2024-2025 ISO Reliability Assessment - Study Results
Study Area: SCE Main System including East of Lugo
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)**										Loading % (Sensitivity Scenarios)**				Project & Potential Mitigation Solutions
				B1: 2026 Summer Peak	B2: 2029 Summer Peak	B3: 2034 Summer Peak	B4: 2039 Summer Peak	B5: 2029 Summer-Off Peak	B6: 2034 Winter Peak	B7: 2026 Spring Off-Peak	B8: 2029 Spring Off-Peak	B9: 2034 Spring Off-Peak	B10: 2039 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S2: 2026 SP Heavy Renewable & Min Gas Gen	S3: 2026 OP BESS Charging Sensitivity	S4: 2039 SP LA Basin Hi-gas retirement	
24114 PARDEE 230 24128 S.CLARA 230 1 1	line_M_P7_0059_Line S.CLARA 230.0 to MOORPARK 230.0 Circuit 1 Line S.CLARA 230.0 to MOORPARK 230.0 Circuit 2	P7	common structure			102.3	124.6										116.9	Dispatch available resources including energy storage and demand response in the Ventura area after the 1st event of P6 contingency or pre-contingency for the P7 contingencies; The use of energy storage is subject to verification that it has sufficient MWh capability and can be fully charged when needed. If the energy storage resources in the Ventura area are insuffcient or limited to be charged, the needs for upgrading the 230 kV lines will be considered as alternatives.
24114 PARDEE 230 24155 VINCENT 230 2 1	line_V_P7_0054_Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 1 Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 2	P7	common structure				102.4										117.3	
24114 PARDEE 230 26098 SYLMAR220 230 1 1	line_MVP_P1_110_Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 2 -AND- line_MVP_P1_82_Line LUGO 500.0 to VICTORVL 500.0 Circuit 1	P6*	overlapping singles				118.0										127.4	
24128 S.CLARA 230 24099 MOORPARK 230 2 1	line_MVP_P1_115_Line S.CLARA 230.0 to MOORPARK 230.0 Circuit 1 -AND- line_MVP_P1_101_Line PARDEE 230.0 to S.CLARA 230.0 Circuit 1	P6*	overlapping singles				117.8										110.8	
29516 VINCNT2 230 24128 S.CLARA 230 1 1	line_V_P7_0054_Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 1 Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 2	P7	common structure														103.9	
24393 MESACALS 230 24076 LAGUBELL 230 2 1	line_M_P7_0013_Line REDONDO 230.0 to MESA CAL 230.0 Circuit 1 Line LAGUBELL 230.0 to MESACAL 230.0 Circuit 1	P7	common structure	101.1											101.2			The P6 and all P7 overloads could be eliminated by dispatching available resources including energy storage and demand response in the West LA Basin after the 1st event of P6 contingency and pre-contingency for the P7 contingencies; In the near term, the use of energy storage is subject to verification that it has sufficient MWh capability and can be fully charged when needed in the West LA basin. In the long-term, previously approved transmission projects mitigate these concerns.
