

2024-2025 ISO Reliability Assessment - Study Results

Study Area: **PG&E Central Valley**



Thermal Overloads

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Bellota - Riverbank - Melones SW STA 115 kV Line	P2-4:A11-9:_TESLA 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	165.06	N/A	N/A	N/A	N/A	N/A	NConv	NConv	N/A	Project: Tesla 115 kv Bus Reconfiguration Project
	BELLOTA 230/115KV TB 1 & BELLOTA 230/115KV TB 2	P6	N-1-1	<100	<100	104.37	<100	<100	<100	126.72	107.93	<100	Continue to monitor
	R/N J/N/CN-RIPON #1 115KV [0] MOAS OPENED ON VLYHMTPT1_VALLY HM & STANISLAUS-MELONES SW STA-MANTECA #1 115KV [3830] MOAS OPENED ON STANISLAUSPH_FRGINTPT1	P6	N-1-1	<100	<100	<100	<100	<100	<100	99.60	100.08	<100	Continue to monitor
Bellota-Riverbank-Melones 115 kV Line	P5-5C:A11:12:_MANTECA 115-60KV BATT (FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply/Relay	109.64	105.13	104.19	128.72	144.99	147.20	110.52	134.81	103.24	Add Redundant battery
	P5-5A:A11:11:_TESLA 115KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant battery supply/Relay	62.66	141.15	NConv	36.48	126.19	81.34	NConv	NConv	114.69	Add Redundant relay
Bellota 230/115 kV Transformer No. 2	P2-4:A11-9:_TESLA 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	44.43	N/A	N/A	N/A	N/A	N/A	NConv	NConv	N/A	Continue to monitor
Brighton - Bellota 230 kV Line	P5-5C:A5:1:_RIO OSO 230-115KV BATT (FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply/Relay	130.99	125.13	N/A	22.68	54.18	12.46	49.98	45.01	131.27	Add Redundant battery
Brighton - Davis 115 kV Line	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	105.37	105.52	138.15	18.32	51.67	12.70	44.37	42.30	107.37	Add Redundant relay
	WOODLAND-DAVIS 115KV [4210] & BRIGHTN-W-SCRMNO 115KV [0]	P6	N-1-1	147.83	148.14	176.67	<100	<100	<100	<100	<100	150.61	Project: Vaca Dixon Area Reinforcement Project
	BRIGHTN-W-SCRMNO 115KV [0] & WOODLAND-DAVIS 115KV [4210]	P6	N-1-1	127.03	127.57	149.13	<100	<100	<100	<100	<100	130.34	Project: Vaca Dixon Area Reinforcement Project
Brighton 230/115 kV Transformer No. 9	P1-2:A11:4:_BRIGHTON-BELLOTA 230KV [4420]	P1	N-1	69.37	41.00	N/A	95.77	45.50	89.25	105.20	99.20	N/A	Sensitivity only
	RIO OSO-LOCKEFORD 230KV [5620] & BRIGHTON-BELLOTA 230KV [4420]	P6	N-1-1	<100	<100	<100	<100	<100	<100	126.50	<100	<100	Sensitivity only
Colgate-Palermo 60 kV Line	P7-1:A11:38:_BRIGHTON-BELLOTA 230KV [4420] & RIO OSO-LOCKEFORD 230KV [5620]	P7	DCTL	69.37	N/A	N/A	N/A	18.87	N/A	102.75	17.50	N/A	Sensitivity only
	COLGATE1 230/60KV TB 3 & NARROWSPH2 13.80KV GEN UNIT 1	P3	G-1 / N-1	99.79	99.69	101.13	<100	<100	<100	<100	<100	99.88	Continue to monitor
	TABLE MTN-RIO OSO 230KV [5700] & PALERMO-COLGATE 230KV [5360]	P6	N-1-1	99.88	101.49	101.47	<100	<100	<100	<100	<100	101.75	Summer setup
	P7-1:A5:6:_Table Mountain-Rio Oso 230 kV Line & Palermo-Colgate 230 kV Line	P7	DCTL	119.50	105.98	109.90	36.36	37.00	39.17	64.76	51.74	108.17	Summer setup
Cortina 230/115/60 kV Transformer No. 1	P1-3:A4:6:_CORTINA 230/115KV TB 4	P1	N-1	100.38	N/A	104.32	16.20	N/A	11.48	65.00	78.88	78.88	Project: Cortina 60KV reinforcement
	CORTINA 115/60KV TB 5 & Q1455SPV 0.60KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	<100	<100	<100	<100	170.73	118.41	<100	Sensitivity only
	CORTINA 115/60KV TB 5 & Q1455C2-Q1455C1 #1 35KV [0]	P6	N-1-1	<100	<100	<100	<100	<100	<100	171.43	118.45	<100	Sensitivity only
Cortina 60 kV Line No. 3	Base Case	P0	N0	200.14	203.45	164.84	23.75	61.02	16.53	144.01	61.13	205.67	Project: Cortina #3 60 kV Reconductoring Project
Delta Switching Yard - Tesla 230 kV Line	P2-3:A4:4:_BOLSWSTA 230KV - MIDDLE BREAKER BAY 2	P2-3	Non-Bus-Tie Breaker	40.19	39.88	54.51	83.06	32.10	60.61	102.23	39.00	39.31	Sensitivity only
Dixon-Vaca #1 60 kV	P1-2:A4:58:_DIXON-VACA #2 60KV [6740]	P1	N-1	120.92	121.08	103.22	16.81	38.18	38.00	89.67	38.32	129.50	Project: Vaca Dixon Area Reinforcement Project
Drum - Grass Valley - Weimar 60 kV Line	P1-2:A5:60:_COLGATE-GRASS VALLEY 60KV [6490]	P1	N-1	<100	111.60	77.58	22.20	11.92	46.80	73.13	11.98	100.73	Existing RAS
	COLGATE-GRASS VALLEY 60KV [6490] & ROLLINS 6.60KV GEN UNIT 1	P3	G-1 / N-1	<100	114.41	<100	<100	<100	<100	<100	<100	117.35	Existing RAS
Drum - Higgins 115 kV Line	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	133.41	135.20	229.62	46.58	24.73	91.68	35.14	24.70	140.34	Add Redundant relay
Drum - Rio Oso 115 kV No. 1 Line	P2-4:A5:19:_GOLDHILL 230KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	NConv	N/A	N/A	N/A	34.14	N/A	59.25	36.55	N/A	Project: Gold Hill 230/115 kv Transformer Additoin Project. Short term: Action Plan
Drum 115/60 kV Transformer No. 1	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	24.78	25.36	51.27	35.41	31.49	104.05	21.40	31.99	25.50	Add Redundant relay
	DRUM-HIGGINS 115KV [4393] MOAS OPENED ON CHCGO PK_HIGGINS & RIO OSO-DRUMPH1-BRUNSWCK 115KV [0]	P6	N-1-1	<100	<100	<100	<100	<100	104.86	<100	<100	<100	Continue to monitor
	PLACER-GOLD HILL #1 115KV [3340] & DRUM-HIGGINS 115KV [4393] MOAS OPENED ON CHCGO PK_HIGGINS	P6	N-1-1	<100	<100	101.24	<100	<100	<100	<100	<100	<100	Continue to monitor
El Dorado-Missouri Flat #1 115KV	P2-1:A5:9:_MISSOURI FLAT-GOLD HILL #2 115KV [2670] (GOLDHILL-SHPRING2)	P2-1	Line Section w/o Fault	179.18	183.42	261.67	14.62	49.66	47.93	59.34	49.61	189.12	Project: Gold Hill-El Dorado Reinforcement Project
El Dorado-Missouri Flat #2 115KV	P2-1:A5:9:_MISSOURI FLAT-GOLD HILL #2 115KV [2670] (GOLDHILL-SHPRING2)	P2-1	Line Section w/o Fault	218.48	223.34	318.58	13.07	71.59	39.33	78.98	71.37	229.78	Project: Gold Hill-El Dorado Reinforcement Project

