

Study Area: San Diego Area  
Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
22886 SUNCREST 230 228860 SUNCREST TP1 230 1 1	TL50001_Line ECO-ML 500kV ck 1	P1	N-1	<100	<100	<100	<100	<100	<100	115.47	101.94	Existing TL23040 IV 500 kV N-1 RAS would eliminate the P1 and the P3 overload concerns along with system adjustment after the G-1 event. The 30-minute short-term emergency ratings of the 230 kV lines (130% higher than their continuous ratings) allow the market and operators to bring down the overloads that do not exceed 130% for the P6 contingencies within the continuous ratings in 30 minutes as operational mitigation measures. The remaining P6 overloads that exceed 130% can be eliminated by additional system adjustment between the overlapping P1 events. Either the operational mitigations or the system adjustment could involve operational actions, such as reducing generation output in the greater IV area, dispatching convention gas generation, preferred resources, and/or energy storage in the San Diego area, and adjusting the IV phase shifting transformers as needed.  Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.
	TL50001_Line ECO-ML 500kV ck 1 AND PEC_ALL_Gen PEN_CT1/CT2/ST ID 1	P3	G-1/N-1	113.41	<100	103.99	<100	<100	<100	<100	117.78	
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND PEC_ALL_Gen PEN_CT1/CT2/ST ID 1	P3	G-1/N-1	102.1	<100	<100	<100	<100	<100	Nonconv	Nonconv	
	TL50001_Line ECO-ML 500kV ck 1 AND OMEC_ALL_Gen OTAYMGT1/GT2/ST1 ID 1	P3	G-1/N-1	112.55	<100	<100	<100	<100	<100	<100	<100	
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND OMEC_ALL_Gen OTAYMGT1/GT2/ST1 ID 1	P3	G-1/N-1	101.25	<100	<100	<100	<100	<100	Nonconv	Nonconv	
	ML7013_ML 7013 CB - BK 80&81	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	115.23	102.46	
	ECO-500-4T_CB EAST COUNTY 500KV 4T	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	111.7	<100	
	ML8013_ML 8013 CB - BK 80&TL50001	P4	Fault+Stuck Breaker	<100	104.55	<100	<100	<100	<100	115.57	102.3	
	ML8023_ML 8023 CB - BK 81&TL50001	P4	Fault+Stuck Breaker	<100	104.55	<100	<100	<100	<100	115.57	102.38	
	TL50001_Line ECO-ML 500kV ck 1 AND TL23050_Line IV PST-ROA 230kV ck 1	P6	N-1-1	115.46	<100	106.51	<100	<100	101.51	<100	119.33	
	TL23040_Line OM-TJI 230kV ck 1 AND TL50001_Line ECO-ML 500kV ck 1	P6	N-1-1	<100	<100	104.44	<100	<100	<100	<100	117.45	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL50001_Line ECO-ML 500kV ck 1	P3	G-1/N-1	104.92	<100	103.74	<100	<100	<100	<100	108.76	The 30-minute ratings allow the market and operators to eliminate the P6 overloads that do not exceed 130%, within 30 minutes as post-contingency operational mitigations, along with existing TL23054/23055 RAS. The remaining P6 overloads that exceed 130% can be addressed by additional system adjustment between the overlapping P1 events. The system
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND PEC_ALL_Gen PEN_CT1/CT2/ST ID 1	P3	G-1/N-1	101.89	<100	<100	<100	<100	<100	Nonconv	Nonconv	