24393 MESACALS 230 24076 LAGUBELL 230 2 1	line_MVP_P1_30_Line CENTER 230.0 to MESACALS 230.0 Circuit 1 -AND- line_MVP_P1_71_Line LAGUBELL 230.0 to MESA CAL 230.0 Circuit 1	P6*	overlapping singles	106.7											106.7			
24393 MESACALS 230 24076 LAGUBELL 230 2 1	line_MVP_P1_76_Line LITEHIPE 230.0 to MESA CAL 230.0 Circuit 1 -AND- line_MVP_P1_71_Line LAGUBELL 230.0 to MESA CAL 230.0 Circuit 1	P6*	overlapping singles	106.1											106.3			
24082 LCIENEGA 230 24074 LA FRESA 230 1 1	line_M_P7_0041_Line LA FRESA 230.0 to EL NIDO 230.0 Circuit 3 Line LA FRESA 230.0 to EL NIDO 230.0 Circuit 4	P7	common structure	128.2											128.6			
24084 LITEHIPE 230 24091 MESA CAL 230 1 1	line_M_P7_0013_Line REDONDO 230.0 to MESA CAL 230.0 Circuit 1 Line LAGUBELL 230.0 to MESACAL 230.0 Circuit 1	P7	common structure	101.7											102.0			
24021 CENTER 230 24393 MESACALS 230 1 1	line_MVP_P1_71_Line LAGUBELL 230.0 to MESA CAL 230.0 Circuit 1 -AND- line_MVP_P1_150_line MESACALS 230.0 to LAGUBELL 230.0 Circuit 2	P6*	overlapping singles	106.5											106.6			
24030 BARRE-W 230 24044 ELLIS 230 #1 and #2	line_MVP_P1_246_Line BARRE-W 230.0 to ELLIS 230.0 Circuit 2 -AND- line_MVP_P1_27_Line BARRE 230.0 to LEWIS 230.0 Circuit 1	P6*	overlapping singles		103.1			104.0						100.7				
24701 KRAMER 230 24601 VICTOR 230 1 1	line_MVP_P1_169_Line IVANPAH 230.0 to ELDORDO2 230.0 Circuit 1 -AND- line_MVP_P1_186_Line PRIMM 230.0 to ELDORDO2 230.0 Circuit 1	P6*	overlapping singles	NConv	NConv	NConv		NConv			NConv	NConv	NConv	NConv	NConv	NConv	NConv	Rely on the Eldorado-Ivanpah RAS to address the P6 of the loss of Eldorado-Ivanpah and Eldorado2-Primm 230 kV lines. Also, loss of Eldorado 5AA bank is addressed by the RAS.
24701 KRAMER 230 24601 VICTOR 230 1 1	line_MVP_P1_168_Line ELDORDO2 230.0 to SLOAN CANYON 230.0 Circuit 1 -AND- tran_MVP_P1_305_Tran ELDORDO 500.00 to ELDORDO2 230.00 Circuit 5ELDOR 5T 13.80	P6*	overlapping singles	NConv	NConv	NConv		NConv			NConv	NConv	NConv	NConv	NConv	NConv	NConv	
25500 CALCITE 230 24085 LUGO 230 1 1	line_MVP_P1_138_Line PISGAH 230.0 to LUGO 230.0 Circuit 2	P1	Single Contingency				108.0										103.1	Rely on the future Calcite cRAS to drop generation in the Pisgah area for the P1 and P5 contingencies, and the P6 overloads could also eliminated by operational procedure caitailing generation after the 1st event of P6 contingency
25500 CALCITE 230 24085 LUGO 230 1 1	line_P5_TL_652_08_P5.2.13b Lugo-Pisgah No.2 230kV	P5	non-redundant component				108.0										103.1	
25500 CALCITE 230 24085 LUGO 230 1 1	line_MVP_P1_138_Line PISGAH 230.0 to LUGO 230.0 Circuit 2 -AND- line_MVP_P1_82_Line LUGO 500.0 to VICTORVL 500.0 Circuit 1	P6*	overlapping singles				125.4										125.8	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P1	Single Contingency				111.1										106.2	The P1 overload could be mitigated by operational mitigation actions, such as curtailing import from out of state resources and generation in the East of Pisgah area. The P6 overloads could be eliminated by operational mitigation actions, such as curtailing the import and the generation, and dispatching available resources including energy storage and demand response in the LA Basin as system adjustment after the first contingency. Stay informed on the future transmission projects to interconnect the out-of-state wind resources and modify the Lugo-Victorville RAS as needed