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Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Gold Hill 230/115 kV Transformer No. 2	P2-4:A5:4:_GOLDHILL 230KV - SECTION 2E & 2D	P2-4	Bus-Tie-Breaker	N/A	83.54	100.38	15.30	83.54	38.12	N/A	N/A	85.63	Operation solution
Hammer - Country Club 60 kV	P1-2:A11:92:_LOCKEFORD #1 60KV [9461]	P1	N-1	73.66	74.78	40.26	49.76	68.98	58.86	177.35	169.80	73.00	Sensitivity only
	LOCKEFORD 230/60KV TB 3 & LOCKEFORD 230/60KV TB 2	P6	N-1-1	<100	109.67	<100	<100	<100	<100	<100	<100	110.53	Existing RAS
	P7-1:A11:18:_STAGG-COUNTRY CLUB #1 60KV [8080] & STAGG-COUNTRY CLUB #2 60KV [8090]	P7	DCTL	118.20	76.99	90.68	11.24	52.39	24.00	60.03	46.21	79.06	Existing RAS
Higgins - Bell 115 kV Line	P7-1:A5:19:_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	94.39	95.60	168.21	25.00	37.94	24.52	40.70	37.69	98.69	Continue to monitor
Kasson - Louise 60 kV Line	P5-5A:A11:14:_KASSON 115KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant battery supply/Relay	183.64	108.27	116.25	34.38	38.12	24.00	129.04	38.17	108.71	Add Redundant relay
Lockeford - Bellota 230 kV Line	P2-4:A11:22:_STAGG-D SECTION 1D & STAGG-E SECTION 1E 230KV	P2-4	Bus-Tie-Breaker	28.53	99.65	N/A	44.03	24.63	44.00	45.00	45.00	100.70	Sensitivity only
	P4-2:A11:1:_STUCK BREAKER & NO BF RELAY STAGG 230 KV CB252	P5	Non-Redundant battery supply/Relay	21.50	99.22	N/A	43.75	24.63	44.00	45.00	45.00	100.31	Sensitivity only
	STAGG-E 230/60KV TB 4 & STAGG-D 230/60KV TB 1	P6	N-1-1	<100	99.97	<100	<100	<100	<100	<100	<100	101.01	Sensitivity only
Lockeford - Industrial 60 kV Line	P1-2: LOCKEFRD-VICTOR-INDUSTR 60KV [0]	P1	N-1	100.20	98.40	<100	88.60	<100	83.70	<100	<100	<100	Project: Lockeford - Lodi Area 230 kV Development
	P2-1: LOCKEFRD-LDDI #2 60KV [7440] (LOCKEFRD-VICTOR_JCT)	P2-1	Line Section w/o Fault	107.20	106.10	<100	91.50	<100	82.30	<100	<100	<100	Project: Lockeford - Lodi Area 230 kV Development
Lockeford - Lodi 60 kV Line No. 2	P1-2:A11:93:_LOCKEFORD-INDUSTRIAL 60KV [7420]	P1	N-1	100.85	100.52	43.79	87.76	60.71	100.47	129.95	126.71	16.53	Project: Lockeford - Lodi Area 230 kV Development
Lockeford 230/60 kV Transformer No. 3	P4-2:A11:1:_STUCK BREAKER & NO BF RELAY STAGG 230 KV CB252	P5	Non-Redundant battery supply/Relay	47.13	100.66	69.99	48.73	39.74	31.45	41.78	38.98	101.03	Add Redundant relay
Lockeford No. 1 60 kV Line	P1-2:A11:88:_HAMMER-COUNTRY CLUB 60KV [7010] MOAS OPENED ON MORADAJF_MSHR 60V	P1	N-1	<100	76.95	34.17	67.41	43.94	83.33	113.94	108.40	<100	Sensitivity only
Manteca - Louise 60 kV Line	P5-5A:A11:14:_KASSON 115KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant battery supply/Relay	118.66	70.27	75.62	23.02	25.39	7.60	83.56	25.42	70.55	Add Redundant relay
Manteca - Vierra 115 kV Lin	P2-4:A11:9:_TESLA 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	41.43	N/A	N/A	N/A	N/A	N/A	NConv	NConv	N/A	Project: Tesla 115 kV Bus Reconfiguration Project
Missouri Flat - Gold Hill 115 kV No. 1 Line	P2-1:A5:9:_MISSOURI FLAT-GOLD HILL #2 115KV [2670] (GOLDHILL-SHRPING2)	P2-1	Line Section w/o Fault	76.54	78.30	112.11	6.16	22.26	20.07	26.10	22.31	80.68	Continue to monitor
New Bellota-Lockeford 230 kV line	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply/Relay	N/A	N/A	119.12	N/A	N/A	N/A	N/A	N/A	N/A	Add Redundant battery
New Brighton-Lockeford 230 kV Line	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply/Relay	N/A	N/A	169.30	N/A	N/A	N/A	N/A	N/A	N/A	Add Redundant battery
Nicolaus - Marysville 60 kV Line	P2-3:A5:87:_E_NICOLS 115KV - RING R1 & R5	P2-3	Non-Bus-Tie Breaker	89.21	101.53	139.95	4.74	49.53	34.69	35.61	49.34	105.95	Disable automatics
	E.MRYSV E-MRYSVLE #1 60KV [0] & NARROWSPH2 13.80KV GEN UNIT 1	P3	G-1 / N-1	<100	104.14	<100	<100	<100	<100	<100	<100	106.21	Disable automatics
	RIO OSO-NICOLAUS 115KV [3440] & PALERMO-NICOLAUS 115KV [3210] MOAS OPENED ON PALERMO_E.MRY J2	P6	N-1-1	107.53	<100	<100	<100	<100	<100	<100	<100	<100	Disable automatics
	P7-1:A5:20:_Palermo-Pease 115 kV Line amd Pease-Rio Oso 115 kV Line	P7	DCTL	18.68	2.95	31.71	30.18	80.76	28.58	105.48	90.74	3.44	Disable automatics
Placer - Bell 115 kV Line	P2-4:A5:19:_GOLDHILL 230KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	NConv	N/A	N/A	N/A	144.27	N/A	134.48	144.07	N/A	Project: Gold Hill 230/115 kV Transformer Additoin Project. Short term: Action Plan
	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	83.20	84.54	146.99	7.60	34.64	25.05	35.05	34.18	87.35	Add Redundant relay
Placer - Gold Hill 115 kV Line No. 1	PLACER-GOLD HILL #2 115KV [4290] & DRUM-HIGGINS 115KV [4393] MOAS OPENED ON CHCGO PK_HIGGINS	P6	N-1-1	82.62	96.05	114.29	<100	<100	<100	<100	<100	99.06	Continue to monitor
Placer - Gold Hill 115 kV Line No. 2	PLACER-GOLD HILL #1 115KV [3340] & DRUM-HIGGINS 115KV [4393] MOAS OPENED ON CHCGO PK_HIGGINS	P6	N-1-1	94.27	104.77	123.54	<100	<100	<100	<100	<100	107.37	Operation solution
Placer 115/60 kV Transformer No. 1	Base Case	P0	NO	85.07	85.94	108.20	12.67	33.37	34.00	27.48	33.51	88.11	Continue to monitor
Rancho Seco - Bellota 230 kV Line No. 2	RANCHO SECO-BELLOTA #1 230KV [5550] & GOLD HILL - LAKE 230KV [1]	P6	N-1-1	<100	<100	<100	<100	<100	100.21	99.55	<100	<100	Continue to monitor
Rio Oso - Linkon 115 kV Line	ATLANTIC-GOLD HILL 230KV [4330] & RIO OSO-ATLANTIC 230KV [5590]	P6	N-1-1	114.79	<100	104.47	<100	<100	<100	<100	<100	<100	Operation solution
Rio Oso - Brighton 230 kV Line	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	92.41	86.71	106.49	16.03	47.25	25.15	65.25	63.79	87.83	Add Redundant relay

