/L-1	-23.64%	-25.64%	-28.00%	
VEA-VD-232	DESERT VIEW 230 kV Bus		C	L-1/L-1	-22.95%	-25.01%	-26.10%	
VEA-VD-233	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-23.10%	-25.15%	-27.29%	
VEA-VD-234	BEATTY 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	-19.75%	-20.61%	-23.78%	
VEA-VD-235	GROOM LK 138 kV Bus		C	L-1/L-1	-16.69%	-17.41%	-19.95%	
VEA-VD-236	JACKASSF 138 kV Bus		C	L-1/L-1	-18.13%	-18.91%	-21.73%	
VEA-VD-237	JOHNNIE 138 kV Bus		C	L-1/L-1	-23.08%	-24.07%	-27.65%	
VEA-VD-238	LTHRPWLS 138 kV Bus		C	L-1/L-1	-19.65%	-20.49%	-23.63%	
VEA-VD-239	MERCRYSW 138 kV Bus		C	L-1/L-1	-14.64%	-15.23%	-17.43%	
VEA-VD-240	MERCURY 138 kV Bus		C	L-1/L-1	-14.64%	-15.25%	-17.44%	
VEA-VD-241	NTSCANYN 138 kV Bus		C	L-1/L-1	-17.91%	-18.69%	-21.46%	
VEA-VD-242	PAHRUMP 138 kV Bus		C	L-1/L-1	-24.90%	-25.73%	-29.32%	
VEA-VD-243	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-29.43%	-31.35%	-34.06%	
VEA-VD-244	RAINIER 138 kV Bus		C	L-1/L-1	-16.90%	-17.62%	-20.20%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-245	SANDY 138 kV Bus		C	L-1/L-1	-19.63%	-20.37%	-23.18%	
VEA-VD-246	STOCKADE 138 kV Bus		C	L-1/L-1	-17.16%	-17.91%	-20.53%	
VEA-VD-247	THSND AIR 138 kV Bus		C	L-1/L-1	-24.17%	-24.87%	-28.40%	
VEA-VD-248	VALLEYNT 138 kV Bus		C	L-1/L-1	-16.68%	-17.40%	-19.94%	
VEA-VD-249	VALLEYTP 138 kV Bus		C	L-1/L-1	-20.76%	-21.66%	-25.00%	
VEA-VD-250	VALLEYVE 138 kV Bus		C	L-1/L-1	-20.78%	-21.68%	-25.03%	
VEA-VD-251	VISTA 138 kV Bus		C	L-1/L-1	-23.65%	-24.66%	-28.23%	
VEA-VD-252	YUCCAFLT 138 kV Bus		C	L-1/L-1	-16.11%	-16.79%	-19.24%	
VEA-VD-253	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-29.43%	-31.35%	-34.06%	
VEA-VD-254	BEATTY 138 kV Bus			C	L-1/L-1	-19.03%	-19.83%	
VEA-VD-255	GROOM LK 138 kV Bus	C		L-1/L-1	-16.12%	-16.79%	-19.25%	
VEA-VD-256	JACKASSF 138 kV Bus	C		L-1/L-1	-17.50%	-18.22%	-20.94%	
VEA-VD-257	JOHNNIE 138 kV Bus	C		L-1/L-1	-22.19%	-23.12%	-26.56%	
VEA-VD-258	LTHRPWLS 138 kV Bus	C		L-1/L-1	-18.93%	-19.72%	-22.74%	
VEA-VD-259	MERCYSW 138 kV Bus	C		L-1/L-1	-14.14%	-14.70%	-16.82%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-260	MERCURY 138 kV Bus	Line PAHRUMP_1 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-14.15%	-14.71%	-16.82%	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-VD-261	NTSCANYN 138 kV Bus		C	L-1/L-1	-17.29%	-18.01%	-20.68%	
VEA-VD-262	PAHRUMP 138 kV Bus		C	L-1/L-1	-23.91%	-24.69%	-28.15%	
VEA-VD-263	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-28.44%	-30.30%	-32.94%	
VEA-VD-264	RAINIER 138 kV Bus		C	L-1/L-1	-16.32%	-16.99%	-19.48%	
VEA-VD-265	SANDY 138 kV Bus		C	L-1/L-1	-18.88%	-19.57%	-22.26%	
VEA-VD-266	STOCKADE 138 kV Bus		C	L-1/L-1	-16.58%	-17.27%	-19.80%	
VEA-VD-267	THSNDAIR 138 kV Bus		C	L-1/L-1	-23.22%	-23.87%	-27.26%	
VEA-VD-268	VALLEYNT 138 kV Bus		C	L-1/L-1	-16.11%	-16.78%	-19.23%	
VEA-VD-269	VALLEYTP 138 kV Bus		C	L-1/L-1	-19.98%	-20.82%	-24.04%	
VEA-VD-270	VALLEYVE 138 kV Bus		C	L-1/L-1	-20.00%	-20.83%	-24.07%	
VEA-VD-271	VISTA 138 kV Bus		C	L-1/L-1	-22.73%	-23.66%	-27.11%	
VEA-VD-272	YUCCAFLT 138 kV Bus		C	L-1/L-1	-15.57%	-16.19%	-18.56%	
VEA-VD-273	CRAZY EYE TP230 kV Bus		C	L-1/L-1	-28.99%	-30.79%	-33.66%	
VEA-VD-274	PAHRUMP_1 230 kV Bus		C	L-1/L-1	-28.44%	-30.30%	-32.94%	