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	line_MVP_P1_219_Line LUGO 500.0 to MOHAVE 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles			121.3	155.4										153.9	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	line_MVP_P1_90_Line MOHAVE 500.0 to ELDORDO 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles			108.1	142.5										147.0	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	P1L_NV-AZ058_Line MEAD 500.0 to MARKETPL 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles				122.2										123.8	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	P1L_NV-AZ049_Line H ALLEN 500.0 to MEAD 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles				126.7										119.5	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	P1L_NV-AZ060_Line NAVAJO 500.0 to CRYSTAL 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles				119.7										116.2	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	P1DC_PDCI2_PDCI CONVERTER MONOPOLE #2 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles				115.8										111.3	
24042 ELDORDO 500 26048 MCCULLGH 500 1 1	G1_603_Gen Alamitos Repower -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P3*	G-1/N-1				112.4										107.5	
24086 LUGO 500 26105 VICTORVL 500 1 1	line_MVP_P1_219_Line LUGO 500.0 to MOHAVE 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles				103.0										126.0	
24086 LUGO 500 26105 VICTORVL 500 1 1	line_MVP_P1_90_Line MOHAVE 500.0 to ELDORDO 500.0 Circuit 1 -AND- line_MVP_P1_49_Line ELDORDO 500.0 to LUGO 500.0 Circuit 1	P6*	overlapping singles														121.4	
24138 SERRANO 500 24137 SERRANO 230 3 1	tran_MVP_P1_312_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 1SERRAN1T 13.80 -AND- tran_MVP_P1_313_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 2SERRAN2T 13.80	P6*	overlapping singles	125.8											124.5			Previously approved 4th Serrano bank project mitigates the P6 overloads. Rely on operational mitigation OP7590 as interim mitigation.
24138 SERRANO 500 24184 serran1i 13.8 1 1	tran_MVP_P1_314_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 3 0.00 -AND- tran_MVP_P1_313_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 2SERRAN2T 13.80	P6*	overlapping singles	127.2											125.9			
24138 SERRANO 500 24186 serran2i 13.8 2 1	tran_MVP_P1_312_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 1SERRAN1T 13.80 -AND- tran_MVP_P1_314_Tran SERRANO 500.00 to SERRANO 230.00 Circuit 3 0.00	P6*	overlapping singles	129.6											128.2			
24156 VINCENT 500 24190 vincen2i 13.8 AA Bank #2	line_T_P4_001_Vincent - Lugo No. 1 500 kV line and Vincent 3AA transformer bank	P4	stuck breaker												105.6			Investgate potential mitigations addressing the P4 overloads, such as re-energizing the 230 kV bus tie breaker, re-arrange the Vincent - Lugo 500 kV lines and the Vicent 3AA banks, and/or develop short term emergency rating of Vincent 2AA bank. The P6 overloads could be eliminated by operational mitigation actions, such as curtaining generation in the Northern area, reducing import via Path 26, and along with dispatching available resources including energy storage and demand response in the Western LA Basin, after the first contingency as system adjustment.
24156 VINCENT 500 24155 VINCENT 230 3 1	tran_MVP_P1_320_Tran VINCENT 500.00 to VINCENT 230.00 Circuit 2VINCEN2T 13.80 -AND- line_MVP_P1_136_Line VINCENT 500.0 to MESA CAL 500.0 Circuit 1	P6*	overlapping singles	113.9											131.1			
24156 VINCENT 500 24190 vincen2i 13.8 2 1	tran_MVP_P1_321_Tran VINCENT 500.00 to VINCENT 230.00 Circuit 3 0.00 -AND- line_MVP_P1_136_Line VINCENT 500.0 to MESA CAL 500.0 Circuit 1	P6*	overlapping singles	110.4											127.3			
24386 MESA CAL 500 24390 mesa4I 13.8 4 1	tran_MVP_P1_328_Tran MESA CAL 500.00 to MESA CAL 230.00 Circuit 2MESA2T 13.80 -AND- tran_MVP_P1_329_Tran MESA CAL 500.00 to MESACALS 230.00 Circuit 3MESA3T 13.80	P6*	overlapping singles	110.2											112.1			The P6 overloads could be eliminated by operational mitigation actions, such as dispatching available resources including energy storage and demand response in the Western LA Basin after the first contingency as system adjustment.