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Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Rio Oso - West Sacramento 115 kV Line	P2-3:A4:21:_BRIGHTN - ME 115KV & BRIGHTON-DAVIS LINE	P2-3	Non-Bus-Tie Breaker	104.29	106.18	58.64	25.60	51.84	8.50	51.63	45.65	108.67	Project: Rio oso-w sacramento rectoring
	BRIGHTON-BELLOTA 230KV [4420] & RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	112.88	117.11	<100	<100	<100	<100	<100	<100	122.33	Project: Rio oso-w sacramento rectoring
Riverbank Jct - Ripon 115 kV Line	P5-SA:A11:11:_TESLA 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	52.80	105.71	NConv	23.48	79.99	60.89	NConv	NConv	88.17	Add Redundant relay
Riverbank Jct SW STA - Ripon 115 kV	P2-3:A11:26:_TESLA - 1D 115KV & TESLA-SCHULTE SW STA #1 LINE	P2-3	Non-Bus-Tie Breaker	35.20	N/A	N/A	N/A	40.63	N/A	117.81	108.40	N/A	Project: Manteca-Ripon-Riverbank-Melones Area 115 kV Line Reconducting Stanislaus-Manteca rebuild oriect
	P2-4:A11:9:_TESLA 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	138.93	N/A	N/A	N/A	N/A	N/A	NConv	NConv	N/A	Project: Tesla 115 kV Bus Reconfiguration Project
	MELONES-MANTECA 115KV [0] MOAS OPENED ON STANISLAUSPH_FRGNTNP1 & STANISLAUS-MANTECA #2 115KV [3820]	P6	N-1-1	<100	<100	<100	100.46	<100	89.92	<100	95.02	<100	Continue to monitor
Schulte - Kasson - Manteca 115 kV Line	SCHULTE SW STA-LAMMERS 115KV [3993] & TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC	P6	N-1-1	136.88	108.79	119.73	<100	<100	<100	<100	<100	104.82	Operation solution
Smartville - Nicolaus 60 kV No. 2 Line	P5-SA:A5:2:_RIO OSO 230 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	102.58	97.19	108.47	27.81	56.45	32.23	76.67	63.89	98.41	Add Redundant relay
	RIO OSO-NICOLAUS 115KV [3440] & PALERMO-NICOLAUS 115KV [3210] MOAS OPENED ON E.MRY J2_E_NICOLS	P6	N-1-1	<100	<100	106.11	<100	<100	<100	<100	<100	<100	Continue to monitor
Stagg - Hammer 60 kV Line No 1	LOCKFORD 230/60KV TB 3 & LOCKFORD 230/60KV TB 2	P6	N-1-1	<100	153.67	126.91	101.28	<100	<100	<100	<100	155.17	Existing RAS
	P7-1:A11:18:_STAGG-COUNTRY CLUB #1 60KV [8080] & STAGG-COUNTRY CLUB #2 60KV [8090]	P7	DCTL	141.10	106.09	129.48	18.44	61.52	<100	74.02	56.29	108.81	Existing RAS
	P7-1:A11:24:_RIO OSO-LOCKFORD 230KV [5620] & LOCKFORD-BELLOTA 230KV [4990]	P7	DCTL	60.45	153.59	63.88	101.58	26.00	83.96	33.11	25.24	155.09	Existing RAS
Stanislaus - Melones SW STA - Riverbank JCT SW STA 115 kV Line	P1-2:A12:11:_MELONES-MANTECA 115KV [0] MOAS OPENED ON STANISLAUSPH_FRGNTNP1	P1	N-1	37.42	58.75	105.63	34.22	38.75	10.46	<100	<100	108.93	Continue to monitor
	P2-1:A11:35:_RIPON-MANTECA 115KV [1062] (RPN)2-MANTECA)	P2-1	Line Section w/o Fault	17.40	90.68	51.55	106.83	62.96	137.08	223.20	209.63	35.82	Continue to monitor
	MANTECA-RIPON 115KV [0] & STANISLAUSPH 13.80KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	105.76	<100	<100	<100	<100	<100	<100	Continue to monitor
	MANTECA-MELONES 115KV [0] MOAS OPENED ON STANISLAUSPH_FRGNTNP1 & STANISLAUSPH 13.80KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	<100	100.34	<100	<100	101.03	96.87	<100	Continue to monitor
	P5-SC:A11:9:_TESLA 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	100.87	NConv	NConv	138.75	33.73	49.51	NConv	NConv	150.01	Add Redundant battery
	P5-SA:A11:11:_TESLA 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	92.74	179.82	NConv	115.68	87.13	<100	NConv	NConv	148.34	Add Redundant relay
	BELLOTA 230/115KV TB 2 & BELLOTA 230/115KV TB 1	P6	N-1-1	<100	<100	111.50	<100	<100	<100	<100	<100	<100	Continue to monitor
Stanislaus-Melones-Manteca 115 kV Line No. 1	P2-4:A11:9:_TESLA 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	126.22	N/A	N/A	N/A	N/A	N/A	NConv	NConv	N/A	Project: Tesla 115 kV Bus Reconfiguration Project
	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2-4	Bus-Tie-Breaker	18.02	13.29	116.23	14.00	17.29	13.09	88.21	58.98	25.73	Continue to monitor
	STANISLAUSPH-MELONES-RIVRBJKT 115KV [0] & Q1109BESS 34.50KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	<100	90.27	<100	<100	100.33	100.38	<100	Continue to monitor
	P5-SC:A11:9:_TESLA 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	101.92	NConv	NConv	119.52	38.38	40.09	NConv	NConv	143.39	Add Redundant battery
	P5-SA:A11:11:_TESLA 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	96.48	154.55	NConv	109.20	42.10	31.37	NConv	NConv	132.18	Add Redundant relay
	BELLOTA 230/115KV TB 2 & BELLOTA 230/115KV TB 1	P6	N-1-1	<100	<100	108.29	<100	<100	<100	<100	<100	<100	Continue to monitor
	STANISLAUS-MANTECA #2 115KV [3820] & STANISLAUSPH-MELONES-RIVRBJKT 115KV [0]	P6	N-1-1	<100	<100	<100	106.71	<100	101.42	98.88	99.01	<100	Continue to monitor
Stockton 'A' - Lockeford - Bellota 115 kV Line No. 2	P2-3:A11:39:_BELLOTA - 1D 115KV & BELLOTA-RIVERBANK LINE	P2-3	Non-Bus-Tie Breaker	83.35	82.94	112.71	15.25	38.43	14.39	27.03	26.82	84.54	Continue to monitor
Tesla - Salado - Manteca 115 kV Line	P5-SA:A11:14:_KASSON 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	136.74	52.11	71.74	13.91	42.72	<100	94.51	58.01	46.76	Add Redundant relay
Tesla - Schulte 115 kV Line No. 1	P2-3:A11:28:_TESLA - 1D 115KV & TESLA-LAWRENCE LAB LINE	P2-3	Non-Bus-Tie Breaker	47.61	N/A	N/A	N/A	N/A	N/A	121.48	91.59	N/A	Continue to monitor
	TESLA-SCHULTE SW STA #1 115KV [3980] & GWFTRCY3 18.00KV & GWFTRCY1 13.80KV & GWFTRCY2 13.80KV GEN UNITS	P3	G-1 / N-1	104.09	96.70	110.95	<100	<100	<100	<100	<100	93.41	Operation solution
	SCHULTE - GWFTRCY 115KV [1] & TESLA-SCHULTE SW STA #2 115KV [3980]	P6	N-1-1	103.13	95.75	110.60	<100	<100	<100	<100	<100	92.48	Operation solution

2024-2025 ISO Reliability Assessment - Study Results

Study Area:

PG&E Central Valley



Thermal Overloads

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Tesla - Tracy 115 kv Line	P5-SC:A11:19:_SCHULTE SW STA 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	140.23	106.37	137.93	21.73	51.96	<100	93.27	65.92	102.69	Add Redundant battery
	P5-SA:A11:14:_KASSON 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	53.05	80.60	104.68	14.92	24.23	<100	32.84	23.86	77.52	Add Redundant relay
	SCHULTE SW STA-KASSON-MANTECA 115KV [7472] & SCHULTE SW STA-LAMMERS 115KV [3993]	P6	N-1-1	129.61	101.83	124.79	<100	<100	<100	93.61	<100	99.68	Operation solution
Tesla-Schulte SW STA #2 115 kv Line	TESLA-SCHULTE SW STA #1 115KV [3970] & GWFTRCY3 18.00KV & GWFTRCY1 13.80KV & GWFTRCY2 13.80KV GEN UNITS	P3	G-1 / N-1	103.64	96.25	111.13	<100	<100	<100	<100	<100	92.99	Operation solution
	TESLA-SCHULTE SW STA #1 115KV [3970] & SCHULTE - GWFTRCY 115KV [1]	P6	N-1-1	102.68	95.31	110.22	<100	<100	<100	<100	<100	92.05	Operation solution
Tiger Creek - Electra 230 kv Line	VALLEY SPRINGS-BELLOTA 230KV [5860] & WOODLANDBIOM 13.80KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	101.4	<100	<100	<100	<100	<100	<100	Continue to monitor
	P5-SC:A11:1:_TESLA 500KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	109.44	85.66	82.69	43.90	19.55	23.59	105.32	83.49	85.43	Add Redundant battery
Vaca - Parkway 230 kv Line	P5-SC:A11:9:_TESLA 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	80.36	NConv	NConv	60.67	37.13	38.18	NConv	NConv	66.06	Add Redundant battery
Valley Springs 230/60 kv Transformer No. 1	VLLY SPS 230/60KV TB 2 & WOODLANDBIOM 13.80KV GEN UNIT 1	P3	G-1 / N-1	<100	<100	102.15	<100	<100	<100	<100	<100	<100	Continue to monitor
	VLLY SPS 230/60KV TB 2 & RIO OSO-WOODLAND #2 115KV [3470]	P6	N-1-1	<100	<100	101.90	<100	<100	<100	<100	<100	<100	Continue to monitor
Vierra - Tracy - Kasson 115 kv Line	P1-2:A11:52:_TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC	P1	N-1	<100	87.98	30.52	42.86	67.00	42.41	113.31	120.14	<100	Sensitivity only
	P5-SC:A11:19:_SCHULTE SW STA 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	135.10	79.60	110.77	8.17	44.58	14.62	94.48	66.54	73.00	Add Redundant battery
	VIERRA-TESLA 115KV [0] & TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC	P6	N-1-1	<100	91.20	104.46	<100	<100	<100	<100	<100	<100	Continue to monitor
Weber 60 kv Line No. 2 (Weber - French Camp)	P1-2:A11:78:_WEBER-FRENCH CAMP #1 60KV [8320]	P1	N-1	112.41	139.58	27.08	41.14	52.64	36.70	101.54	102.85	19.05	Project: French Camp Reinforcemet Project
West Sacramento - Brighton 115 kv Line	P5-SC:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	105.75	97.65	135.21	19.32	43.38	<100	43.56	37.37	102.32	Add Redundant battery
West Sacramento - Davis 115 kv Line	P7-1:A4:17:_Rio Oso-West Sacramento 115 kv Line & West Sacramento-Brighton 115 kv Line	P7	DCTL	88.77	89.34	106.32	25.46	39.98	<100	54.53	39.27	91.04	Project: Vaca Dixon Area Reinforcement Project
Woodland-Davis 115 kv Line	P2-3:A4:18:_BRIGHTN - ME 115KV & BRIGHTN-W.SCRMNO LINE	P2-3	Non-Bus-Tie Breaker	107.52	75.47	86.68	<100	56.28	<100	44.81	40.66	77.21	Project: Vaca Dixon Area Reinforcement Project
	P5-SA:A4:7:_BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant battery supply/Relay	120.41	101.62	123.71	27.38	59.94	10.73	55.98	53.45	104.18	Add Redundant relay
	RIO OSO-BRIGHTON 230KV [5600] & BRIGHTON-BELLOTA 230KV [4420]	P6	N-1-1	118.53	<100	<100	<100	<100	<100	<100	<100	<100	Project: Vaca Dixon Area Reinforcement Project
	BRIGHTON-BELLOTA 230KV [4420] & RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	118.82	100.80	<100	<100	<100	<100	<100	<100	102.43	Project: Vaca Dixon Area Reinforcement Project

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
CARBONA 60 kV	P5-5A:A11:14: KASSON 115KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	0.92	0.95	0.91	1.02	1.05	1.03	0.90	1.01	0.95	System adjustments or voltage support if needed
EL DORADO PH 115 kV	P2-1:A5:9:_MISSOURI FLAT-GOLD HILL #2 115KV [2670] (GOLDHILL-SHPRING2)	P2	Line Section w/o Fault	0.89	0.89	0.89	1.05	1.07	1.07	1.01	1.05	0.86	Project: Gold Hill-El Dorado Reinforcement Project
GRAND ISLAND 115 kV	P5-5A:A4:7:_BRIGHTON 230KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant battery supply/Relay	0.92	0.91	0.92	1.02	1.08	1.07	1.00	1.02	0.89	System adjustments or voltage support if needed
LOCKEFORD 230 kV	P1-2:A11:5:_LOCKEFORD-BELLOTA 230KV [4990] & P1-1:A5:11:_COLGATE1 13.80KV GEN UNIT 1	P3	G-1 / N-1	0.89	>.95	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Project: Lockeford-Lodi Area 230 kV Development project
LOCKEFORD 230 kV	P1-2:A11:5:_LOCKEFORD-BELLOTA 230KV [4990]	P1	N-1	0.90	0.91	0.96	0.96	0.98	0.97	0.94	0.96	0.90	Project: Lockeford-Lodi Area 230 kV Development project
PLACER 115 kV	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	0.92	0.92	0.60	1.04	1.11	1.10	1.01	1.04	0.91	System adjustments or voltage support if needed
PLACER 115 kV	P7-1:A5:19_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.92	0.92	0.60	1.04	1.11	1.10	1.01	1.04	0.91	System adjustments or voltage support if needed
BELL 115 kV	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	0.92	0.92	0.61	1.05	1.10	1.10	1.01	1.04	0.92	System adjustments or voltage support if needed
BELL 115 kV	P7-1:A5:19_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.92	0.93	0.61	1.05	1.11	1.10	1.01	1.04	0.92	System adjustments or voltage support if needed
WEIMAR 60 kV	P1-1:A5:28:_ROLLINS 6.60KV GEN UNIT 1	P1	N-1	0.93	0.93	0.90	0.98	1.02	1.01	0.97	0.98	0.93	System adjustments or voltage support if needed
COUNTRY CLUB 60 kV	P2-4:A11:22:_STAGG-D SECTION 1D & STAGG-E SECTION 1E 230KV	P2	Bus-Tie-Breaker	0.93	0.48	0.37	<.95	1.05	1.00	<.95	<.95	0.48	System adjustments or voltage support if needed
EAST MARYSVILLE 115 kV	P2-1:A5:13:_PALERMO-NICOLAUS 115KV [3210] (E.MRYSVE-E.MRY J2)	P2	Line Section w/o Fault	<.95	1.12	0.88	<.95	1.13	1.14	<.95	<.95	1.12	System adjustments or voltage support if needed
MOSHER 60 kV	P2-4:A11:22:_STAGG-D SECTION 1D & STAGG-E SECTION 1E 230KV	P2	Bus-Tie-Breaker	0.91	0.56	0.51	<.95	1.05	1.01	<.95	<.95	0.55	System adjustments or voltage support if needed
COUNTRY CLUB 60 kV	P4-2:A11:1:_STUCK BREAKER & NO BF RELAY STAGG 230 KV CB252	P5	Non-Redundant battery supply/Relay	<.95	0.48	0.36	<.95	1.05	1.00	<.95	<.95	0.48	System adjustments or voltage support if needed
MOSHER 60 kV	P4-2:A11:1:_STUCK BREAKER & NO BF RELAY STAGG 230 KV CB252	P5	Non-Redundant battery supply/Relay	<.95	0.56	0.50	<.95	1.05	1.01	<.95	<.95	0.55	System adjustments or voltage support if needed
SUTTER HOME SWITCHING STATION 60 kV	P4-2:A11:1:_STUCK BREAKER & NO BF RELAY STAGG 230 KV CB252	P5	Non-Redundant battery supply/Relay	<.95	0.47	0.33	<.95	1.02	0.97	<.95	<.95	0.46	System adjustments or voltage support if needed
COUNTRY CLUB 60 kV	P7-1:A11:34:_EIGHT MILE ROAD-STAGG 230KV [5002] & STAGG-TESLA 230KV [5680]	P7	DCTL	<.95	NConv	0.28	<.95	1.05	1.10	<.95	<.95	NConv	System adjustments or voltage support if needed
HAMMER 60 kV	P7-1:A11:34:_EIGHT MILE ROAD-STAGG 230KV [5002] & STAGG-TESLA 230KV [5680]	P7	DCTL	<.95	NConv	0.29	<.95	1.05	1.10	<.95	<.95	NConv	System adjustments or voltage support if needed
LODI 60 kV	P7-1:A11:24:_RIO OSO-LOCKEFORD 230KV [5620] & LOCKEFORD-BELLOTA 230KV [4990]	P7	DCTL	<.95	0.34	1.02	<.95	0.46	0.42	<.95	<.95	0.34	Project: Lockeford-Lodi Area 230 kV Development project
GOLD HILL 115 kV	P5-5A:A5:3:_GOLD HILL 230 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	NConv	NConv	NConv	1.03	1.16	1.05	1.05	1.03	NConv	System adjustments or voltage support if needed
WEST SACRAMENTO 115 kV	P2-3:A4:21:_BRIGHTN - ME 115KV & BRIGHTON-DAVIS LINE	P2	Non-Bus-Tie Breaker	0.94	0.94	0.90	1.03	1.07	1.05	1.01	1.03	0.93	Continue to monitor
CORTINA 230 kV	P2-3:A4:55:_CORTINA 230KV - RING R2 & R3	P2	Non-Bus-Tie Breaker	0.94	0.89	0.94	1.01	1.11	1.12	0.96	1.00	0.94	System adjustments or voltage support if needed

