2026-2027 ISO Reliability Assessment - Study Results
Study Area: PG&E Kern
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2036 Summer-Off Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
Kern PP-Westpark #1 115kV line	P1-2:A15:39:_KERN-WESTPARK #2 115KV [2010]+P1-2:A15:49:_KERN-MAGUNDEN-WITCO 115KV [1970]	P6	N-1-1	101	108	111	<100	<100	<100	<100	<100	113	Mitigation Under Development
Kern-Magunden-Witco 115kV line	P2-1:A15:124:_WESTPARK_TAP-BEAR TAP 115KV [0] NO FAULT	P2	Bus/Breaker	<100	<100	<100	<100	<100	132	<100	<100	<100	Sensitivity Only
	P7-1:A15:7_Kern PP-Westpark No. 1 & 2 115 kV Lines	P7	DCTL	104	110	112	<100	<100	<100	<100	<100	116	Mitigation Under Development
	P1-2:A15:53:_KERN-MAGUNDEN-WITCO 115KV [1970] + P1-1:A15:94:_MAGUNDEN1-25_25.00KV GEN UNIT VS	P3	G-1/N-1	<100	<100	101	<100	<100	<100	<100	<100	<100	Continue to monitor
	P1-2:A15:38:_KERN-WESTPARK #1 115KV [2000]+P1-2:A15:39:_KERN-WESTPARK #2 115KV [2010]	P6	N-1-1	104	110	112	<100	<100	<100	<100	<100	116	Mitigation Under Development
Midway-Tupman-Rio Bravo-Renfro 115kV line	P2-4:A15:9:_MIDWAY 115KV - Section 2E & 1E	P2	Bus/Breaker	125	129	<100	<100	<100	<100	<100	<100	132	Project: Midway Bus Upgrade
Fellows-Taft 115kV line	P2-4:A15:7:_MIDWAY 115KV - Section 2D & 2E	P2	Bus/Breaker	<100	<100	<100	<100	<100	<100	103	<100	<100	Sensitivity Only
Fellows-Midsun 115kV line	P2-4:A15:7:_MIDWAY 115KV - Section 2D & 2E	P2	Bus/Breaker	<100	<100	<100	<100	<100	<100	103	<100	<100	Sensitivity Only
Taft-Maricopa 70kV line	P2-4:A15:10:_MIDWAY 115KV - Section 2D & 1D	P2	Bus/Breaker	144	148	<100	<100	178	<100	175	<100	146	Project: Midway Bus Upgrade
Taft-Elk Hills 70kV line	P2-4:A15:10:_MIDWAY 115KV - Section 2D & 1D	P2	Bus/Breaker	125	128	<100	<100	163	<100	164	<100	126	Project: Midway Bus Upgrade
Taft-Maricopa 70kV line	P2-4:A15:10:_MIDWAY 115KV - Section 2D & 1D	P2	Bus/Breaker	125	128	<100	<100	163	<100	164	<100	126	Project: Midway Bus Upgrade
Copus-Lakeview 70kV line	P2-4:A15:10:_MIDWAY 115KV - Section 2D & 1D	P2	Bus/Breaker	125	128	<100	<100	163	<100	164	<100	126	Project: Midway Bus Upgrade
San Bernard-Weedpatch 70kV line	P1-1:A15:57:_KERNCANYONPH 11.00KV GEN UNIT 1 +	P3	G-1/N-1	106	<100	100	<100	<100	<100	<100	<100	101	Mitigation Under Development
	P1-2:A15:7:_BITTERWATRSS-WHEELER 230KV [0]+P1-2:A15:30:_MIDWAY-WHEELER RIDGE #1 230KV [5190]	P6	N-1-1	334	<100	127	<100	117	<100	<100	<100	<100	Mitigation Under Development
	P7-1:A15:20:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P7	DCTL	325	<100	<100	<100	104	<100	<100	<100	<100	Project: Tejon Area Reinforcement
Weedpatch-Magunden 70kV line	P1-2:A15:7:_BITTERWATRSS-WHEELER 230KV [0]+P1-2:A15:30:_MIDWAY-WHEELER RIDGE #1 230KV [5190]	P6	N-1-1	195	183	Nconv	<100	<100	<100	<100	<100	<100	Mitigation Under Development
Semitropic-Famoso 115kV line	P1-2:A15:49:_LERDO-KERN OIL-7TH STANDARD 115KV + P1-1:A15:65:_MT POSO 13.80KV GEN UNIT 1	P3	G-1/N-1	113	117	123	121	<100	<100	<100	<100	129	Mitigation Under Development
	P2-2:A15:36:_MIDWAY 115KV Section 2E	P2	Bus/Breaker	104	<100	<100	<100	<100	<100	<100	<100	<100	Project: Midway Bus Upgrade
	P2-4:A15:11:_MIDWAY 115KV - Section 2E & 1E	P2	Bus/Breaker	104	<100	<100	<100	<100	<100	<100	<100	<100	Project: Midway Bus Upgrade
	P2-4:A15:7:_MIDWAY 115KV - Section 2D & 2E	P2	Bus/Breaker	104	<100	<100	<100	<100	<100	<100	<100	<100	Project: Midway Bus Upgrade
Famoso-Lerdo 115kV line	P2-2:A15:38:_MIDWAY 115KV SECTION 2E	P2	Bus/Breaker	128	121	<100	103	<100	<100	<100	<100	123	Project: Midway Bus Upgrade
Lerdo-Kern Oil-7th Standard 115kV line	P1-2:A15:41:_SEMITROPIC_D-CHARKA-WSCOPRSN 115KV [0] + P1-1:A15:65:_MT POSO 13.80KV GEN UNIT 1	P3	G-1/N-1	106	118	124	<100	<100	<100	<100	120		Mitigation Under Development
	P1-2:A15:125:_SMYRNA-SEMITROPIC-MIDWAY 115KV [3710] + P1-2:A15:58:_SEMITROPIC-MIDWAY #1 115KV [3630]	P6	N-1-1	<100	110	122	<100	<100	110	<100	<100	113	Mitigation Under Development
	P7-1:A15:6:_Kern PP-Westpark No. 1 & 2 115 KV Lines	P7	DCTL	104	110	112	<100	<100	<100	<100	<100	116	Mitigation Under Development
Kern-Stockdale-Lamont 115kV line	P1-2:A15:57:_STOCKDLE-LAMONT-KERN PP-TEVIS 115KV [0]	P1	N-1	116	114	<100	<100	<100	<100	<100	<100	<100	Project: Wheeler Ridge Junction
	P1-1:A15:47:_REGULUS 0.38KV GEN UNIT 1 + P1-2:A15:57:_STOCKDLE-LAMONT-KERN PP-TEVIS 115KV [0]	P3	G-1/N-1	<100	104	101	<100	<100	<100	<100	<100	104	Mitigation Under Development
San Luis Obispo-Carrizo 115kV line	P2-1:A15:105:_MIDWAY-TEMBLOR 115KV [2630] (TEMBLOR-PSE MCKJ)	P2	Bus/Breaker	<100	<100	126	<100	<100	<100	<100	<100	<100	Continue to Monitor
Midway-Wheeler Ridge #1 230kV line	P1-2:A15:119:_WHEELER-CASALOMA #1 230KV + P1-2:A15:114:_BITTERWATRSS-MIDWAY-D 230KV	P6	N-1-1	180	162	150							Mitigation Under Development
	P1-3:A15:37:_Q1397-Q1398 230/34.5KV TB 1	P1	N-1	131	163	110							Mitigation Under Development
Midway-Gates 230kV line	P1-2:A15:6:_Q1593SWSTA-MIDWAY-F #1 230KV [0]	P1	N-1	125	131	128	<100	<100	<100	<100	<100	141	Mitigation Under Development
	P7-1:A15:22:_DRY LAKE-MIDWAY-F #1 230KV [0]& ARCO-MIDWAY 230KV [4320]	P7	DCTL	125	131	129	<100	<100	<100	<100	<100	141	Mitigation Under Development