24590 MW_VINCNT_12 500 24156 VINCENT 500 1 1	line_MVP_P1_254_Line MIDWAY 500.0 to WIRLWIND 500.0 Circuit 3 -AND- line_MVP_P1_252_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 2	P6*	overlapping singles	119.1	118.1									118.0	119.9			The P6 overloads with heavy Path 26 flow scenarios from north to south upto the 4000 MW of limit and from south to north up to the 3000 MW limit could be eliminated by operational mitigation actions, by reducung power flow import or export via Path 26 after the 1st contingency of the
24592 MW_VINCNT_22 500 24156 VINCENT 500 2 1	line_MVP_P1_254_Line MIDWAY 500.0 to WIRLWIND 500.0 Circuit 3 -AND- line_MVP_P1_250_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 1	P6*	overlapping singles	119.2	118.3									118.3	120.1			
30060 MIDWAY 500 24591 MW_VINCNT_11 500 1 1	line_MVP_P1_254_Line MIDWAY 500.0 to WIRLWIND 500.0 Circuit 3 -AND- line_MVP_P1_252_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 2	P6*	overlapping singles	119.8	119.1									119.1	120.6			

30060 MIDWAY 500 24593 MW_VINCNT_21 500 2 1	line_MVP_P1_254_Line MIDWAY 500.0 to WIRLWIND 500.0 Circuit 3 -AND- line_MVP_P1_250_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 1	P6*	overlapping singles	120.0	119.3									119.3	120.8			[illegible] P6 contingency.
30060 MIDWAY 500 24593 MW_VINCNT_21 500 2 1	P1DC_PDCI2_PDCI CONVERTER MONOPOLE #2 -AND- line_MVP_P1_250_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 1	P6*	overlapping singles	112.8	106.1									106.1	115.2			
24594 MW_WRLWND_32 500 29402 WIRLWIND 500 3 1	line_MVP_P1_252_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 2 -AND- line_MVP_P1_250_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 1	N-2	Always Credible Common Corridor	166.4	165.1	116.2			130.6			130.7		165.1	167.1			The N-2 overloads for the operating scenarios with heavy Path 26 flow from north to south (B1/B2/B3/B6/S1/S2) could be eliminated by the PG&E Path 26 RAS curtailing generation and the SCE Path 26 RAS dropping loads. The N-2 overloads for the operating scenario with heavy Path 26 flow from south to north (B9) requires further investigation.
30060 MIDWAY 500 24595 MW_WRLWND_31 500 3 1	line_MVP_P1_250_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 1 -AND- line_MVP_P1_252_Line MIDWAY 500.0 to VINCENT 500.0 Circuit 2	N-2	Always Credible Common Corridor	113.6	112.8	113.8								112.9	114.0			
22430 SILVERGT 230 22771 BAY BLVD 230 1 1	P1L_SDGE40_Line IMPRLVLY 500KV to NSONGS 500 Circuit 1	P1	Single Contingency														112.9	Dispatch available resources including energy storage and demand response in the SDG&E area and LA Basin for the pre-contingency of P1 contingency and after the 1st event of P6 contingency as system adjustment. The use of energy storage is subject to verification that it has sufficient MWh capability and can be fully charged when needed.
