

2013/2014 ISO Reliability Assessment - Preliminary Study Results

Study Area: **PG&E Central Valley Stockton - Summer Off-Peak & Summer Light Load**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-T-1	Stanislaus-Melones-Manteca 115 kV Line No. 1	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	132	<100		Dispatch local generator
STOC-NP-T-2	Riverbank Jct - Manteca 115 kV Line	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	116	<100		Dispatch local generator
STOC-NP-T-3	Ripon - Riverbank Jct 115 kV Line	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	129	<100		Dispatch local generator
STOC-NP-T-4	Bellota-Riverbank-Melones 115 kV Line	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	105	<100		Dispatch local generator
STOC-NP-T-5	Stanislaus - Melones Sw 115 kV Line	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	138	<100		Dispatch local generator
STOC-NP-T-6	Stanislaus-Melones-Manteca 115 kV Line No. 1	Bellota-Riverbank-Melones 115 kV Line & Stanislaus - Melones Sw 115 kV Line	C3	N-1-1	<100	110		Generation redispatch
STOC-NP-T-7	Ripon - Riverbank Jct 115 kV Line	Stanislaus-Melones-Manteca 115 kV Line No. 1 & Bellota-Riverbank-Melones 115 kV Line	C3	N-1-1	<100	103		Generation redispatch
STOC-NP-T-8	Stanislaus - Melones Sw 115 kV Line	Stanislaus-Melones-Manteca 115 kV Line No. 1 & Bellota-Riverbank-Melones 115 kV Line	C3	N-1-1	<100	107		Generation redispatch

San Onofre Nuclear Generation Station was retired on June 7, 2013 and therefore was removed from the base cases used for the 2013/14 ISO transmission planning process.

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Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-VD-1	AVENA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.2	<10.0		Interim operating solution
STOC-NP-VD-2	BANTA 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.9	<10.0		Interim operating solution
STOC-NP-VD-3	CALVO 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.8	<10.0		Interim operating solution
STOC-NP-VD-4	RIPON 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	27.4	<10.0		Interim operating solution
STOC-NP-VD-5	TRACY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	32.1	<10.0		Interim operating solution
STOC-NP-VD-6	LOUISE 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.5	<10.0		Interim operating solution
STOC-NP-VD-7	VIERRA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	30.9	<10.0		Interim operating solution
STOC-NP-VD-8	AEC_300 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	33.2	<10.0		Interim operating solution
STOC-NP-VD-9	CARBONA 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	27.1	<10.0		Interim operating solution
STOC-NP-VD-10	GRANITE 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	29.0	<10.0		Interim operating solution
STOC-NP-VD-11	LAMMERS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	32.6	<10.0		Interim operating solution
STOC-NP-VD-12	LEPRINO 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	32.1	<10.0		Interim operating solution
STOC-NP-VD-13	MANTECA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	30.1	<10.0		Interim operating solution
STOC-NP-VD-14	SAFEWAY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	32.9	<10.0		Interim operating solution
STOC-NP-VD-15	BNTA CRB 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.6	<10.0		Interim operating solution

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-VD-16	CL AMMNA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	31.0	<10.0		Interim operating solution
STOC-NP-VD-17	ELLS GTY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	33.4	<10.0		Interim operating solution
STOC-NP-VD-18	FROGTOWN 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	16.4	<10.0		Interim operating solution
STOC-NP-VD-19	GRONMYER 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.4	<10.0		Interim operating solution
STOC-NP-VD-20	LYOTH-SP 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.9	<10.0		Interim operating solution
STOC-NP-VD-21	OI GLASS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	32.6	<10.0		Interim operating solution
STOC-NP-VD-22	STANISLS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	17.2	<10.0		Interim operating solution
STOC-NP-VD-23	CH.STN 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	10.4	<10.0		Interim operating solution
STOC-NP-VD-24	MILLER 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	28.1	<10.0		Interim operating solution
STOC-NP-VD-25	NEWMAN 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	24.8	<10.0		Interim operating solution
STOC-NP-VD-26	PEORIA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	10.7	<10.0		Interim operating solution
STOC-NP-VD-27	GUSTINE 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	24.2	<10.0		Interim operating solution
STOC-NP-VD-28	R.TRACK 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	12.0	<10.0		Interim operating solution
STOC-NP-VD-29	WESTLEY 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	26.9	<10.0		Interim operating solution
STOC-NP-VD-30	CRWS LDG 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	25.9	<10.0		Interim operating solution

Study Area: **PG&E Central Valley Stockton - Summer Off-Peak & Summer Light Load**



Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-VD-31	INGRM C. 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	29.1	<10.0		Interim operating solution
STOC-NP-VD-32	TEICHERT 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	29.0	<10.0		Interim operating solution
STOC-NP-VD-33	VALLY HM 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	24.0	<10.0		Interim operating solution