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
DAVIS 115 kV	P2-3:A4:21:_BRIGHTN - ME 115KV & BRIGHTON-DAVIS LINE	P2	Non-Bus-Tie Breaker	0.94	0.94	0.90	1.03	1.07	1.05	1.01	1.03	0.94	Continue to monitor
CORTINA 115 kV	P2-3:A4:58:_CORTINA 230KV - RING R1 & R4	P2	Non-Bus-Tie Breaker	0.96	0.93	0.99	1.03	1.12	1.11	0.99	1.02	0.97	System adjustments or voltage support if needed
BRIGHTON 230 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	0.96	0.96	0.89	1.01	1.03	1.03	1.00	1.01	0.95	Continue to monitor
EAST NICOLAUS 115 kV	P2-3:A5:87:_E.NICOLS 115KV - RING R1 & R5	P2	Non-Bus-Tie Breaker	1.01	1.00	0.79	1.13	1.09	1.06	1.05	1.13	1.00	Continue to monitor
TESLA 115 kV	P2-4:A11:8:_TESLA D 230KV - SECTION 1D & 2D	P2	Bus-Tie-Breaker	1.01	1.01	0.97	1.03	1.02	1.03	0.90	1.00	1.02	System adjustments or voltage support if needed
SCHULTE SW STA 115 kV	P2-4:A11:8:_TESLA D 230KV - SECTION 1D & 2D	P2	Bus-Tie-Breaker	1.01	1.02	0.97	1.03	1.02	1.03	0.88	0.99	1.02	System adjustments or voltage support if needed
RIPON 115 kV	P2-1:A11:35:_RIPON-MANTECA 115KV [1062] (RPNJ2-MANTECA)	P2	Line Section w/o Fault	1.01	0.96	0.93	1.01	0.99	1.01	0.81	0.90	1.01	Continue to monitor
CLAY 60 kV	P2-3:A11:94:_VLLY SPS 230KV - RING R1 & R4	P2	Non-Bus-Tie Breaker	1.01	1.02	0.85	1.03	1.05	1.05	1.06	1.04	1.01	Continue to monitor
VALLEY HOME 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.01	1.03	0.84	1.04	1.03	1.05	1.00	1.03	1.02	Continue to monitor
CURTIS 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.02	1.04	0.76	1.04	1.04	1.06	1.00	1.02	1.03	Continue to monitor
MI-WUK 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.03	1.04	0.78	1.04	1.05	1.06	1.01	1.03	1.04	Continue to monitor
MELONES SW STA 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.03	1.05	0.75	1.05	1.04	1.06	0.98	1.02	1.04	Continue to monitor
FROGTOWN 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.03	1.05	0.80	1.05	1.05	1.06	1.00	1.04	1.04	Continue to monitor
STOCKTON A 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.04	1.11	0.50	1.04	1.04	1.12	0.95	1.01	1.11	Continue to monitor
LOCKEFORD 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.04	1.11	0.52	1.03	1.04	1.12	0.96	1.01	1.11	Continue to monitor
STANISLAUS PH 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.04	1.06	0.84	1.06	1.06	1.07	1.02	1.05	1.05	Continue to monitor
BELLOTA 115 kV	P2-4:A11:1:_BELLOTA 230KV - SECTION 1E & 2E	P2	Bus-Tie-Breaker	1.04	1.12	0.54	1.03	1.03	1.12	0.95	1.01	1.11	Continue to monitor
HORSESHOE 115 kV	P2-4:A5:5:_GOLDHILL 115KV - SECTION 1F & 1G	P2	Bus-Tie-Breaker	>.95	1.00	0.90	>.95	1.07	1.07	>.95	>.95	1.00	Continue to monitor
CLAY 60 kV	P1-2:A11:10:_VALLEY SPRINGS-BELLOTA 230KV [5860] & P1-1:A11:26:_WESTPOINTPH 11.50KV GEN UNIT 1	P3	G-1 / N-1	>.95	>.95	0.90	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
MERIDIAN 60 kV	P1-1:A4:22:_WADHAM 13.80KV GEN UNIT 1 & P1-1:A4:1:_Q1455SPV 0.60KV GEN UNIT 1	P3	G-1 / N-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
RIPON 115 kV	P1-2:A11:46:_MANTECA-RIPON 115KV [0] & P1-1:A12:13:_STANISLAUSPH 13.80KV GEN UNIT 1	P3	G-1 / N-1	>.95	>.95	0.88	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
VALLEY SPRINGS 230 kV	P1-2:A11:10:_VALLEY SPRINGS-BELLOTA 230KV [5860] & P1-1:A4:23:_WOODLANDBIOM 13.80KV GEN UNIT 1	P3	G-1 / N-1	>.95	>.95	0.87	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions	
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast		
WEIMAR 60 kV	P1-1:A5:28:_ROLLINS 6.60KV GEN UNIT 1 & P1-1:A11:36:_GWFCY3 18.00KV & GWFCY1 13.80KV & GWFCY2 13.80KV GEN UNITS	P3	G-1 / N-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LAMMERS 115 kV	P5-5C:A11:19:_SCHULTE SW STA 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	0.94	0.96	0.88	1.02	1.04	1.05	0.96	1.02	0.97	0.97	Continue to monitor
HIGGINS 115 kV	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	0.94	0.94	0.67	1.05	1.10	1.09	1.02	1.05	0.94	0.94	Continue to monitor
WOODLAND 115 kV	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	0.96	0.99	0.81	1.05	1.09	1.07	1.01	1.05	0.98	0.98	Continue to monitor
ATLANTIC 230 kV	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	0.96	0.97	0.87	1.03	1.02	1.05	1.00	1.02	0.97	0.97	Continue to monitor
BRIGHTON 230 kV	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	0.96	0.97	0.90	1.01	1.02	1.03	1.00	1.01	0.97	0.97	Continue to monitor
DAVIS 115 kV	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	0.97	1.00	0.84	1.05	1.08	1.07	1.02	1.05	1.00	1.00	Continue to monitor
PLEASANT GROVE 115 kV	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	0.98	0.99	0.87	1.04	1.04	1.08	1.02	1.04	0.99	0.99	Continue to monitor
LINCOLN 115 kV	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	0.98	1.00	0.86	1.04	1.05	1.08	1.03	1.04	0.99	0.99	Continue to monitor
ATLANTIC 115 kV	P5-5C:A5:1:_RIO OSO 230-115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant battery supply/Relay	0.98	1.00	0.88	1.05	1.04	1.07	1.02	1.05	0.99	0.99	Continue to monitor
LOCKEFORD 230 kV	P5-5C(DC):A4:2:_STATION DC BATTERY SUPPLY BRIGHTON 230KV BATT	P5	Non-Redundant battery supply/Relay	0.98	0.89	0.97	1.01	0.98	0.97	0.98	1.00	0.89	0.89	Project: Lockeford-Lodi Area 230 kV Development project
HALSEY PH 60 kV	P4-2:A5:2:_STUCK BREAKER & NO BF RELAY GOLD HILL 115KV CB 172 OR 392	P5	Non-Redundant battery supply/Relay	0.99	0.99	0.58	1.03	1.04	1.03	1.02	1.03	0.99	0.99	Continue to monitor
WEST SACRAMENTO 115 kV	P4-2:A5:1:_STUCK BREAKER & NO BF RELAY RIO OSO 115KV CB 402 412 422 432 442 462 OR 472	P5	Non-Redundant battery supply/Relay	1.00	1.03	0.89	1.06	1.08	1.08	1.04	1.06	1.03	1.03	Continue to monitor
RIO OSO 230 kV	P5-5A:A5:2:_RIO OSO 230 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant battery supply/Relay	1.02	1.03	0.87	1.03	1.03	1.03	1.19	1.03	1.03	1.03	Continue to monitor
ATLANTIC 115 kV	P1-2:A5:10:_ATLANTIC-GOLD HILL 230KV [4330] & P1-2:A5:6:_RIO OSO-ATLANTIC 230KV [5590]	P6	N-1-1	>.95	>.95	0.86	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
ATLANTIC 115 kV	P1-2:A5:6:_RIO OSO-ATLANTIC 230KV [5590] & P1-2:A5:10:_ATLANTIC-GOLD HILL 230KV [4330]	P6	N-1-1	>.95	>.95	0.86	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
ATLANTIC 230 kV	P1-2:A5:10:_ATLANTIC-GOLD HILL 230KV [4330] & P1-2:A5:6:_RIO OSO-ATLANTIC 230KV [5590]	P6	N-1-1	>.95	>.95	0.83	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
BELL 115 kV	P1-2:A5:16:_PLACER-GOLD HILL #1 115KV [3340] & P1-2:A5:17:_PLACER-GOLD HILL #2 115KV [4290]	P6	N-1-1	>.95	>.95	0.82	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
BELLOTA 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.56	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
BRIGHTON 115 kV	P1-2:A11:114:_LOCKFORD-BRIGHTON 230KV [0] & P1-2:A4:6:_RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	>.95	>.95	0.85	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
CLAY 60 kV	P1-2:A11:10:_VALLEY SPRINGS-BELLOTA 230KV [5860] & P1-3:A11:11:_VLLY SPS 230/60KV TB 2	P6	N-1-1	>.95	>.95	0.85	>.95	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
CORTINA 230 kV	P1-2:A4:10:_CORTINA-VACA 230KV [4540] & P1-2:A4:2:_DELEVAN-CORTINA 230KV [4384]	P6	N-1-1	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	>.95	>.95	System adjustments or voltage support if needed