22430 SILVERGT 230 22771 BAY BLVD 230 1 1	P1L_SDGE40_Line IMPRLVLY 500KV to NSONGS 500 Circuit 1 -AND- P1L-SDGE50RAS0_23310 LOST VALLEY-22885 SUNCREST 500KV &1	P6*	overlapping singles			104.2											127.0	
22430 SILVERGT 230 22771 BAY BLVD 230 1 1	line_MVP_P1_185_Line ALBERHIL 500.0 to VALLEYSC 500.0 Circuit 1 -AND- P1L_SDGE40_Line IMPRLVLY 500KV to NSONGS 500 Circuit 1	P6*	overlapping singles			101.1											120.3	
22930 ECO 500 22468 MIGUEL 500 1 2	P1L-SDGE50RAS0_23310 LOST VALLEY-22885 SUNCREST 500KV &1 -AND- P1L_SDGE40_Line IMPRLVLY 500KV to NSONGS 500 Circuit 1	P6*	overlapping singles														110.3	

Note (*): P6 and P3 results are reported without System adjustment between the two single P1 events

(**): Loading level in blank cell is less than 100% of applicable rating

2024-2025 ISO Reliability Assessment - Study Results

Study Area: **SCE Main System including East of Lugo**

Voltage Deviation

Substation	Contingency	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)										Post Cont. Voltage Deviation % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				B1: 2026 Summer Peak	B2: 2029 Summer Peak	B3: 2034 Summer Peak	B4: 2039 Summer Peak	B5: 2029 Summer-Off Peak	B6: 2034 Winter Peak	B7: 2026 Spring Off-Peak	B8: 2029 Spring Off-Peak	B9: 2034 Spring Off-Peak	B10: 2039 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S2: 2026 SP Heavy Renewable & Min Gas Gen	S3: 2026 OP BESS Charging Sensitivity	S4: 2039 SP LA Basin Hi-gas retirement	
No voltage deviation vialation for P1 and P3 contingencies																		

Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)										Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
					B1: 2026 Summer Peak	B2: 2029 Summer Peak	B3: 2034 Summer Peak	B4: 2039 Summer Peak	B5: 2029 Summer-Off Peak	B6: 2034 Winter Peak	B7: 2026 Spring Off-Peak	B8: 2029 Spring Off-Peak	B9: 2034 Spring Off-Peak	B10: 2039 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S2: 2026 SP Heavy Renewable & Min Gas Gen	S3: 2026 OP BESS Charging Sensitivity	S4: 2039 SP LA Basin Hi-gas retirement	
GOLETA 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.87	Dispatch available resources including energy storage and demand response in the Ventura area and LA Basin for the P7 contingencies for the 2039 summer peak sensitivity scenario with high gas retirement, or install reactive power support facility in the Venrura area as needed. The use of energy storage is subject to verification that it has sufficient MWh capability and can be fully charged when needed.
EAGLROCK 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.88	
RP_EAGLEROCK230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.88	
MOORPARK 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.89	
GOULD 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.89	
ORMOND 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.89	
SAUG TAP 230 kV Bus	line_M_P7_0001_PDCI BIPOLE CONVERTERS	P7	common structure	Low Voltage														0.89	
GOLETA 230 kV Bus	line_V_P7_0054_Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 1 Line PARDEE 230.0 to SYLMAR220 230.0 Circuit 2	P7	common structure	Low Voltage														0.89	
GOLETA 230 kV Bus	line_V_P7_006_line PARDEE to SYLMAR220 230 ck 1 line PARDEE to SYLMAR220 230 ck 2	P7	common structure	Low Voltage														0.89	
MTN PASS 115 kV Bus	Line_P5_TC_Ivnph115_01A_Ivanpah-Cool Water 115 kV Line (Non Redundant Trip Coil Ivanpah CB# 1112)	P5	non-redundant component	Low Voltage	0.90											0.89			Eliminate the P5 contingency if feasible

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			B2: 2029 Summer Peak	B3: 2034 Summer Peak	B7: 2026 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S3: 2026 OP BESS Charging Sensitivity	
01_Lugo500kV - P1.3: 3PH 4 cycle fault at Lugo 500kV w/ loss of Lugo-Victorville 500kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