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-275	BEATTY 138 kV Bus	Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 1 0.00_Tran PAHRUMP_1 230.00 to PAHRUMP 138.00 Ckt 2 0.00	C	T-1/T-1	-19.60%	-20.88%	-23.57%	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project
VEA-VD-276	BONDGDTP 138 kV Bus		C	T-1/T-1	-19.59%	-20.87%	-23.55%	
VEA-VD-277	CHARLSTN 138 kV Bus		C	T-1/T-1	-24.13%	-25.05%	-28.19%	
VEA-VD-278	FRENCHMN 138 kV Bus		C	T-1/T-1	-15.28%	-16.35%	-18.20%	
VEA-VD-279	GAMEBIRD 138 kV Bus		C	T-1/T-1	-23.91%	-25.03%	-28.10%	
VEA-VD-280	GROOM LK 138 kV Bus		C	T-1/T-1	-16.54%	-17.69%	-19.75%	
VEA-VD-281	JACKASSF 138 kV Bus		C	T-1/T-1	-17.97%	-19.19%	-21.52%	
VEA-VD-282	JOHNNIE 138 kV Bus		C	T-1/T-1	-22.93%	-24.31%	-27.44%	
VEA-VD-283	LTHRPWLS 138 kV Bus		C	T-1/T-1	-19.49%	-20.76%	-23.42%	
VEA-VD-284	MERCRYSW 138 kV Bus		C	T-1/T-1	-14.48%	-15.51%	-17.23%	
VEA-VD-285	MERCURY 138 kV Bus		C	T-1/T-1	-14.49%	-15.53%	-17.24%	
VEA-VD-286	NTSCANYN 138 kV Bus		C	T-1/T-1	-17.76%	-18.96%	-21.25%	
VEA-VD-287	PAHRUMP 138 kV Bus		C	T-1/T-1	-24.75%	-25.95%	-29.12%	
VEA-VD-288	RAINIER 138 kV Bus		C	T-1/T-1	-16.74%	-17.90%	-20.00%	
VEA-VD-289	SANDY 138 kV Bus		C	T-1/T-1	-19.51%	-20.54%	-23.01%	

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Study Area: **Valley Electric Association - Summer Peak**