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
COUNTRY CLUB 60 kV	P1-2:A11:11:_EIGHT MILE ROAD-STAGG 230KV [5002] & P1-2:A11:9:_STAGG-TESLA 230KV [5680]	P6	N-1-1	>.95	>.95	0.28	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
CURTIS 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.78	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
DAVIS 115 kV	P1-2:A11:114:_LOCKFORD-BRIGHTON 230KV [0] & P1-2:A4:6:_RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	>.95	>.95	0.86	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
EAST MARYSVILLE 115 kV	P1-2:A5:15:_PALERMO-NICOLAUS 115KV [3210] MOAS OPENED ON PALERMO_E.MRY J2 & P1-2:A5:26:_RIO OSO-NICOLAUS 115KV [3440]	P6	N-1-1	>.95	>.95	0.83	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
EAST NICOLAUS 115 kV	P1-2:A5:15:_PALERMO-NICOLAUS 115KV [3210] MOAS OPENED ON PALERMO_E.MRY J2 & P1-2:A5:26:_RIO OSO-NICOLAUS 115KV [3440]	P6	N-1-1	>.95	>.95	0.81	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
FROGTOWN 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.82	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
FROGTOWN 115 kV	P1-3:A11:9:_BELLOTA 230/115KV TB 2 & P1-3:A11:8:_BELLOTA 230/115KV TB 1	P6	N-1-1	>.95	>.95	0.82	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
GRAND ISLAND 115 kV	P1-2:A11:114:_LOCKFORD-BRIGHTON 230KV [0] & P1-2:A4:6:_RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	>.95	>.95	0.84	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
HALSEY PH 60 kV	P1-2:A5:16:_PLACER-GOLD HILL #1 115KV [3340] & P1-2:A5:17:_PLACER-GOLD HILL #2 115KV [4290]	P6	N-1-1	>.95	>.95	0.83	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
HALSEY PH 60 kV	P1-2:A5:17:_PLACER-GOLD HILL #2 115KV [4290] & P1-2:A5:16:_PLACER-GOLD HILL #1 115KV [3340]	P6	N-1-1	>.95	>.95	0.83	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
HAMMER 60 kV	P1-2:A11:11:_EIGHT MILE ROAD-STAGG 230KV [5002] & P1-2:A11:9:_STAGG-TESLA 230KV [5680]	P6	N-1-1	>.95	>.95	0.29	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
HIGGINS 115 kV	P1-2:A5:16:_PLACER-GOLD HILL #1 115KV [3340] & P1-2:A5:17:_PLACER-GOLD HILL #2 115KV [4290]	P6	N-1-1	>.95	>.95	0.86	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LAMMERS 115 kV	P1-2:A11:43:_SCHULTE SW STA-KASSON-MANTECA 115KV [7472] & P1-2:A11:57:_SCHULTE SW STA-LAMMERS 115KV [3993]	P6	N-1-1	>.95	>.95	0.90	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LEPRINO SW STA 115 kV	P1-2:A11:108:_VIERRA-TRACY-KASSON 115KV [4310] (2) & P1-2:A11:52:_TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC	P6	N-1-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LEPRINO SW STA 115 kV	P1-2:A11:52:_TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC & P1-2:A11:108:_VIERRA-TRACY-KASSON 115KV [4310] (2)	P6	N-1-1	>.95	>.95	0.90	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LOCKFORD 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.55	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LODI 60 kV	P1-2:A11:2:_RIO OSO-LOCKFORD 230KV [5620] & P1-2:A11:5:_LOCKFORD-BELLOTA 230KV [4990]	P6	N-1-1	>.95	0.34	>.95	>.95	0.47	0.43	>.95	>.95	0.33	Project: Lockeford-Lodi Area 230 kV Development project
MELONES SW STA 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.77	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
MI-WUK 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.80	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
MOSHER 60 kV	P1-2:A11:11:_EIGHT MILE ROAD-STAGG 230KV [5002] & P1-2:A11:9:_STAGG-TESLA 230KV [5680]	P6	N-1-1	>.95	>.95	0.46	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
PLACER 115 kV	P1-2:A5:16:_PLACER-GOLD HILL #1 115KV [3340] & P1-2:A5:17:_PLACER-GOLD HILL #2 115KV [4290]	P6	N-1-1	>.95	>.95	0.81	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
PLAINFIELD 60 kV	P1-4:A4:17:_PLAINFIELD SVD=V2 & P1-4:A4:18:_PLAINFIELDE SVD=V1	P6	N-1-1	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	0.89	System adjustments or voltage support if needed