02_IV500kV - P1.3: 3PH 4 cycle fault at Imperial Valley 500kV w/ loss of Imperial Valley-North Gila 500kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
03_PV500kV - P1.1: 3PH 4 cycle fault at Palo Verde w/ loss of Palo Verde Unit No.1	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
05_Eldorado230kV - P1.3: 3PH 4 cycle fault at Eldorado 230 kV w/ loss of Cima-Eldorado-Pisgah No.1 230 kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
06_Pisgah230kV - P1.3: 3PH 4 cycle fault at Pisgah 230 kV w/ loss of Cima-Eldorado-Pisgah No.1 230 kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
07_Lugo230kV - P1.3: 3PH 4 cycle fault at Lugo 230 kV w/ loss of Lugo-Pisgah No.2 230 kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
12_Eldorado500kV - P1.2: 3PH 4 cycle fault at Eldorado 500kV w/ loss of Eldorado-Mohave 500kV & series cap bypass of Eldordo-Eld_Lugo_11 500kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
13_Eldorado500kV - P1.2: 3PH 4 cycle fault at Eldorado 500kV w/ loss of Eldorado-Mohave 500kV & Lugo-Mohave 500kV line shunt	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
15A_Valley500kV - P1.2: 3PH 4 cycle fault at Valley 500kV w/ loss of Serano-Valley 500kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
16_RanchoVista500kV - P1.2: 3PH 4 cycle fault at Rancho Vista 500kV w/ loss of Rancho Vista-Serrano 500kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
19_SanOnofre230kV - P1.2: 3PH 4 cycle fault at San Onofre 230kV w/ loss of NSONGS-San Onofre No.1 230kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
21_Ellis230kV - P1.2: 3PH 4 cycle fault at Ellis 230kV w/ loss of Ellis-Santiago 230kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
22_NSONGS230kV - P1.2: 3PH 4 cycle fault at NSONGS 230kV w/ loss of NSONGS-Viejo 230kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
24_N.Gila500kV - P1.2: 3PH 4 cycle fault at N.Gila 500kV w/ loss of Hoodoo Wash-N.Gila 500kV w/ loss of Santiago SC	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
25A_Valley500kV - P1.2: 3PH 4 cycle fault at Valley 500kV w/ loss of Serrano-Valley 500kV including loss of Devers SVCs & Cap Bank	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
27_Serrano500kV - P1.2: 3PH 4 cycle fault at Serrano 500kV w/ loss of Mira Loma-Serrano 500kV including loss of Devers SVCs & Cap Bank	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
28_Devers500kV - P1.2: 3PH 4 cycle fault at Devers 230kV w/ loss of Devers-Valley No.2 500kV including loss of Devers SVCs & Cap Bank	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
29_Devers500kV - P1.2: 3PH 4 cycle fault at Devers 500kV w/ loss of Devers-Red Bluff No.2 500kV including loss of Devers SVCs & Cap Bank	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
30_N.Gila500kV - P1.2: 3PH 4 cycle fault at N.Gila 500kV w/ loss of Hoodoo Wash-N.Gila 500kV including loss of Devers SVCs & Cap Bank	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
88_Pisgah230kV - P1.3: 3PH 4 cycle fault at Eldorado 230 kV w/ loss of Cima-Eldorado-Pisgah 230 kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
89_Lugo230kV - P1.3: 3PH 4 cycle fault at Lugo 230 kV w/ loss of Lugo-Pisgah 230 kV	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
001a_P1-2_Sln500kV - P1-2: 3PH 4cycle Sln500kV fault, loss of HAllen-Sloan Cyn 500kV Ckt	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
002_P1-2_HAl500kV - P1-2: 3PH 4cycle HAllen500kV fault, loss of HAllen-Mead 500kV Line [wHAE SC byp]	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
003_P1-2_Cry500kV - P1-2: 3PH 4cycle Crystal500kV fault, loss of Crystal-McCullough 500kV Line [wHAE SC byp]	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
004_P1-2_HAl500kV - P1-2: 3PH 4cycle HAllen500kV fault, loss of HAllen-Crystal N 500kV Line [wHAE SC byp]	P1	Single Contingency	stable	stable	stable	stable	stable	criteria met
020_P2-3_Sln500kV - P2-3: CB SC852 HAllen-Sloan + Sloan Cyn 500/230kV Xfmr 1	P2	Internal Breaker Fault	stable	stable	stable	stable	stable	criteria met