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228320 SYCAMORE TP1 230 22832 SYCAMORE 230 1 1	TL50001_Line ECO-ML 500kV ck 1 AND TL23055_Line SCR-SX 230kV ck 2	P6	N-1-1	176.18	144.8	166.93	134.89	<100	152.31	227.29	191.3	adjustment between the overlapping P1 events. The system adjustments could involve operational actions, such as reducing generation in the greater IV area while dispatching conventional gas units, preferred resources, and energy storage in the San Diego and SCE areas, curtailing the ISO import, adjusting the IV phase shifting transformers, and bypassing the series capacitor banks in the 500 kV lines between Hassayampa and North Gila as needed.
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND TL23055_Line SCR-SX 230kV ck 2	P6	N-1-1	157.39	115.54	139.58	112.29	<100	123.37	Nonconv	Nonconv	Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.
22885 SUNCREST 500 22889 SNCRSMP2 500 1 1	SCR_BK80_Trans SCR 500/230kV ck 1	P1	N-1	<100	<100	<100	<100	<100	<100	102.13	<100	The 30-minute short-term emergency ratings of the Suncrest banks (125% of their long-term emergency ratings) should be utilized for the market and operators to eliminate the P6 overloads that do not exceed 125% in 30 minutes by performing post-contingency operational mitigation measures.
	TL50001_Line ECO-ML 500kV ck 1 AND SCR_BK80_Trans SCR 500/230kV ck 1	P6	N-1-1	132.27	109.16	126.28	103.26	<100	112.24	183.79	142.23	The remaining P6 overloads that exceed 125% can be eliminated by additional system adjustment between the overlapping P1 events. Either the operational mitigations or the system adjustment would be similar to the actions addressing the TL23054/23055 overload issues described above, but the scope of these operation actions tends to be relatively smaller.
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND SCR_BK80_Trans SCR 500/230kV ck 1	P6	N-1-1	119.36	<100	106.18	<100	<100	<100	Nonconv	Nonconv	Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.
22885 SUNCREST 500 22888 SNCRSMP1 500 1 1	SCR_BK81_Trans SCR 500/230kV ck 2	P1	N-1	<100	<100	<100	<100	<100	<100	102.13	<100	The 30-minute short-term emergency ratings of the Suncrest banks (125% of their long-term emergency ratings) should be utilized for the market and operators to eliminate the P6 overloads that do not exceed 125% in 30 minutes by performing post-contingency operational mitigation measures.
	TL50001_Line ECO-ML 500kV ck 1 AND SCR_BK81_Trans SCR 500/230kV ck 2	P6	N-1-1	132.2	109.08	126.24	103.11	<100	112.16	183.74	142.27	The remaining P6 overloads that exceed 125% can be eliminated by additional system adjustment between the overlapping P1 events. Either the operational mitigations or the system adjustment would be similar to the actions addressing the TL23054/23055 overload issues described above, but the scope of these operation actions tends to be relatively smaller.
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND SCR_BK81_Trans SCR 500/230kV ck 2	P6	N-1-1	119.3	<100	106.12	<100	<100	<100	Nonconv	Nonconv	Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.