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
PLEASANT GROVE 115 kV	P1-2:A5:10:_ATLANTIC-GOLD HILL 230KV [4330] & P1-2:A5:6:_RIO OSO-ATLANTIC 230KV [5590]	P6	N-1-1	>.95	>.95	0.87	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
RIPON 115 kV	P1-2:A11:36:_Q1557-RIPON #1 115KV [0] & P1-2:A11:46:_MANTECA-RIPON 115KV [0]	P6	N-1-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
STANISLAUS PH 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.85	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
STOCKTON A 115 kV	P1-3:A11:8:_BELLOTA 230/115KV TB 1 & P1-3:A11:9:_BELLOTA 230/115KV TB 2	P6	N-1-1	>.95	>.95	0.52	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
SUTTER HOME SWITCHING STATION 60	P1-2:A11:11:_EIGHT MILE ROAD-STAGG 230KV [5002] & P1-2:A11:9:_STAGG-TESLA 230KV [5680]	P6	N-1-1	>.95	>.95	0.25	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
TRACY 115 kV	P1-2:A11:108:_VIERRA-TRACY-KASSON 115KV [4310] (2) & P1-2:A11:52:_TESLA-LEPRINO_JCT 115KV [0] MOAS OPENED ON LEPRINO_JCT_TRACY JC	P6	N-1-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
VALLEY HOME 115 kV	P1-2:A11:46:_MANTECA-RIPON 115KV [0] & P1-2:A11:64:_BELLOTA-RVRBANK-MELONES-TULLOCH 115KV [0]	P6	N-1-1	>.95	>.95	0.90	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
VALLEY SPRINGS 230 kV	P1-2:A4:31:_WOODLAND-DAVIS 115KV [4210] & P1-2:A11:10:_VALLEY SPRINGS-BELLOTA 230KV [5860]	P6	N-1-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
WEIMAR 60 kV	P1-2:A11:107:_VIERRA-TESLA 115KV [0] & P1-3:A5:40:_ROLLINS 60/6.6KV TB 1	P6	N-1-1	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
WEST SACRAMENTO 115 kV	P1-2:A11:114:_LOCKFORD-BRIGHTON 230KV [0] & P1-2:A4:6:_RIO OSO-BRIGHTON 230KV [5600]	P6	N-1-1	>.95	>.95	0.85	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
WOODLAND 115 kV	P1-2:A4:30:_RIO OSO-WOODLAND #1 115KV [3460] & P1-2:A4:32:_RIO OSO-WOODLAND #2 115KV [3470]	P6	N-1-1	>.95	>.95	0.90	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
HIGGINS 115 kV	P7-1:A5:19_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.94	0.95	0.67	1.05	1.10	1.09	1.02	1.05	0.94	Continue to monitor
WEST SACRAMENTO 115 kV	P7-1:A4:17_Rio Oso-West Sacramento 115 kV Line & West Sacramento-Brighton 115 kV Line	P7	DCTL	0.95	0.97	0.89	1.05	1.08	1.06	1.02	1.02	0.96	Continue to monitor
WEIMAR 60 kV	P7-1:A5:19_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.95	0.95	0.86	0.99	1.01	1.02	0.98	0.99	0.95	Continue to monitor
WOODLAND 115 kV	P7-1:A4:16_Rio Oso-Woodland #1 115 kV Line & Rio Oso-Woodland #2 115 kV Line	P7	DCTL	0.99	1.00	0.90	1.05	1.08	1.07	1.02	1.05	1.00	Continue to monitor
HALSEY PH 60 kV	P7-1:A5:19_Placer-Gold Hill No. 1 115 kV Line and Placer-Gold Hill No. 2 115 kV Line	P7	DCTL	0.99	0.99	0.58	1.03	1.03	1.03	1.02	1.03	0.99	Continue to monitor
BRIGHTON 230 kV	P7-1:A11:12:_LOCKEFORD-BELLOTA 230KV #1 [4990] & LOCKEFORD-BELLOTA 230KV #2 [4990]	P7	DCTL	>.95	>.95	0.89	>.95	>.95	>.95	>.95	>.95	>.95	Continue to monitor
LOCKEFORD 230 kV	P7-1:A11:12:_LOCKEFORD-BELLOTA 230KV #1 [4990] & LOCKEFORD-BELLOTA 230KV #2 [4990]	P7	DCTL	>.95	>.95	0.87	>.95	>.95	>.95	>.95	>.95	>.95	Project: Lockeford-Lodi Area 230 kV Development project



Substation	Contingency	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)						Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
LOCKFORD 230 kV	P1-2:A11:5:_LOCKEFORD-BELLOTA 230KV [4990]	P1	N-1	9	<8	<8	<8	<8	<8	<8	<8	<8	Lockeford-Lodi Area 230 kV Development project
GRSS VLY 60 kV	P1-2:A5:60:_COLGATE-GRASS VALLEY 60KV [6490]	P1	N-1	<8	<8	11	<8	<8	<8	<8	<8	<8	Continue to monitor