47_Sylmar230kV - P4: 3Ph line fault on Pardee-Sylmar No.2 230 kV with stuck breaker at Sylmar followed by loss of Eagle Rock-Sylmar 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
48_Sylmar230kV - P4: 3Ph line fault on Gould-Sylmar 230 kV with stuck breaker at Sylmar followed by loss of Sylmar Bank 'E'	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
50_Sylmar230kV - P4: 3Ph line fault on Pardee-Sylmar No.1 230 kV with stuck breaker at Sylmar followed by loss of Sylmar Bank 'F'	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
56_Lugo500kV - P4: 3Ph line fault on Lugo-Vincent No.2 500 kV with stuck breaker at Lugo followed by loss of Lugo-Victorville 500 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
57_MiraLoma500kV - P4: 3Ph line fault on Mira Loma-Rancho Vista 500 kV with stuck breaker at Mira Loma followed by loss of Mira Loma-Serrano No.1 500 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
58_MiraLoma230kV - P4: 3Ph line fault on Mira Loma-Walnut 230 kV with stuck breaker at Mira Loma followed by loss of Chino-Mira Loma No.2 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
59_MiraLoma230kV - P4: 3Ph line fault on Mira Loma-Olinda 230 kV with stuck breaker at Mira Loma followed by loss of Chino-Mira Loma No.3 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			B2: 2029 Summer Peak	B3: 2034 Summer Peak	B7: 2026 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S3: 2026 OP BESS Charging Sensitivity	
60_MiraLoma230kV - P4: 3Ph line fault on Mira Loma-Rancho Vista No.1 230 kV with stuck breaker at Mira Loma followed by loss of Mira Loma-Vista No.2 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
61_RanchoVista230kV - P4: 3Ph line fault on Etiwanda-Rancho Vista No.1 230 kV with stuck breaker at Rancho Vista followed by loss of Mira Loma-Rancho Vista No.2 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
62_RanchoVista230kV - P4: 3Ph line fault on Padua-Rancho Vista No.1 230 kV with stuck breaker at Rancho Vista followed by loss of Etiwanda-Rancho Vista No.2 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
63_Serrano230kV - P4: 3Ph line fault on Chino-Serrano 230 kV with stuck breaker at Serrano followed by loss of Lewis-Serrano No.1 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
64_Serrano230kV - P4: 3Ph line fault on Lewis-Serrano No.2 230 kV with stuck breaker at Serrano followed by loss of SONGS-Serrano 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
65_Vincent500kV - P4: 3Ph line fault on Mesa-Vincent 500 kV with stuck breaker at Vincent followed by loss of Midway-Vincent No.2 500 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
66_Vincent500kV - P4: 3Ph line fault on Antelope-Vincent No.1 500 kV with stuck breaker at Vincent followed by loss of Lugo-Vincent No.2 500 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
67_Vincent230kV - P4: 3Ph line fault on Mesa-Vincent No.2 230 kV with stuck breaker at Vincent followed by loss of Santa Clara-Vincent 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
69_Whirlwind500kV - P4: 3Ph line fault on Midway-Whirlwind 500 kV with stuck breaker at Whirlwind followed by loss of Vincent-Whirlwind 500 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
70_Chino230kV - P4: 3Ph line fault on Chino-Viejo 230 kV with stuck breaker at Chino followed by loss of Chino-Serrano 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
71_Ellis230kV - P4: 3Ph line fault on BarreW-Ellis No.2 230 kV with stuck breaker at Ellis followed by loss of Ellis-Santiago 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
72_Ellis230kV - P4: 3Ph line fault on Ellis-Johanna 230 kV with stuck breaker at Ellis followed by loss of BarreW-Ellis No.1 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
73_Goodrich230kV - P4: 3Ph line fault on Goodrich-Gould 230 kV with stuck breaker at Goodrich followed by loss of Goodrich-Mesa 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