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22609 OTAYMESA 230 22466 MLMS3TAP 230 1 1	TL23041_Line SX-OM-ML 230kV ck 1	P1	N-1	<100	104.55	<100	<100	<100	105.54	<100	<100	Congestion management. For the P6 contingencies, system adjustments after first contingency.
	TL23041B_TL23041B OTAYMESA-MLSXTAP ckt 1	P2.1	Line Section w/o Fault	<100	104.91	<100	<100	<100	105.89	<100	<100	
	SX-230-23T_CB SYCAMORE CANYON 230KV 22T	P4	Fault+Stuck Breaker	<100	104.58	<100	<100	<100	105.58	<100	<100	
	SX-23T_SYCAMORE 230 kV 23T CB	P4	Fault+Stuck Breaker	<100	104.58	<100	<100	<100	105.58	<100	<100	
	ML-4T_Miguel 230 kV 4T CB	P4	Fault+Stuck Breaker	<100	104.45	<100	<100	<100	105.45	<100	<100	
	TL23041_Line SX-OM-ML 230kV ck 1 AND TL50001_Line ECO-ML 500kV ck 1	P6	N-1-1	<100	122.37	<100	<100	<100	123.76	<100	<100	
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND TL23041_Line SX-OM-ML 230kV ck 1	P6	N-1-1	<100	104.87	<100	<100	<100	105.4	<100	<100	
22609 OTAYMESA 230 22467 MLSXTAP 230 1 1	TL23042_Line BB-OM-ML 230kV ck 1	P1	N-1	<100	104.49	<100	<100	<100	105.47	<100	<100	Congestion management. For the P6 & P7 contingencies, system adjustments after first contingency.
	TL23042B_TL23042B OTAYMESA-MLMS3TAP ck 1	P2.1	Line Section w/o Fault	<100	104.76	<100	<100	<100	105.74	<100	<100	
	BB-230-4T_CB BAY BOULEVARD 230KV 4T	P4	Fault+Stuck Breaker	<100	104.48	<100	<100	<100	105.47	<100	<100	
	ML-230-7T_CB MIGUEL 230KV 7T	P4	Fault+Stuck Breaker	<100	104.22	<100	<100	<100	105.21	<100	<100	
	TL23042_Line BB-OM-ML 230kV ck 1 AND TL50001_Line ECO-ML 500kV ck 1	P6	N-1-1	<100	121.76	<100	<100	<100	123.14	<100	<100	
	TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS AND TL23042_Line BB-OM-ML 230kV ck 1	P6	N-1-1	<100	<100	<100	<100	<100	104.64	<100	<100	
	TL23042+13815_TC-GHL + ML-SG-OM	P7	DCTL	<100	104.45	<100	<100	<100	105.35	<100	<100	
20102 RIIM-230 230 20118 ROL-230 230 1 1	ML8013_ML 8013 CB - BK 80&TL50001	P4	Fault+Stuck Breaker	<100	<100	<100	<100	106.46	<100	<100	<100	Use of existing 230kV Otay Mesa Gen Drop RAS, and pre-
	ML8023_ML 8023 CB - BK 81&TL50001	P4	Fault+Stuck Breaker	<100	<100	<100	<100	106.43	<100	<100	<100	