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-VD-290	STOCKADE 138 kV Bus		C	T-1/T-1	-17.01%	-18.19%	-20.32%	
VEA-VD-291	THSNDAIR 138 kV Bus		C	T-1/T-1	-24.03%	-25.09%	-28.20%	
VEA-VD-292	VALLEYNT 138 kV Bus		C	T-1/T-1	-16.53%	-17.68%	-19.74%	
VEA-VD-293	VALLEYTP 138 kV Bus		C	T-1/T-1	-20.61%	-21.92%	-24.79%	
VEA-VD-294	VALLEYVE 138 kV Bus		C	T-1/T-1	-20.63%	-21.94%	-24.82%	
VEA-VD-295	VISTA 138 kV Bus		C	T-1/T-1	-23.51%	-24.89%	-28.03%	
VEA-VD-296	YUCCAFLT 138 kV Bus		C	T-1/T-1	-15.96%	-17.07%	-19.04%	
VEA-VD-297	BOB TAP 230 kV Bus		Tran ELDORDO 500.0 to ELDORDO2 230.0 Ckt 1_Line MEAD S 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	-2.66%	-11.31%	
VEA-VD-298	ELDORDO2 230 kV Bus	C		L-1/L-1	0.00%	-11.14%	-11.47%	
VEA-VD-299	PAHRUMP_1 230 kV Bus	C		L-1/L-1	-1.65%	-10.44%	-10.19%	

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-139	CHARLSTN 138 kV Bus	Line PAHRUMP 138.0 to GAMEBIRD 138.0 Circuit 1	B	L-1	0.89	1.00	1.00	Prior to Charleston-Vista 138 kV line, work with WAPA to re-set NLTC of Amargosa bank
VEA-V-140	GAMEBIRD 138 kV Bus		B	L-1	0.89	1.00	1.00	
VEA-V-141	THSND AIR 138 kV Bus		B	L-1	0.89	1.00	1.00	
VEA-V-142	CHARLSTN 138 kV Bus	Brkr Fail PAHRUMP-VISTA 138 & PAHRUMP-GAMEBIRD 138 1.000 CatC BKR Fit	C	Breaker Failure	0.89	0.92	0.92	Eliminated by the Innovation-Mercury Switch 138 kV Line and Innovation 230/138 kV Sub project.
VEA-V-143	GAMEBIRD 138 kV Bus		C	Breaker Failure	0.89	0.92	0.92	
VEA-V-144	GAMEBIRD_PST138 kV Bus		C	Breaker Failure	0.89	0.92	0.92	
VEA-V-145	THSND AIR 138 kV Bus		C	Breaker Failure	0.89	0.92	0.92	
VEA-V-146	BEATTY 138 kV Bus	Line N WEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line PAHRUMP_1 230.0 to CRAZY EYE TP 230.0 Ckt 1	C	L-1/L-1	0.86	0.85	0.83	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-V-147	BONDGDTP 138 kV Bus		C	L-1/L-1	0.86	0.85	0.83	
VEA-V-148	CHARLSTN 138 kV Bus		C	L-1/L-1	0.83	0.82	0.79	
VEA-V-149	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.76	0.75	0.72	
VEA-V-150	FRENCHMN 138 kV Bus		C	L-1/L-1	0.89	0.88	0.87	
VEA-V-151	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.83	0.82	0.79	
VEA-V-152	GROOM LK 138 kV Bus		C	L-1/L-1	0.89	0.88	0.86	
VEA-V-153	JACKASSF 138 kV Bus		C	L-1/L-1	0.87	0.86	0.85	
VEA-V-154	JOHNNIE 138 kV Bus		C	L-1/L-1	0.84	0.83	0.80	
VEA-V-155	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.87	0.86	0.83	
VEA-V-156	MERCRYSW 138 kV Bus		C	L-1/L-1	0.89	0.89	0.88	
VEA-V-157	MERCURY 138 kV Bus		C	L-1/L-1	0.89	0.89	0.88	
VEA-V-158	NTSCANYN 138 kV Bus		C	L-1/L-1	0.87	0.87	0.85	
VEA-V-159	PAHRUMP 138 kV Bus		C	L-1/L-1	0.83	0.82	0.79	
VEA-V-160	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.75	0.74	0.71	
VEA-V-161	RAINIER 138 kV Bus		C	L-1/L-1	0.88	0.88	0.86	
VEA-V-162	SANDY 138 kV Bus		C	L-1/L-1	0.86	0.85	0.83	
VEA-V-163	THSND AIR 138 kV Bus	C	L-1/L-1	0.83	0.82	0.79		
VEA-V-164	VALLEYNT 138 kV Bus	C	L-1/L-1	0.89	0.88	0.86		
VEA-V-165	VALLEYTP 138 kV Bus	C	L-1/L-1	0.86	0.85	0.82		