77_SantaClara230kV - P4: 3Ph line fault on Moorpark-Santa Clara No.1 230 kV with stuck breaker at Santa Clara followed by loss of Goleta-Santa Clara No.1 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
80_Pardee230kV - P4: 3Ph line fault on Bailey-Pardee 230 kV with stuck breaker at Pardee followed by loss of Pardee-Vincent No.1 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
85_VillaPark230kV - P4: 3Ph line fault on BarreW-Villa Park 230 kV with stuck breaker at Villa Park followed by loss of Serrano-Villa Park No.1 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
86_Lewis230kV - P4: 3Ph line fault on Barre-Lewis 230 kV with stuck breaker at Lewis followed by loss of Lewis-Serrano No.2 230 kV	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
040_P4-2_HAl500kV - P4-2: 3PH line fault at HAllen 500kV, loss of HAE with stuck HAllen CB	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
040a_P4-2_HAl500kV - P4-2: 3PH line fault at HAllen 500kV, loss of HAllen-Sloan with stuck HAllen CB	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
041_P4-2_Eld500kV - P4-2: 3PH line fault at Eldorado 500kV, loss of HAE with stuck Eld CB	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
042_P4-2_Sln500kV - P4-2: 3PH line fault at Sloan 500kV, HAllen-Sloan + Sloan 500/230kV Xfmr [stuck Sloan CB SC852]	P4	stuck breaker	stable	stable	stable	stable	stable	criteria met
122_Midway500kV - P6.1: 3PH 4 cycle fault at Midway 500 kV w/ loss of Midway-Vincent No.1 & Midway-Whirlwind No.3 + No RAS	P6	overlapping singles	stable	stable	stable	stable	stable	criteria met
128_IPPDC_bipole - P7.2: SLG fault at Adelanto 500kV followed by loss of IPP Bipole Converters with North-to-South flow	P7	common structure	stable	stable	stable	stable	stable	criteria met
129_PDCI_bipole_SPS - P7.2: SLG fault at Sylmar SCE followed by loss of PDCI Bipole with North-to-South flow	P7	common structure	stable	stable	stable	stable	stable	criteria met
144_MiraLoma500kV - P7.1: 1PH 4 cycle fault at Mira Loma 500kV w/ loss of Mesa-Mira Loma 500kV & Chino-Mira Loma No.3 230kV	P7	common structure	stable	stable	stable	stable	stable	criteria met
070a_P7-1_HAl500kV - P7-1: 3PH 4cycle HAllen500kV fault, loss of HAM + HA-Sln 500kV Lines [No RAS]	P7	common structure	stable	stable	stable	stable	stable	criteria met
071a_P7-1_HAl500kV - P7-1: 3PH 4cycle HAllen500kV fault, loss of HAM + HA-Sln 500kV Lines [wRAS]	P7	common structure	stable	stable	stable	stable	stable	criteria met

2024-2025 ISO Reliability Assessment - Study Results
Study Area: **SCE Main System including East of Lugo**
Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)														Potential Mitigation Solutions
			Post Cont. Voltage Deviation % (Baseline Scenarios)										Post Cont. Voltage Deviation % (Sensitivity Scenarios)				
			B1: 2026 Summer Peak	B2: 2029 Summer Peak	B3: 2034 Summer Peak	B4: 2039 Summer Peak	B5: 2029 Summer-Off Peak	B6: 2034 Winter Peak	B7: 2026 Spring Off-Peak	B8: 2029 Spring Off-Peak	B9: 2034 Spring Off-Peak	B10: 2039 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S2: 2026 SP Heavy Renewable & Min Gas Gen	S3: 2026 OP BESS Charging Sensitivity	S4: 2039 SP LA Basin Hi-gas retirement	

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

Substation	Load Served (MW)															Potential Mitigation Solutions
	2026 Summer Peak	Post Cont. Voltage Deviation % (Baseline Scenarios)										Post Cont. Voltage Deviation % (Sensitivity Scenarios)				
		B1: 2026 Summer Peak	B2: 2029 Summer Peak	B3: 2034 Summer Peak	B4: 2039 Summer Peak	B5: 2029 Summer-Off Peak	B6: 2034 Winter Peak	B7: 2026 Spring Off-Peak	B8: 2029 Spring Off-Peak	B9: 2034 Spring Off-Peak	B10: 2039 Spring Off-Peak	S1: 2029 SP High CEC Forecast	S2: 2026 SP Heavy Renewable & Min Gas Gen	S3: 2026 OP BESS Charging Sensitivity	S4: 2039 SP LA Basin Hi-gas retirement	

No single source substation with more than 100 MW