

2013/2014 ISO Reliability Assessment - Preliminary Study Results

Study Area: **PG&E Central Valley Sacramento - 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	
SAC-NP-V-1	HALE 115 kV	Normal	A	N-0	1.07	1.07		Under review for possible exemption
SAC-NP-V-2	DAVIS 115 kV	Normal	A	N-0	<1.05	1.06		Under review for possible exemption
SAC-NP-V-3	HALE2 115 kV	Normal	A	N-0	1.07	1.07		Under review for possible exemption
SAC-NP-V-4	CAMPUS 115 kV	Normal	A	N-0	<1.05	1.06		Under review for possible exemption
SAC-NP-V-5	CORT_D 115 kV	Normal	A	N-0	1.07	1.06		Under review for possible exemption
SAC-NP-V-6	SUISUN 115 kV	Normal	A	N-0	1.07	1.07		Under review for possible exemption
SAC-NP-V-7	TRAVIS 115 kV	Normal	A	N-0	<1.05	1.07		Under review for possible exemption
SAC-NP-V-8	CORTINA 115 kV	Normal	A	N-0	1.07	1.06		Under review for possible exemption
SAC-NP-V-9	CORTINA 230 kV	Normal	A	N-0	<1.05	1.06		Under review for possible exemption
SAC-NP-V-10	JAMESON 115 kV	Normal	A	N-0	1.07	1.07		Under review for possible exemption
SAC-NP-V-11	MADISON 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-12	VACA-CB 115 kV	Normal	A	N-0	1.08	<1.05		Under review for possible exemption
SAC-NP-V-13	WINTERS 60 kV	Normal	A	N-0	1.07	<1.05		Under review for possible exemption
SAC-NP-V-14	AMERIGAS 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-15	BTAV-JCT 60 kV	Normal	A	N-0	1.08	<1.05		Under review for possible exemption
SAC-NP-V-16	CORDELIA 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-17	DIXONCAN 60 kV	Normal	A	N-0	1.07	<1.05		Under review for possible exemption
SAC-NP-V-18	DIXONCAN 115 kV	Normal	A	N-0	<1.05	1.06		Under review for possible exemption
SAC-NP-V-19	DIXONPGE 60 kV	Normal	A	N-0	1.07	<1.05		Under review for possible exemption
SAC-NP-V-20	DIXONPGE 115 kV	Normal	A	N-0	<1.05	1.07		Under review for possible exemption
SAC-NP-V-21	MAINE-PR 60 kV	Normal	A	N-0	1.08	<1.05		Under review for possible exemption

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					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
SAC-NP-V-22	PUTH CRK 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-23	SCHMLBCH 115 kV	Normal	A	N-0	1.07	1.07		Under review for possible exemption
SAC-NP-V-24	TRVS_HPT 115 kV	Normal	A	N-0	<1.05	1.07		Under review for possible exemption
SAC-NP-V-25	VACA-DIX 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-26	VACA-DXN 60 kV	Normal	A	N-0	1.08	<1.05		Under review for possible exemption
SAC-NP-V-27	VACAVLL1 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption
SAC-NP-V-28	VACAVLL2 115 kV	Normal	A	N-0	1.08	1.08		Under review for possible exemption