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	
VEA-V-166	VALLEYVE 138 kV Bus		C	L-1/L-1	0.86	0.85	0.82	operate the 138 kV system in radial with three independent supplies from Amargosa, Pahrump, and Jackass Flat transmission sources after first contingency to isolate potential impact on the vicinity area (Zone 183/187)
VEA-V-167	VISTA 138 kV Bus		C	L-1/L-1	0.84	0.82	0.79	
VEA-V-168	YUCCAFLT 138 kV Bus		C	L-1/L-1	0.89	0.88	0.87	
VEA-V-169	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.76	0.75	0.72	
VEA-V-170	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.75	0.74	0.71	
VEA-V-171	BEATTY 138 kV Bus	Line NWEST 230.0 to DESERT VIEW 230.0 Ckt 1_Line CRAZY EYE TP 230.0 to BOB TAP 230.0 Ckt 1	C	L-1/L-1	0.87	0.86	0.84	
VEA-V-172	BONDGDTP 138 kV Bus		C	L-1/L-1	0.87	0.86	0.84	
VEA-V-173	CHARLSTN 138 kV Bus		C	L-1/L-1	0.84	0.83	0.80	
VEA-V-174	CRAZY EYE TP230 kV Bus		C	L-1/L-1	0.77	0.76	0.73	
VEA-V-175	DESERT VIEW 230 kV Bus		C	L-1/L-1	0.77	0.76	0.73	
VEA-V-176	FRENCHMN 138 kV Bus		C	L-1/L-1	0.90	0.89	0.88	
VEA-V-177	GAMEBIRD 138 kV Bus		C	L-1/L-1	0.84	0.83	0.81	
VEA-V-178	GROOM LK 138 kV Bus		C	L-1/L-1	0.89	0.88	0.87	
VEA-V-179	JACKASSF 138 kV Bus		C	L-1/L-1	0.88	0.87	0.85	
VEA-V-180	JOHNNIE 138 kV Bus		C	L-1/L-1	0.85	0.84	0.81	
VEA-V-181	LTHRPWLS 138 kV Bus		C	L-1/L-1	0.87	0.86	0.84	
VEA-V-182	MERCURYSW 138 kV Bus		C	L-1/L-1	0.90	0.89	0.88	
VEA-V-183	MERCURY 138 kV Bus		C	L-1/L-1	0.90	0.89	0.88	
VEA-V-184	NTSCANYN 138 kV Bus		C	L-1/L-1	0.88	0.87	0.86	
VEA-V-185	PAHRUMP 138 kV Bus		C	L-1/L-1	0.84	0.83	0.80	
VEA-V-186	PAHRUMP_1 230 kV Bus		C	L-1/L-1	0.77	0.75	0.73	
VEA-V-187	RAINIER 138 kV Bus	C	L-1/L-1	0.89	0.88	0.87		
VEA-V-188	SANDY 138 kV Bus	C	L-1/L-1	0.87	0.86	0.84		
VEA-V-189	THSNDAIR 138 kV Bus	C	L-1/L-1	0.84	0.83	0.80		
VEA-V-190	VALLEYNT 138 kV Bus	C	L-1/L-1	0.89	0.88	0.87		
VEA-V-191	VALLEYTP 138 kV Bus	C	L-1/L-1	0.87	0.86	0.83		
VEA-V-192	VALLEYVE 138 kV Bus	C	L-1/L-1	0.87	0.86	0.83		
VEA-V-193	VISTA 138 kV Bus	C	L-1/L-1	0.85	0.83	0.81		
VEA-V-194	YUCCAFLT 138 kV Bus	C	L-1/L-1	0.89	0.89	0.87		
VEA-V-195	CRAZY EYE TP230 kV Bus	C	L-1/L-1	0.77	0.76	0.73		
VEA-V-196	DESERT VIEW 230 kV Bus	C	L-1/L-1	0.77	0.76	0.73		

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Study Area: **Valley Electric Association - Summer Peak**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2014 Summer Peak	2017 Summer Peak	2022 Summer Peak	

No single source substation with more than 100 MW Load