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-1	TESLA 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-2	TRACY 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-3	KASSON 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-4	VIERRA 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-5	AEC_300 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-6	CAMANCH 230 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-7	FAYETTE 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-8	GRANITE 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-9	HERDLYN 60 kV	Normal	A	N-0	1.07	<1.05	-	Under review for possible exemption
STOC-NP-V-10	LAMMERS 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-11	LEPRINO 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-12	SAFEWAY 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-13	SCHULTE 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-14	TESLA D 230 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-15	TESLA E 230 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-16	ALTENRGY 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-17	B.BTHNY- 60 kV	Normal	A	N-0	1.07	<1.05	-	Under review for possible exemption
STOC-NP-V-18	CAMANCPP 230 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-19	CATARACT 115 kV	Normal	A	N-0	1.05	1.07	-	Under review for possible exemption
STOC-NP-V-20	CL AMMNA 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-21	ELLS GTY 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-22	FROGTOWN 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-23	GWFTACY 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-24	HJ HEINZ 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-25	MCD_ISLE 60 kV	Normal	A	N-0	<1.05	1.08	-	Under review for possible exemption
STOC-NP-V-26	MDL_RIVR 60 kV	Normal	A	N-0	<1.05	1.08	-	Under review for possible exemption
STOC-NP-V-27	OI GLASS 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-28	SOUTH BY 60 kV	Normal	A	N-0	1.08	<1.05	-	Under review for possible exemption
STOC-NP-V-29	SP CMPNY 115 kV	Normal	A	N-0	<1.05	1.05	-	Under review for possible exemption
STOC-NP-V-30	STANISLS 115 kV	Normal	A	N-0	1.06	1.07	-	Under review for possible exemption

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-31	TESLA &1 230 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-32	TH.E.DV. 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-33	TOSCO-PP 60 kV	Normal	A	N-0	1.08	<1.05	-	Under review for possible exemption
STOC-NP-V-34	USWP-PAT 115 kV	Normal	A	N-0	<1.05	1.07	-	Under review for possible exemption
STOC-NP-V-35	WEST SDE 60 kV	Normal	A	N-0	1.07	<1.05	-	Under review for possible exemption
STOC-NP-V-36	MILLER 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-37	SALADO 60 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-38	SALADO 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-39	SANDBAR 115 kV	Normal	A	N-0	1.06	1.06	-	Under review for possible exemption
STOC-NP-V-40	BEARDSLY 115 kV	Normal	A	N-0	1.06	1.06	-	Under review for possible exemption
STOC-NP-V-41	CRWS LDG 60 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-42	DONNELLS 115 kV	Normal	A	N-0	1.06	1.07	-	Under review for possible exemption
STOC-NP-V-43	INGRM C. 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-44	MDSTO CN 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-45	PATTERSN 60 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption

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High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-46	RVRBK J2 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-47	SJ COGEN 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-48	SPRNG GP 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-49	SPRNG GP 115 kV	Normal	A	N-0	1.06	<1.05	-	Under review for possible exemption
STOC-NP-V-50	STNSLSRP 60 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-51	TEICHERT 115 kV	Normal	A	N-0	<1.05	1.06	-	Under review for possible exemption
STOC-NP-V-52	AVENA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.77	>0.9	-	Interim operating solution
STOC-NP-V-53	BANTA 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.78	>0.9	-	Interim operating solution
STOC-NP-V-54	CALVO 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.78	>0.9	-	Interim operating solution
STOC-NP-V-55	RIPON 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.75	>0.9	-	Interim operating solution
STOC-NP-V-56	TRACY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-57	LOUISE 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.79	>0.9	-	Interim operating solution
STOC-NP-V-58	VIERRA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.72	>0.9	-	Interim operating solution
STOC-NP-V-59	AEC_300 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-60	CARBONA 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.77	>0.9	-	Interim operating solution

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Study Area: **PG&E Central Valley Stockton - Summer Off-Peak & Summer Light Load**



High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-61	GRANITE 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.75	>0.9	-	Interim operating solution
STOC-NP-V-62	LAMMERS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-63	LEPRINO 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-64	MANTECA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.73	>0.9	-	Interim operating solution
STOC-NP-V-65	SAFEWAY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-66	BNTA CRB 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.77	>0.9	-	Interim operating solution
STOC-NP-V-67	CL AMMNA 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.72	>0.9	-	Interim operating solution
STOC-NP-V-68	ELLS GTY 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-69	FROGTOWN 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.88	>0.9	-	Interim operating solution
STOC-NP-V-70	GRONMYER 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.79	>0.9	-	Interim operating solution
STOC-NP-V-71	LYOTH-SP 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.78	>0.9	-	Interim operating solution
STOC-NP-V-72	OI GLASS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.71	>0.9	-	Interim operating solution
STOC-NP-V-73	STANISLS 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.89	>0.9	-	Interim operating solution
STOC-NP-V-74	MILLER 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.75	>0.9	-	Interim operating solution
STOC-NP-V-75	NEWMAN 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.77	>0.9	-	Interim operating solution