20102 RIIM-230 230 20118 ROL-230 230 1 1

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20102 TROMP 230 230 20110 TROMP 230 230 1 1	ML7013_ML 7013 CB - BK 80&81	P4	Fault+Stuck Breaker	<100	<100	<100	<100	106.42	<100	<100	<100	contingency congestion management.
	TL23041+23042_Lines SX-OM-ML 230kV ck 1 + BB-OM-ML 230kV ck 1	P7	DCTL	132.98	140.75	<100	109.22	<100	140.76	<100	<100	
22468 MIGUEL 500 22472 MIGUELMP 500 1 1 AND 22464 MIGUEL 230 22472 MIGUELMP 500 1 1	ML_BK81_Tran ML 500/230kV ck 2	P1	N-1	<100	<100	<100	<100	<100	<100	141.23	<100	Rely on congestion management and the existing Miguel BK 80/81 RAS, along with the use of the 24-hr emergency ratings of the Miguel banks (if necessary, the 30-min emergency rating may also be utilized). Additional system adjustments can be utilized after the first contingency for the P3 & P6 events. These system adjustments would be similar to the actions described above for the TL23054/23055 overload issues, but the scope of these operation actions tends to be relatively smaller.  Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.
	TL50003_Line OCO-SCR 500kV ck 1	P1	N-1	<100	<100	<100	<100	<100	<100	119.09	<100	
	OMEC_ALL_Gen OTAYMGT1/GT2/ST1 ID 1 AND ML_BK81_Tran ML 500/230kV ck 2	P3	G-1/N-1	101.32	<100	<100	<100	<100	<100	<100	<100	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND ML_BK81_Tran ML 500/230kV ck 2	P3	G-1/N-1	<100	<100	101.79	<100	<100	<100	<100	102.89	
	OCO-500-2W_CB OCOTILLO 500KV 2W	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	117.86	<100	
	ML-230-2T_CB MIGUEL 230KV 2T	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	140.89	<100	
	ML-2T_MIGUEL 230 kV 2T CB	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	140.89	<100	
	TL50003_Line OCO-SCR 500kV ck 1 AND ML_BK81_Tran ML 500/230kV ck 2	P6	N-1-1	140.67	106.66	137.8	108.44	<100	112.53	223.84	154.95	
	TL50003+GEN_DROP_RAS_Line OCO-SCR 500kV ck 1 + GEN DROP RAS AND ML_BK81_Tran ML 500/230kV ck 2	P6	N-1-1	119.76	<100	115.86	<100	<100	<100	Nonconv	Nonconv	
22464 MIGUEL 230 22468 MIGUEL 500 2 1	ML_BK80_Tran ML 500/230kV ck 1	P1	N-1	<100	<100	<100	<100	<100	<100	138.42	<100	Rely on congestion management and the existing Miguel BK 80/81 RAS, along with the use of the 24-hr emergency ratings of the Miguel banks (if necessary, the 30-min emergency rating may also be utilized). Additional system adjustments can be utilized after the first contingency for the P3 & P6 events. These system adjustments would be similar to the actions described above for the TL23054/23055 overload issues, but the scope of these operation actions tends to be relatively smaller.  Reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. The amount of gen drop as part of the RAS actions is being investigated.
	TL50003_Line OCO-SCR 500kV ck 1 AND ML_BK80_Tran ML 500/230kV ck 1	P6	N-1-1	134.49	104.89	135.51	105.64	<100	110.66	220.04	151.18	
	TL50003+GEN_DROP_RAS_Line OCO-SCR 500kV ck 1 + GEN DROP RAS AND ML_BK80_Tran ML 500/230kV ck 1	P6	N-1-1	117.75	<100	113.98	<100	<100	<100	Nonconv	Nonconv	
22930 ECO 500 22468 MIGUEL 500 1 2	OCO-500-1E_CB OCOTILLO 500KV 1E	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	116.97	<100	Existing TL23040 IV 500 kV N-1 RAS would eliminate the P4 and P7 overload concerns along with system adjustment after the G-1 event as needed. The P6 overload can be eliminated by the svstem adjustment between the overlaapping P1 events.
	SCR-2T_SUNCREST 2T BK81 & TL50003	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	118.03	<100	
	SCR-500-2T_CB SUNCREST 500KV 2T	P4	Fault+Stuck Breaker	<100	<100	<100	<100	<100	<100	118.03	<100	