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2031 Spring Off-Peak	2028 Spring Off-Peak	2036 Summer-Off Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
Kern Ridge 115kV	P1-2:A15:124:_MIDWAY D-TEMBLOR-PUMPJACK 115KV [0]	P1	N-1-1	>0.9	>0.9	0.60	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor
	P2-1:A15:105:_MIDWAY-TEMBLOR 115KV [2630] (TEMBLOR-PSE MCKJ)	P2	G-1/N-1	>0.9	>0.9	0.59	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor
	P7-1:A15:6:_MIDSUN-MIDWAY & MIDWAY-TEMBLOR 115 KV LINES	P7	DCRT	0.88	0.88	0.88	0.88	0.88	0.88	0.88	>0.9	0.88	Mitigation Under Development
Temblor 115kV	P1-2:A15:124:_MIDWAY D-TEMBLOR-PUMPJACK 115KV [0]	P1	N-1-1	>0.9	>0.9	0.61	>0.9	>0.9	1.04	>0.9	>0.9	>0.9	Continue to monitor
	P2-1:A15:105:_MIDWAY-TEMBLOR 115KV [2630] (TEMBLOR-PSE MCKJ)	P2	G-1/N-1	>0.9	>0.9	>0.9	0.61	>0.9	>0.9	>0.9	>0.9	>0.9	Off-peak only
	P2-1:A15:105:_MIDWAY-TEMBLOR 115KV [2630] (TEMBLOR-PSE MCKJ)	P2	Bus/Breaker	>0.9	>0.9	0.59	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	Continue to monitor
MAGUNDEN 70kV	P7-1:A15:20:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P7	DCRT	>0.9	>0.9	0.61	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	Project: Tejon Area Reinforcement
	2:A15:34:_MIDWAY-WHEELER RIDGE #1 230KV [5190]	P6	N-1-1	0.78	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	
BAKRSFLD 70kV	P7-1:A15:20:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P7	DCRT	0.88	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	Mitigation under development
	BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P6	N-1-1	0.87	0.87	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	Mitigation Under Development
WEEDPTCH 70kV	P7-1:A15:20:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P7	DCRT	>0.9	0.84	>0.9	>0.9	>0.9	>0.9	0.88	>0.9	>0.9	Project: Tejon Area Reinforcement
WHEELER RIDGE 230kV	P7-1:A15:19:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-WHEELER 230KV [0]	P7	DCRT	0.85	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	>0.9	>0.9	Project: Wheeler Ridge Junction
	P7-1:A15:20:_MIDWAY-WHEELER RIDGE #1 230KV [5190]& BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P7	N-1-1	0.88	>0.9	>0.9	>0.9	0.86	>0.9	0.86	>0.9	>0.9	
WHEELER RIDGE 115kV	P1-3:A15:13:_WHEELER 230/70KV TB 4 + P1-3:A15:14:_WHEELER 230/70KV TB 5	P6	N-1-1	>0.9	>0.9	>0.9	0.59	>0.9	>0.9	0.85	>0.9	>0.9	Sensitivity Only
AEVICTORY 115kV	P1-2:A15:70:_MIDWAY-TAFT 115KV [2620] + P1-2:A15:71:_MIDSUN-MIDWAY 115KV [2580]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	Sensitivity Only
MIDSUN 115kV	P1-2:A15:70:_MIDWAY-TAFT 115KV [2620] + P1-2:A15:71:_MIDSUN-MIDWAY 115KV [2580]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	0.82	>0.9	>0.9	>0.9	Sensitivity Only
FELLOWSG 115kV	P1-2:A15:70:_MIDWAY-TAFT 115KV [2620] + P1-2:A15:71:_MIDSUN-MIDWAY 115KV [2580]	P6	N-1-1	>0.9	>0.9	>0.9	>0.9	>0.9	0.83	>0.9	>0.9	>0.9	Sensitivity Only