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2026 Spring Off-Peak	2029 Summer Peak	2034 Summer Peak	2026 OP Sensitivity	2029 SP High CEC Forecast	
P1-1 - Gen HIGHWINDS 0.69 kV unit 1	P1	N-1	NA	No Issue	NA	NA	No Issue	No mitigation required
P1-2 - Line WEBER to TESLA E 230 kV ckt 1	P1	N-1	No Issue	NA	NA	NA	NA	No mitigation required
P1-3 - Tran TESLA 230/115 kV bk 3	P1	N-1	No Issue	NA	NA	NA	NA	No mitigation required
P1-3 - Tran TESLA 500/230 kV bk 2	P1	N-1	NA	NA	No Issue	No Issue	No Issue	No mitigation required
P1-3 - Tran VACA-DIX 230-115 kV bk 4	P1	N-1	NA	No Issue	NA	NA	NA	No mitigation required
P1-4 - RIO OSO 230 kV SVC id v	P1	N-1	NA	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	NA	Potential WECC/NERC criteria violation	Project: Gold Hill-El Dorado Reinforcement Project
P2-1 - Line GOLDHILL to RALSTON 230 kV ckt 1	P2	Bus/Breaker	NA	No Issue	NA	No Issue	No Issue	No mitigation required
P2-1 - Line SANDHLWJCT to TESLA D 230 kV ckt 1	P2	Bus/Breaker	No Issue	No Issue	NA	NA	NA	No mitigation required
P2-1 - Line SCHULTE to GWFRACY 115 kV ckt 1	P2	Bus/Breaker	NA	No Issue	No Issue	NA	NA	No mitigation required
P2-2 - Bus Fault at BELLOTA 230 kV Bus 1E	P2	Bus/Breaker	No Issue	NA	NA	No Issue	No Issue	No mitigation required
P2-2 - Bus Fault at TESLA D 230 kV Section 2D	P2	Bus/Breaker	NA	No Issue	NA	NA	NA	No mitigation required
P2-2 - Bus Fault at VACA-DIX 230 kV Bus 1F	P2	Bus/Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P2-3 - Internal fault at non-Bus-tie Breaker 312 at TESLA D 230 kV	P2	Bus/Breaker	NA	No Issue	No Issue	NA	NA	No mitigation required
P2-4 - Internal fault at Bus-tie Breaker 400 at BELLOTA 230 kV	P2	Bus/Breaker	No Issue	No Issue	NA	No Issue	No Issue	No mitigation required
P2-4 - Internal fault at Bus-tie Breaker 612 at VACA-DIX 230 kV	P2	Bus/Breaker	NA	NA	Potential WECC/NERC criteria violation	NA	NA	Continue to Monitor
P3-1 - Gen HIGHWINDS 0.69 kV unit 1 and SHILOH 0.6 kV unit 1	P3	G-1/N-1	NA	NA	NA	No Issue	No Issue	No mitigation required
P3-1 - Gen STANISLS 13.8 kV unit 1 and RALSTON 13.8 kV unit 1	P3	G-1/N-1	No Issue	NA	NA	NA	NA	No mitigation required
P3-1 - Gens GWFRACY (3 units) and COLGATE1 13.8 kV unit 1	P3	G-1/N-1	NA	No Issue	No Issue	NA	NA	No mitigation required
P3-2 - Gen GWFRACY (3 units) and Line GOLDHILL to RALSTON 230 kV ckt 1	P3	G-1/N-1	NA	No Issue	No Issue	NA	NA	No mitigation required
P3-2 - Gen HIGHWINDS 0.69 kV unit 1 and Line GOLDHILL to RALSTON 230 kV ckt 1	P3	G-1/N-1	NA	NA	NA	No Issue	Potential WECC/NERC criteria violation	Sensitivity only
P3-2 - Gen STANISLS 13.8 kV unit 1 and Line WEBER to TESLA E 230 kV ckt 1	P3	G-1/N-1	No Issue	NA	NA	NA	NA	No mitigation required
P3-3 - Gen GWFRACY (3 units) and Tran TESLA 500-230 kV bk 2	P3	G-1/N-1	NA	No Issue	No Issue	NA	NA	No mitigation required
P3-3 - Gen HIGHWINDS 0.69 kV unit 1 and Tran TESLA 500/230 kV bk 2	P3	G-1/N-1	NA	NA	NA	No Issue	No Issue	No mitigation required
P3-3 - Gen STANISLS 13.8 kV unit 1 and Tran TESLA 230/115 kV bk 3	P3	G-1/N-1	No Issue	NA	NA	NA	NA	No mitigation required
P3-4 - Gen GWFRACY (3 units) and RIO OSO 230 kV SVC id v	P3	G-1/N-1	NA	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	NA	NA	Project: Gold Hill-El Dorado Reinforcement Project
P3-4 - Gen HIGHWINDS 0.69 kV unit 1 and RIO OSO 230 kV SVC id v	P3	G-1/N-1	NA	NA	NA	No Issue	Potential WECC/NERC criteria violation	Sensitivity only
P4-1 - Stuck 115 kV Breaker 162 protecting Gen STANISLS 13.8 kV unit 1	P4	Stuck Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P4-2 - Stuck breaker Tesla CB 2512 protecting Line TESLA C to NEWARK E 230 kV ckt 2	P4	Stuck Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P4-3 - Stuck breaker Tesla CB 2422 protecting Tran Tesla 500-230 kV bk 6	P4	Stuck Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2026 Spring Off-Peak	2029 Summer Peak	2034 Summer Peak	2026 OP Sensitivity	2029 SP High CEC Forecast	
P4-4 - Stuck Breaker 492 protecting SVD VACA-DIX 230 kV id v	P4	Stuck Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P4-5 - Stuck non-Bus-tie Breaker 312 protecting Substation Bus TESLA D 230 kV Section 1D	P4	Stuck Breaker	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P4-6 - Stuck Bus-tie Breaker 102 protecting Substation Bus TESLA 115 kV	P4	Stuck Breaker	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Project: Tesla 115 kV Bus Reconfiguration Project
P5-1 - Failure of non-redundant relay on Colgate CB 262 protecting Gen COLGATE1 13.8 kV unit 1	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-1d - Failure of Colgate 230 kV CB 262 control circuits due to non-redundant DC panel with fault for Gen COLGATE1 13.8 kV unit 1 (ALL 230 kV clears remotely)	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-2d - Failure of Stanislaus PH 115 kV CB 112 non-redundant DC CB control circuit (with no Breaker Fail relay) for Line STANISLS to FRGTNTP1 115 kV ckt 1 (ALL 115 kV clears remotely)	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-2d - Failure of Vaca-Dixon 230 Kv non-redundant DC CB control circuit	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	Potential WECC/NERC criteria violation	No Issue	No Issue	Continue to Monitor
P5-2d - Failure of Woodland 115 Kv non-redundant DC CB control circuit	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-3d - Failure of Rio Oso 230 kV CB 272 control circuits due to non-redundant DC panel with fault for Tran RIO OSO 230/115 kV bk 1 (ALL 230 kV clears remotely)	P5	Non-Redundant battery supply/Relay	No Issue	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Add Redundant relay
P5-4 - Failure of non-redundant relay protecting RIO OSO 230 kV SVC id v	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-4d - Failure of Gold Hill 115 kV CB 392 control circuits due to non-redundant DC panel with fault for SVD GOLDHILL 115 kV SVC id v (ALL 115 kV clears remotely)	P5	Non-Redundant battery supply/Relay	Potential WECC/NERC criteria violation	No Issue	No Issue	No Issue	No Issue	Add Redundant relay
P5-5c - Failure of non-redundant relay DC Supply protecting Substation Bus BELLOTA 230 kV	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P5-5c - Failure of non-redundant relay DC Supply protecting Substation Bus STAGG 230 kV	P5	Non-Redundant battery supply/Relay	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P6-3 - Fault on Line BRIGHTON to BELLOTA 230 kV ckt 1 with Loss of RIO OSO 230 kV SVC id v	P6	N-1-1	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P6-2 - Fault on Tran BELLOTA 230-115 kV bk 1 with Loss of Tran BELLOTA 230-115 kV bk 2 with RAS	P6	N-1-1	NA	No Issue	No Issue	NA	No Issue	No mitigation required
P6-2 - Fault on Tran BELLOTA 230-115 kV bk 1 with Loss of Tran BELLOTA 230-115 kV bk 2	P6	N-1-1	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P6-1 - Fault on Line Rio Oso to Lockeford 230 kV ckt 1 with Loss of Line Lockeford - Bellota 230 kV ckt 1	P6	N-1-1	No Issue	Potential WECC/NERC criteria violation	No Issue	No Issue	Potential WECC/NERC criteria violation	Project: Lockeford – Lodi Area 230 kV Development
P7-1_RS - Fault on Line RIO OSO* to BRIGHTON 230 kV Line ckt 1 and Line RIO OSO* to LOCKFORD 230 kV ckt 1 (HSR Success)	P7	DCTL	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P7-1_RF - Fault on Line RIO OSO* to BRIGHTON 230 kV Line ckt 1 and Line RIO OSO* to LOCKFORD 230 kV ckt 1 (HSR Failure)	P7	DCTL	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P7-1 - Line RIO OSO to W.SCRMNO 115 kV Line ckt 1 with Line W.SCRMNO to BRIGHTON 115 kV ckt 1 RS	P7	DCTL	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required
P7-1 - Line RIO OSO to W.SCRMNO 115 kV Line ckt 1 with Line W.SCRMNO to BRIGHTON 115 kV ckt 1 RF	P7	DCTL	No Issue	No Issue	No Issue	No Issue	No Issue	No mitigation required

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)									Potential Mitigation Solutions
			2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	

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

Substation	Load Served (MW)										Potential Mitigation Solutions
	2026 Summer Peak	2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	

No single source substation with more than 100 MW