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	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50003_Line OCO-SCR 500kV ck 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	136.1	<100	
	TL23054+23055_Lines SCR-SX 230kV ck 1 + SCR-SX 230kV ck 2	P7	DCTL	<100	<100	<100	<100	<100	<100	117.38	<100	
22356 IMPRLVLY 230 22362 IV BK82 MP 500 1 1	IV_BK81_Tran IV 500/230kV ck 2 AND IV_BK80_Tran IV 500/230kV ck 1	P6	N-1-1	<100	<100	<100	<100	<100	<100	128.19	107.62	Curtail the generation that are delivered to the Imperial Valley 230 kV substation after the first contingency as system adjustment
22357 IV PFC1 230 22358 IV PFC 230 1 1	TL23040_Line OM-TJI 230kV ck 1 AND IV_PST2_Tran IV 230/230kV ck 2	P6	N-1-1	110.66	<100	<100	<100	<100	<100	110.59	<100	Curtail the path 45 flow southbound flow from SDGE to CENACE after the first contingency as system adjustment.
22357 IV PFC1 230 22358 IV PFC 230 1 1 AND 22357 IV PFC1 230 22358 IV PFC 230 2 1	TL50003_Line OCO-SCR 500kV ck 1 AND TL50001_Line ECO-ML 500kV ck 1	P6	N-1-1	106.44	<100	108.98	<100	<100	<100	Nonconv	<100	P6 overloads can be eliminated by system adjustments, such as reducing generation output in the greater IV area while dispatching conventional gas unit, preferred resources, and energy storage in the San Diego area, and adjusting the IV phase shifting transformers if needed.
22609 OTAYMESA 230 20149 TJI-230 230 1 2	TL23041_Line SX-OM-ML 230kV ck 1 AND TL23042_Line BB-OM-ML 230kV ck 1	P6	N-1-1	108.09	122.2	<100	<100	<100	122.22	<100	<100	Use of existing 230kV Otay Mesa Gen Drop RAS. The P6 overloads can be eliminated by the system adjustments, such as reducing generation output in the greater IV area while dispatching conventional gas unit, preferred resources, and energy storage in the San Diego area, and adjusting the IV phase shifting transformers if needed.
	TL50003_Line OCO-SCR 500kV ck 1 AND TL50001_Line ECO-ML 500kV ck 1	P6	N-1-1	<100	<100	114.8	<100	<100	<100	Nonconv	104.18	
22430 SILVERGT 230 22596 OLD TOWN 230 1 1	TL23028_Line SG-MS-OT 230kV ck 1 AND TL23071_Line SX-PQ 230kV ck 1	P6	N-1-1	<100	109.82	<100	102.37	<100	110.24	<100	103.7	The 2-hour short-term emergency ratings of TL23036, TL23028A, and TL23029 (129~143% higher than their normal ratings) would give the market and operators enough time to eliminate most of the P6 overloads as post-contingency operational mitigation measures.overloads over 143% of the normal ratings for the heavy northbound flow from SDGE to LA Basin via the north of SONGS 230 kV path could be eliminated by reducing generation, charging energy storage in the Otay Mesa area, and/or curtailing import from CENACE after the first contingency while dispatching the generation resources in the northern San Diego area and/or the SCE LA Basin
	TL23028_Line SG-MS-OT 230kV ck 1 AND TL50003_Line OCO-SCR 500kV ck 1	P6	N-1-1	<100	107.8	<100	100.51	<100	108.92	<100	106.28	
22430 SILVERGT 230 22597 OLDTWNT 230 1 1	TL23029_Line SG-OT 230kV ck 1 AND TL23071_Line SX-PQ 230kV ck 1	P6	N-1-1	<100	108.93	<100	101.56	<100	109.25	<100	102.76	
	TL23029_Line SG-OT 230kV ck 1 AND TL50003_Line OCO-SCR 500kV ck 1	P6	N-1-1	<100	107.72	<100	100.46	<100	108.74	<100	106.1	

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22356 IMPRLVLY 230 21025 ELCENTSW 230 1 1	TL50002_Line NG-IV 500kV ck 1 AND TL50003+GEN_DROP_RAS_Line OCO-SCR 500kV ck 1 + GEN DROP RAS	P6	N-1-1	<100	<100	<100	107.49	<100	<100	Nonconv	Nonconv	Congestion management to protect against the loss of TL50002. The amount of gen drop as part of the RAS actions is being investigated given that reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases
22870 VALCNTR 69.0 22012 ASH TP 69.0 1 1	TL50001_Line ECO-ML 500kV ck 1 AND BR_GEN1_Gen BR GEN1 ID 1	P3	G-1/N-1	<100	<100	<100	107.49	<100	<100	<100	107.93	System adjustments after first contingency
21072 YUCCA161 161 21059 PILOTKNB 161 1 1	TL50002_Line NG-IV 500kV ck 1	P1	N-1	101.69	99.89	<100	<100	<100	104.87	<100	<100	Congestion management
	PPEC_1A_Gen PIO PICO 1A ID 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	103.92	102.14	<100	<100	<100	107.08	<100	<100	System adjustments after first contingency
	OCO_GEN1_Gen OCO GEN ID G1/G2 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	103.9	102.12	<100	<100	<100	107.07	<100	<100	
	IV-500-8022_CB IMPERIAL VALLEY 500KV 8022	P4	Fault+Stuck Breaker	100.86	99.15	<100	<100	<100	104.11	<100	<100	Congestion management
	IV-8022_IV 8022 50002 & BK81 CB	P4	Fault+Stuck Breaker	100.68	99.15	<100	<100	<100	104.11	<100	<100	
	TL50002_Line NG-IV 500kV ck 1 AND TL50001+GEN_DROP_RAS_Line ECO-ML 500kV ck 1 + GEN DROP RAS	P6	N-1-1	120.58	133.99	100.14	<100	<100	139.19	Nonconv	Nonconv	Congestion management to protect against the loss of TL50002. The amount of gen drop as part of the RAS actions is being investigated given that reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. Generation dropped by the RAS may contribute to exacerbating overloads on the IID system.
21331 ELCENTSW 161 21059 PILOTKNB 161 1 1	IV_GEN1_ALL_Gen IV GEN1 ID 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	124.45	103.98	100.34	<100	<100	110.98	<100	<100	System adjustments after first contingency
	OMEC_ALL_Gen OTAYMGT1/GT2/ST1 ID 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	118.58	<100	<100	<100	<100	103.13	<100	<100	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	116.57	<100	<100	<100	<100	100.11	<100	<100	
	PLV-COL_Line PLV-COL 500kV ck 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	111.58	<100	<100	<100	<100	<100	<100	<100	