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Study Area: **PG&E Central Valley Stockton - Summer Off-Peak & Summer Light Load**

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
STOC-NP-V-76	GUSTINE 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.77	>0.9	-	Interim operating solution
STOC-NP-V-77	WESTLEY 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.76	>0.9	-	Interim operating solution
STOC-NP-V-78	CRWS LDG 60 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.76	>0.9	-	Interim operating solution
STOC-NP-V-79	INGRM C. 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.74	>0.9	-	Interim operating solution
STOC-NP-V-80	TEICHERT 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.75	>0.9	-	Interim operating solution
STOC-NP-V-81	VALLY HM 115 kV	TESLA 115 kV Bus 1 and Bus 2 - CB 102 Failure	C2	Stuck Bkr	0.79	>0.9	-	Interim operating solution

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Study Area: **PG&E Central Valley Stockton - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
STOC-SP-T-1	Valley Springs No. 1 60 kV Line	Weber - Mormon Jct 60 kV Line	B	L-1	110	117	128	Disable automatics
STOC-SP-T-2	Lockeford No. 1 60 kV Line	Hammer - Country Club 60 kV	B	L-1	165	176	191	Disable automatics
STOC-SP-T-3	Stagg - Hammer 60 kV Line No. 1	BUS FAULT AT 33704 STAGG 60.00 Section E	C1	Bus	153	<100	<100	Upgrade Stagg 60 kV bus
STOC-SP-T-4	Hammer - Country Club 60 kV	BUS FAULT AT 33704 STAGG 60.00 Section E	C1	Bus	106	107	114	Upgrade Stagg 60 kV bus
STOC-SP-T-5	Manteca 115/60 kV Transformer No. 3	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	188	192	200	New Kasson SPS
STOC-SP-T-6	Manteca - Louise 60 kV Line	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	147	148	155	New Kasson SPS
STOC-SP-T-7	Kasson - Louise 60 kV Line	BUS FAULT AT 33528 KASSON 115.00	C1	Bus	110	111	117	New Kasson SPS
STOC-SP-T-8	Bellota-Riverbank-Melones 115 kV Line	BELLOTA 230 kV Bus 1 and Bus 2 - CB 200 Failure	C2	Stuck Bkr	<100	<100	104	Rerate
STOC-SP-T-9	Stanislaus-Melones-Manteca 115 kV Line No. 1	Stanislaus - Melones Sw 115 kV Line & Stanislaus - Manteca 115 kV Line No. 2	C3	N-1-1	107	106	105	Existing SPS
STOC-SP-T-10	Stanislaus - Melones Sw 115 kV Line	Stanislaus-Melones-Manteca 115 kV Line No. 1 & Stanislaus - Manteca 115 kV Line No. 2	C3	N-1-1	107	106	105	Existing SPS
STOC-SP-T-11	Schulte - Kasson - Manteca 115 kV Line	Schulte - Lammers 115 kV Line & Tesla - Tracy 115 kV Line	C3	N-1-1	138	<100	<100	Interim operating solution
STOC-SP-T-12	Vierra - Tracy - Kasson 115 kV Line	Tesla - Kasson - Manteca 115 kV Line & Schulte - Lammers 115 kV Line	C3	N-1-1	129	<100	<100	Interim operating solution
STOC-SP-T-13	Tesla - Tracy 115 kV Line	Tesla - Kasson - Manteca 115 kV Line & Schulte - Lammers 115 kV Line	C3	N-1-1	126	<100	<100	Interim operating solution