Substation	Contingency	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)						Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2036 Summer-Off Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
TEMBLOR 115.0 kV	MIDWAY D-TEMBLOR-PUMPJACK 115KV	P1	N-1	NA	NA	41.68	NA	NA	< 8	NA	NA	NA	Continue to monitor

Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios				Sensitivity Scenarios		
			2028 Spring Off-Peak	2031 Summer Peak	2036 Summer Peak	2036 Summer-Off Peak	2028 Spring OP Sensitivity	2031 SP High CEC Forecast	
P5-5a - Failure of non-redundant relay protecting Substation Bus Westpark 115 kV (ALL 115kV elements clear remotely)	P5	Non-Redundant Battery/Relay	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	No issues	Install redundant relay
P2-4 - Internal fault at Bus-tie Breaker 302 at MIDWAY 115 kV Bus 1D	P2	Bus/Breaker	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	No issues	Project: Midway Bus Upgrade
P2-4 - Internal fault at Bus-tie Breaker 392 at MIDWAY 115 kV Bus E	P2	Bus/Breaker	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	Project: Midway Bus Upgrade
P5-5a - Failure of non-redundant relay protecting Substation Bus Westpark 115 kV (ALL 115kV elements clear remotely)	P5	Non-Redundant Battery/Relay	No issues	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	Install redundant relay
P5-5c - Failure of non-redundant DC battery supplying Kern Oil Sub 115kV Buses for SLG fault at Kern Oil Sub 115kV Bus Sec D (All 115 kV elements clear remotely)	P5	Non-Redundant Battery/Relay	No issues	No issues	No issues	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Sensitivity only
P5-2d - Failure of Corcoran 115 kV CB 122 non-redundant DC CB control circuit (with no Breaker Fail relay) for Line CORCORAN to FRSHWTRJCT 115 kV ckt 1 (ALL 115 kV clears remotely)	P5	Non-Redundant Battery/Relay	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	Install redundant battery supply
P7-1 - Fault on Line Midway*-Wheeler Ridge #1 230 kV ckt 1 and Line Midway*-Wheeler Ridge 230 kV ckt 2	P7	DCTL	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	No issues	Mitigation Under Development

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)									Potential Mitigation Solutions
			2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2036 Summer-Off Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 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	2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2036 Summer-Off Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	

No single source substation with more than 100 MW