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Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
	EA_GEN1_10_Gen CEC GEN10 ID 1 AND TL50002_Line NG-IV 500kV ck 1	P3	G-1/N-1	102.15	<100	<100	<100	<100	<100	<100	<100	Congestion management to protect against the loss of TL50002. The amount of gen drop as part of the RAS actions is being investigated given that reducing the gen drop to 1150 MW, per existing RAS guidelines, addresses the Nonconv problems in the sensitivity cases. Generation dropped by the RAS may contribute to exacerbating overloads on the IID system
	TL50002_Line NG-IV 500kV ck 1 AND TL50003+GEN_DROP_RAS_Line OCO-SCR 500kV ck 1 + GEN DROP RAS	P6	N-1-1	144.53	125.06	122.3	<100	<100	131.67	Nonconv	Nonconv	
22604 OTAY 69.0 22616 OTAYLKTP 69.0 1 1	TL6910_Line BD-SLT 69kV ck 1	P1	N-1	122.01	111.73	<100	<100	<100	107.61	<100	<100	Pre-contingency Generation Re-dispatch/ Post-contingency Generation Redispatch within 30 minutes, 30-min rating
	TL0649D_TL0649D OTAYLKTP-SANYSDRO ck 1	P2.1	Line Section w/o Fault	113.55	105.65	<100	<100	<100	104.46	<100	<100	
22740 SANYSDRO 69.0 22616 OTAYLKTP 69.0 1 1	TL6910_Line BD-SLT 69kV ck 1	P1	N-1	102.38	101.78	<100	<100	<100	103.45	<100	<100	Pre-contingency Generation Re-dispatch/ Post-contingency Generation Redispatch within 30 minutes, 30-min rating
22708 SANLUSRY 69.0 22582 OCEAN RANCH 69.0 1 1	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL693_Line ME-SA 69kV ck 1	P3	G-1/N-1	<100	<100	104.35	<100	<100	<100	<100	<100	System adjustments after first contingency
22884 WARNERS 69.0 22688 RINCON 69.0 1 1	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	141.03	System adjustments after first contingency
22870 VALCNTR 69.0 22012 ASH TP 69.0 1 1	BR_GEN1_Gen BR GEN1 ID 1 AND TL688_Line ES-LI 69kV ck 1	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	129.99	System adjustments after first contingency
22884 WARNERS 69.0 22736 SANTYSBL 69.0 1 1	BR_GEN1_Gen BR GEN1 ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	<100	<100	<100	<100	<100	<100	<100	114.84	System adjustments after first contingency
System	TL50001+IV_N-1_RAS_Line ECO-ML 500kV ck 1 + IV N-1 RAS	P1	N-1	No issues	No issues	No issues	No issues	No issues	No issues	Nonconv	Nonconv	No non-convergence issues observed if the existing 1150 MW N-1 gen drop RAS guideline is followed
System	TL50003+GEN_DROP_RAS_Line OCO-SCR 500kV ck 1 + GEN DROP RAS	P1	N-1	No issues	No issues	No issues	No issues	No issues	No issues	Nonconv	Nonconv	No non-convergence issues observed if the existing 1150 MW N-1 gen drop RAS guideline is followed
System	TL50005+GEN_DROP_RAS_Line IV-OCO 500kV ck 1 + GEN DROP RAS	P1	N-1	No issues	No issues	No issues	No issues	No issues	No issues	Nonconv	No issues	No non-convergence issues observed if the existing 1150 MW N-1 gen drop RAS guideline is followed