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Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
STOC-SP-T-14	Stockton 'A' - Weber 60 kV Line No. 3	Stockton 'A' - Weber 60 kV Line No. 1 & Stockton 'A' - Weber 60 kV Line No. 2	C3	N-1-1	137	140	149	Reconductor
STOC-SP-T-15	Stagg - Country Club 60 kV Line No. 1	Stagg - Country Club 60 kV Line No. 2 & Stagg - Hammer 60 kV Line No. 1	C3	N-1-1	154	<100	<100	Interim operating solution
STOC-SP-T-16	Stagg - Country Club 60 kV Line No. 2	Stagg - Country Club 60 kV Line No. 1 & Stagg - Hammer 60 kV Line No. 1	C3	N-1-1	154	<100	<100	Interim operating solution
STOC-SP-T-17	Stagg - Hammer 60 kV Line No. 1	Stagg - Country Club 60 kV Line No. 1 & Stagg - Country Club 60 kV Line No. 2	C3	N-1-1	153	<100	<100	Interim operating solution
STOC-SP-T-18	Hammer - Country Club 60 kV	Stagg - Country Club 60 kV Line No. 2 & Stagg - Country Club 60 kV Line No. 1	C3	N-1-1	106	106	114	Rerate
STOC-SP-T-19	Lockeford 230/60 kV Transformer No. 2	Hammer - Country Club 60 kV & Lockeford 230/60 kV Transformer No. 3	C3	N-1-1	103	104	<100	Interim operating solution
STOC-SP-T-20	Lockeford 230/60 kV Transformer No. 3	Hammer - Country Club 60 kV & Lockeford 230/60 kV Transformer No. 2	C3	N-1-1	103	104	<100	Interim operating solution
STOC-SP-T-21	Lockeford - Lodi 60 kV Line No. 2	Lockeford - Industrial 60 kV Line & Lodi - Industrial 60 kV Line	C3	N-1-1	150	143	<100	Interim operating solution
STOC-SP-T-22	Lockeford - Lodi 60 kV Line No. 3	Lockeford - Lodi 60 kV Line No. 2 & Lockeford - Industrial 60 kV Line	C3	N-1-1	161	152	<100	Interim operating solution
STOC-SP-T-23	Lockeford - Lodi 60 kV Line No. 1	Lockeford - Lodi 60 kV Line No. 2 & Lockeford - Industrial 60 kV Line	C3	N-1-1	130	123	<100	Interim operating solution
STOC-SP-T-24	Lockeford No. 1 60 kV Line	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	187	191	<100	Interim operating solution
STOC-SP-T-25	Stanislaus - Manteca 115 kV Line No. 2	Stanislaus - Melones Sw 115 kV Line & Stanislaus-Melones-Manteca 115 kV Line No. 1	C3	N-1-1	101	101	100	Existing SPS
STOC-SP-T-26	Stanislaus - Melones Sw 115 kV Line	Stanislaus-Melones-Manteca No.1 115 kV & Stanislaus-Mantec	C5	DCTL	107	106	105	Existing SPS

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Study Area: **PG&E Central Valley Stockton - Summer Peak**



Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
STOC-SP-T-27	Stanislaus-Melones-Manteca 115 kV Line No. 1	Stanislaus-Manteca No.2 115 kV & Stanislaus-Melones-Riverb	C5	DCTL	107	106	105	Existing SPS
STOC-SP-T-28	Stanislaus - Melones Sw 115 kV Line	Stanislaus-Melones-Manteca No.1 115 kV & Stanislaus-Mantec	C5	DCTL	107	106	105	Existing SPS
STOC-SP-T-29	Hammer - Country Club 60 kV	Stagg-Hammer 60 kV Line Nos. 1 & 2 (new)	C5	DCTL	<100	<100	106	Rerate

San Onofre Nuclear Generation Station was retired on June 7, 2013 and therefore was removed from the base cases used for the 2013/14 ISO transmission planning process.

Study Area: **PG&E Central Valley Stockton - Summer Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
STOC-SP-VD-1	MSHR 60V 60 kV	Hammer - Country Club 60 kV	B	L-1	6.7	8.8	8.4	Disable automatics
STOC-SP-VD-2	WEST PNT 60 kV	WEST PNT 11.50 Unit ID 1	B	G-1	6.1	<5.0	<5.0	Adjust West Point gen terminal voltage

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
STOC-SP-V-1	DONNELLS 115 kV	Normal	A	N-0	1.06	1.06	1.05	Under review for possible exemption
STOC-SP-V-2	LODI 60 kV	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	0.87	>0.9	>0.9	Interim operating solution
STOC-SP-V-3	COLONY 60 kV	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	0.88	>0.9	>0.9	Interim operating solution
STOC-SP-V-4	VICTOR 60 kV	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	0.88	>0.9	>0.9	Interim operating solution
STOC-SP-V-5	MONDAVI 60 kV	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	0.87	>0.9	>0.9	Interim operating solution
STOC-SP-V-6	MSHR 60V 60 kV	Lockeford - Bellota 230 kV Line & Hammer - Country Club 60 kV	C3	N-1-1	0.78	0.85	>0.9	Interim operating solution

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Study Area: **PG&E Central Valley Stockton - Summer Peak**



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)			Potential Mitigation Solutions
				2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	

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

Study Area: **PG&E Central Valley Stockton - Summer Peak**



Single Source Substation with more than 100 MW Load

ID	Substation	Load Served (MW)			Potential Mitigation Solutions
		2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	

No single source substation with more than 100 MW Load