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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Study Area: **PG&E Central Valley Sacramento - 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	
SAC-SP-T-1	Brighton - Davis 115 kV Line	West Sacramento - Brighton 115 kV Line	B	L-1	106	<100	<100	Interim operating solution
SAC-SP-T-2	Vaca - Suisun - Jameson 115 kV Line	Vaca - Suisun 115 kV Line	B	L-1	<100	<100	102	Existing SPS
SAC-SP-T-3	Vaca Dixon 115/60 kV Transformer No. 5	Vaca Dixon 115/60 kV Transformer No. 9	B	T-1	119	<100	<100	Interim operating solution
SAC-SP-T-4	Cortina 60 kV Line No. 3	WADHAM Unit ID 1 & Cortina No. 4 60 kV Line	B	G-1/L-1	106	<100	<100	Interim operating solution
SAC-SP-T-5	Woodland - Davis 115 kV Line	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	188	<100	<100	Interim operating solution
SAC-SP-T-6	Rio Oso - Woodland 115 kV No. 2	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	112	<100	<100	Interim operating solution
SAC-SP-T-7	Rio Oso - Woodland 115 kV No. 1	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	110	<100	<100	Interim operating solution
SAC-SP-T-8	Rio Oso - West Sacramento 115 kV Line	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	158	<100	<100	Interim operating solution
SAC-SP-T-9	Vaca Dixon 230/115 kV Transformer No. 3	VACA-DIX E 230 kV Bus 2 and VACA-DIX F 230 kV Bus 2 - CB 62	C2	Stuck Bkr	<100	112	121	Operating solution
SAC-SP-T-10	Vaca Dixon 230/115 kV Transformer No. 4	VACA-DIX E 230 kV Bus 1 and Bus 2 - CB 202 Failure	C2	Stuck Bkr	<100	107	115	Operating solution
SAC-SP-T-11	Rio Oso - Brighton 230 kV Line	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	108	<100	<100	Interim operating solution
SAC-SP-T-12	Woodland - Davis 115 kV Line	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	124	<100	<100	Interim operating solution
SAC-SP-T-13	West Sacramento - Brighton 115 kV Line	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	113	<100	<100	Interim operating solution
SAC-SP-T-14	Brighton - Davis 115 kV Line	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	140	<100	<100	Interim operating solution
SAC-SP-T-15	Rio Oso - Woodland 115 kV No. 1	Brighton 230/115 kV Transformer No. 10 & Brighton 230/115 kV Transformer No. 9	C3	N-1-1	102	<100	<100	Interim operating solution
SAC-SP-T-16	Woodland - Davis 115 kV Line	Brighton 230/115 kV Transformer No. 10 & Brighton 230/115 kV Transformer No. 9	C3	N-1-1	179	<100	<100	Interim operating solution
SAC-SP-T-17	Rio Oso - Woodland 115 kV No. 2	Brighton 230/115 kV Transformer No. 10 & Brighton 230/115 kV Transformer No. 9	C3	N-1-1	107	<100	<100	Interim operating solution
SAC-SP-T-18	West Sacramento - Davis 115 kV Line	Woodland - Davis 115 kV Line & Brighton - Davis 115 kV Line	C3	N-1-1	112	<100	<100	Interim operating solution

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Study Area: **PG&E Central Valley Sacramento - 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	
SAC-SP-T-19	Brighton 230/115 kV Transformer No. 9	Woodland - Davis 115 kV Line & Brighton 230/115 kV Transformer No. 10	C3	N-1-1	108	<100	<100	Interim operating solution
SAC-SP-T-20	Brighton - Davis 115 kV Line	West Sacramento - Brighton 115 kV Line & Woodland - Davis 115 kV Line	C3	N-1-1	161	<100	<100	Interim operating solution
SAC-SP-T-21	Vaca Dixon 230/115 kV Transformer No. 2	Vaca Dixon 230/115 kV Transformer No. 3 & Vaca Dixon 230/115 kV Transformer No. 4	C3	N-1-1	<100	111	120	Operating solution
SAC-SP-T-22	Vaca Dixon 230/115 kV Transformer No. 3	Vaca Dixon 230/115 kV Transformer No. 2 & Vaca Dixon 230/115 kV Transformer No. 4	C3	N-1-1	<100	114	123	Operating solution
SAC-SP-T-23	Vaca Dixon 230/115 kV Transformer No. 4	Vaca Dixon 230/115 kV Transformer No. 2 & Vaca Dixon 230/115 kV Transformer No. 3	C3	N-1-1	<100	114	123	Operating solution
SAC-SP-T-24	Vaca - Suisun - Jameson 115 kV Line	Vaca-Vacaville-Jameson-North Tower 115 kV Line & Vaca - Suisun 115 kV Line	C3	N-1-1	117	125	136	Existing SPS
SAC-SP-T-25	Vaca Dixon 230/115 kV Transformer No. 2	Vaca Dixon 230/115 kV Transformer No. 3 & Vaca Dixon 230/115 kV Transformer No. 4	C3	N-1-1	138	<100	<100	Interim operating solution
SAC-SP-T-26	Vaca Dixon 230/115 kV Transformer No. 2A	Vaca Dixon 230/115 kV Transformer No. 3 & Vaca Dixon 230/115 kV Transformer No. 4	C3	N-1-1	165	<100	<100	Interim operating solution
SAC-SP-T-27	Woodland - Davis 115 kV Line	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	C5	DCTL	119	<100	<100	Existing SPS
SAC-SP-T-28	Woodland - Davis 115 kV Line	Rio Oso-Woodland #1 115 kV Line & Rio Oso-Woodland #2 115	C5	DCTL	104	<100	<100	Interim operating solution
SAC-SP-T-29	Brighton - Davis 115 kV Line	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	C5	DCTL	141	<100	<100	Existing SPS