Study Area: San Diego Area

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
VALCNTR 69 kV	TL681_Line AS-VC-FE 69kV ck 1	P1	N-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	Pre-contingency energy storage curtailment. Propose a RAS to trip the energy storage (under charging mode) at Valley Center.
	TL0681B_TL0681B ASH TP-VALCNTR ck 1	P2.1	Line Section w/o Fault	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	
Q1191_HV 69 kV	TL681_Line AS-VC-FE 69kV ck 1	P1	N-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	
	TL0681B_TL0681B ASH TP-VALCNTR ck 1	P2.1	Line Section w/o Fault	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	
RINCON 69 kV	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.90	
SUNCREST TP1 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	>0.9	System adjustments, such as increasing dispatch of existing gas generation (Pio Pico, Carlsbad, Palomar Energy, Otay Mesa, etc.), after first contingency.
SUNCREST TP2 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	>0.9	
SYCAMORE TP1 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	>0.9	
SYCAMORE TP2 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	>0.9	
SNCRS SVC HV 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	>0.9	



Study Area: San Diego Area

Voltage Deviation



Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)					Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
VALCNTR 69 kV	TL681_Line AS-VC-FE 69kV ck 1	P1	N-1	<8	<8	<8	<8	<8	<8	<8	11.03	Pre-contingency energy storage curtailment. Propose a RAS to trip the energy storage (under charging mode) at Valley Center.
	TL0681B_TL0681B ASH TP-VALCNTR ck 1	P2.1	Line Section w/o Fault	<8	<8	<8	<8	<8	<8	<8	11.03	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	<8	<8	<8	<8	<8	<8	<8	10.91	
Q1191_HV 69 kV	TL681_Line AS-VC-FE 69kV ck 1	P1	N-1	<8	<8	<8	<8	<8	<8	<8	11.01	
	TL0681B_TL0681B ASH TP-VALCNTR ck 1	P2.1	Line Section w/o Fault	<8	<8	<8	<8	<8	<8	<8	11.01	
	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	<8	<8	<8	<8	<8	<8	<8	10.89	
RINCON 69 kV	PEC_ALL_Gen PEN_CT1/CT2/ST ID 1 AND TL681_Line AS-VC-FE 69kV ck 1	P3	G-1/N-1	<8	<8	<8	<8	<8	<8	<8	8.57	
SUNCREST TP1 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	<8	<8	<8	<8	<8	<8	14.88	<8	System adjustments, such as increasing dispatch of existing gas generation (Pio Pico, Carlsbad, Palomar Energy, Otay Mesa, etc.), after first contingency.
SUNCREST TP2 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	<8	<8	<8	<8	<8	<8	14.88	<8	
SYCAMORE TP1 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	<8	<8	<8	<8	<8	<8	14.65	<8	
SYCAMORE TP2 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	<8	<8	<8	<8	<8	<8	14.65	<8	
SNCRS SVC HV 230 kV	TL23050_Line IV PST-ROA 230kV ck 1 AND TL50004_Line IV-ECO 500kV ck 1	P6	N-1-1	<8	<8	<8	<8	<8	<8	15.01	<8	

Study Area: San Diego Area

Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2023 Spring Off-Peak	2026 Summer Peak	2031 Summer Peak	2026 SP High CEC Forecast	2023 OP Heavy Renewable & Min Gas Gen	
SLO Fault at DEVERS 500, trip DEVERS to VALLEYSC 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO Fault at PQ 230kV, trip PQ to SX 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO Fault at PEN 230, trip PEN to ES 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at IV 500kV, trip IMPRLVLY to ECO 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO at MIGUEL 500kV, trip MIGUEL to ECO 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO Fault at IV 230kV, trip IMPRLVLY PFC to ROA 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at IV 500kV, trip IMPRLVLY to N.GILA 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at PQ 230kV, trip PQ to OLD TOWN 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at SANLUSRY 230kV, trip SA to EA 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO Fault at TA 230kV, trip TA-ESC-CP 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at TALEGA 230kV, trip S.ONOFRE to TALEGA 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO Fault at PALO VERDE 500kV, trip PALO VERDE to COLRIVER 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at MIGUEL 230, trip MIGUEL to BAY BLVD to OTAY MESA 230kV	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO 3PH Fault at HAA 500kV, trip HAA - HDWSH 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO 3PH Fault at NG 500kV, trip NG - HAA 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
SLO 3PH Fault at HDWSH 500kV, trip HDWSH-NG 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at SILVERGT 230kV, trip SILVERGT to BAY BLVD 230kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at OLD TOWN 230kV, trip OT-MS-SG 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at IV 500kV, trip IMPRLVLY to OCOTILLO 500kV ck 1	P1	N-1	No issues	No issues	No issues	No issues	No issues	No violation
3PH Fault at ML230, trip ML230 bus	P2.2	Bus	No issues	No issues	No issues	No issues	No issues	No violation
Bus BATIQUITOS 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS BUE 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS CANNON 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
Bus CAPISTRANO 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS EAST COUNTY 138kv E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS FRIARS 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS GRANT HILL 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
Bus MISSION 230kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
Bus MISSION 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS PALOMAR AIRPORT 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS PALOMAR ENERGY 230kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS PICO 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS PROCTAR VALLEY 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS RANCHO MISSION VIEJO 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS SAN LUIS REY 230KV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation

Study Area: San Diego Area

Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2023 Spring Off-Peak	2026 Summer Peak	2031 Summer Peak	2026 SP High CEC Forecast	2023 OP Heavy Renewable & Min Gas Gen	
BUS SANTEE 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS SHADOW RIDGE 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS SILVERGATE 230kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS SYCAMORE CANYON 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS TALEGA 138kV E+W	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
BUS TELEGRAPH CANYON 138kV N+S	P5.5	Non-Redundant Relay	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at MIGUEL 230, trip both lines MIGUEL to MISSION 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at MIGUEL 230, trip MIGUEL to SYCAMORE and MIGUEL to SYCAMORE to OTAYMESA 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at SANLUSRY 230, trip TL23002 AND TL23006 SANLUSRY to S.ONOFRE 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at SANLUSRY 230kV, trip SA-EA AND SA-EATAP 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at S.ONOFRE 230, trip SO-SANTIAGO 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
DLO Fault at PEN230, trip PEN-AR 230kV AND PEN-ENCINATP 230kV	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
Fault at OTAYMESA 230kV, trip TL23041 AND TL23042	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation
3Ph Fault at SANLUSRY 230kV, trip SANLUSRY to MISSION 230kV 1 & 2	P7	DCTL	No issues	No issues	No issues	No issues	No issues	No violation

Study Area: San Diego Area



Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)								Potential Mitigation Solutions
			2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

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

Study Area: San Diego Area



Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)								Potential Mitigation Solutions
	2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	

No single source substation with more than 100 MW