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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	
SAC-SP-T-30	Brighton - Davis 115 kV Line	Rio Oso-Woodland #1 115 kV Line & Rio Oso-Woodland #2 115	C5	DCTL	111	<100	<100	Interim operating solution

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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Study Area: **PG&E Central Valley Sacramento - 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	
SAC-SP-VD-1	POST 115 kV	West Sacramento - Brighton 115 kV Line	B	L-1	7.6	<5.0	<5.0	Interim operating solution
SAC-SP-VD-2	DAVIS 115 kV	West Sacramento - Brighton 115 kV Line	B	L-1	5.2	<5.0	<5.0	Interim operating solution
SAC-SP-VD-3	CAMPUS 115 kV	West Sacramento - Brighton 115 kV Line	B	L-1	5.2	<5.0	<5.0	Interim operating solution
SAC-SP-VD-4	CORT_D 115 kV	Cortina 230/115 kV Transformer No. 4	B	T-1	<5.0	5.4	<5.0	Cortina 60 kV area voltage support
SAC-SP-VD-5	SUISUN 115 kV	Vaca - Suisun 115 kV Line	B	L-1	<5.0	<5.0	5.5	Existing SPS
SAC-SP-VD-6	WILKINS 60 kV	Cortina 60 kV Line No. 1	B	L-1	6.2	6.9	7.5	Cortina 60 kV area voltage support
SAC-SP-VD-7	DEEPWATR 115 kV	West Sacramento - Brighton 115 kV Line	B	L-1	7.8	<5.0	<5.0	Interim operating solution
SAC-SP-VD-8	SCHMLBCH 115 kV	Vaca - Suisun 115 kV Line	B	L-1	<5.0	<5.0	5.3	Existing SPS
SAC-SP-VD-9	W.SCRMNO 115 kV	West Sacramento - Brighton 115 kV Line	B	L-1	7.6	<10.0	<10.0	Interim operating solution
SAC-SP-VD-10	POST 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	22.9	<10.0	<10.0	Interim operating solution
SAC-SP-VD-11	WCRP 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	23.4	<10.0	<10.0	Interim operating solution
SAC-SP-VD-12	DAVIS 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	20.7	<10.0	<10.0	Interim operating solution
SAC-SP-VD-13	CAMPUS 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	20.7	<10.0	<10.0	Interim operating solution
SAC-SP-VD-14	WOODLD 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	15.4	<10.0	<10.0	Interim operating solution
SAC-SP-VD-15	ZAMORA 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	12.1	<10.0	<10.0	Interim operating solution

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	
SAC-SP-VD-16	BRKR SLG 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	21.9	<10.0	<10.0	Interim operating solution
SAC-SP-VD-17	DEEPWATR 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	23.5	<10.0	<10.0	Interim operating solution
SAC-SP-VD-18	KNIGHTLD 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	11.7	<10.0	<10.0	Interim operating solution
SAC-SP-VD-19	W.SCRMNO 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	23.2	<10.0	<10.0	Interim operating solution
SAC-SP-VD-20	WOODLD 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	10.0	<10.0	<10.0	Interim operating solution
SAC-SP-VD-21	ZAMORA 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	11.0	<10.0	<10.0	Interim operating solution
SAC-SP-VD-22	KNIGHTLD 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	11.0	<10.0	<10.0	Interim operating solution
SAC-SP-VD-23	POST 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	C5	DCTL	12.5	<10.0	<10.0	Interim operating solution
SAC-SP-VD-24	DEEPWATR 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	C5	DCTL	12.7	<10.0	<10.0	Interim operating solution
SAC-SP-VD-25	W.SCRMNO 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	C5	DCTL	12.5	<10.0	<10.0	Interim operating solution

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

High/Low Voltage



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SAC-SP-V-1	CORTINA 115 kV	Normal	A	N-0	1.06	1.06	1.05	Under review for possible exemption
SAC-SP-V-2	PLAINFLD 60 kV	Vaca Dixon 115/60 kV Transformer No. 9	B	T-1	0.88	>0.9	>0.9	Interim operating solution
SAC-SP-V-3	POST 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-4	WCRP 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-5	DAVIS 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-6	CAMPUS 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-7	WOODLD 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.83	>0.9	>0.9	Interim operating solution
SAC-SP-V-8	ZAMORA 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.86	>0.9	>0.9	Interim operating solution
SAC-SP-V-9	BRKR SLG 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-10	DEEPWATR 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-11	KNIGHTLD 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.87	>0.9	>0.9	Interim operating solution
SAC-SP-V-12	PLAINFLD 60 kV	BUS FAULT AT 30460 VACA-DIX 230.00 Sec 1F	C1	Bus	0.89	>0.9	>0.9	Interim operating solution
SAC-SP-V-13	W.SCRMNO 115 kV	BUS FAULT AT 31984 BRIGHTN 115.00	C1	Bus	0.78	>0.9	>0.9	Interim operating solution
SAC-SP-V-14	PLAINFLD 60 kV	VACA-DIX E 230 kV Bus 1 and Bus 2 - CB 202 Failure	C2	Stuck Bkr	0.87	>0.9	>0.9	Interim operating solution
SAC-SP-V-15	WOODLD 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	0.88	>0.9	>0.9	Interim operating solution
SAC-SP-V-16	ZAMORA 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	0.87	>0.9	>0.9	Interim operating solution

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					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
SAC-SP-V-17	KNIGHTLD 115 kV	C2-5_RIO OSO 115 kV Bus 1 and 2 - CB 102 Failure	C2	Stuck Bkr	0.88	>0.9	>0.9	Interim operating solution
SAC-SP-V-18	POST 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-19	WCRP 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-20	DAVIS 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-21	DRAKE 60 kV	Cortina 230/115/60 kV Transformer No. 1 & Cortina 230/115 kV Transformer No. 4	C3	N-1-1	>0.9	0.89	0.88	Cortina 60 kV area voltage support
SAC-SP-V-22	CAMPUS 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-23	COLUSA 60 kV	Cortina 230/115 kV Transformer No. 4 & Cortina 230/115/60 kV Transformer No. 1	C3	N-1-1	0.88	0.87	0.87	Cortina 60 kV area voltage support
SAC-SP-V-24	WOODLD 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.80	>0.9	>0.9	Interim operating solution
SAC-SP-V-25	ZAMORA 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.84	>0.9	>0.9	Interim operating solution
SAC-SP-V-26	MAXWELL 60 kV	Cortina 230/115 kV Transformer No. 4 & Cortina 230/115/60 kV Transformer No. 1	C3	N-1-1	0.90	0.89	0.88	Cortina 60 kV area voltage support
SAC-SP-V-27	ARBUCKLE 60 kV	Cortina 230/115/60 kV Transformer No. 1 & Cortina 230/115 kV Transformer No. 4	C3	N-1-1	>0.9	>0.9	0.89	Cortina 60 kV area voltage support
SAC-SP-V-28	BRKR SLG 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-29	DEEPWATR 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution

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SAC-SP-V-30	DUNNIGAN 60 kV	Cortina 230/115 kV Transformer No. 4 & Cortina 230/115/60 kV Transformer No. 1	C3	N-1-1	0.89	0.88	0.87	Cortina 60 kV area voltage support
SAC-SP-V-31	GRAND IS 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.73	>0.9	>0.9	Interim operating solution
SAC-SP-V-32	HARINTON 60 kV	Cortina 230/115/60 kV Transformer No. 1 & Cortina 230/115 kV Transformer No. 4	C3	N-1-1	>0.9	0.89	0.89	Cortina 60 kV area voltage support
SAC-SP-V-33	KNIGHTLD 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.85	>0.9	>0.9	Interim operating solution
SAC-SP-V-34	PLAINFLD 60 kV	Vaca Dixon 230/115 kV Transformer No. 3 & Vaca Dixon 230/115 kV Transformer No. 4	C3	N-1-1	0.86	>0.9	>0.9	Interim operating solution
SAC-SP-V-35	W.SCRMNO 115 kV	Rio Oso - Brighton 230 kV Line & Brighton - Bellota 230 kV Line	C3	N-1-1	0.75	>0.9	>0.9	Interim operating solution
SAC-SP-V-36	POST 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brig	C5	DCTL	0.89	>0.9	>0.9	Interim operating solution
SAC-SP-V-37	DAVIS 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brig	C5	DCTL	0.89	>0.9	>0.9	Interim operating solution
SAC-SP-V-38	CAMPUS 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brig	C5	DCTL	0.89	>0.9	>0.9	Interim operating solution
SAC-SP-V-39	DEEPWATR 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brig	C5	DCTL	0.88	>0.9	>0.9	Interim operating solution
SAC-SP-V-40	W.SCRMNO 115 kV	Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brig	C5	DCTL	0.89	>0.9	>0.9	Interim operating solution

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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.

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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	
SAC-SP-SS-1	Vacaville	102	107	116	Upgrade 115 kV lines to be able to normally close bus sectionalizing breaker