



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
34774 MIDWAY 115 34776 TAFT 115 1 1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	11	NConv	9	54	55	6	NConv	Install redundant relay
34777 FELLOWSG 115 39070 AEVICTORYJT 115 1 1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	22	NConv	9	55	55	9	NConv	Install redundant relay
34903 PANMJCT1 70.0 34914 KERN PW1 70.0 1 1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	4	3	3	4	NConv	Install redundant relay
34975 OLD_RVR1_TP 70.0 34903 PANMJCT1 70.0 1 1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	4	3	3	4	NConv	Install redundant relay
39070 AEVICTORYJT 115 34779 MIDSUN 115 1 1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	0	NConv	7	36	37	7	NConv	Install redundant relay
Arco-Cholame 70 kV Line	Base Case	P0	Basecase	30	24	101	26	18	21	26	25	Generation Redispatch
Arco-Midway 230 kV Line	P5-5C(DC):A15:1:_MIDWAY 500KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	8	NConv	NConv	NConv	NConv	NConv	NConv	11	Install redundant battery supply
Arco-Tulare Lake 70 kV Line	Base Case	P0	Basecase	94	94	96	73	102	76	74	93	Under Review: System reconfiguration
	Base Case	P0	Basecase	100	101	103	79	108	83	80	100	Under Review: System reconfiguration
Blackwell-Q484TP 70 kV line	Base Case	P0	Basecase	33	40	32	15	82	100	15	40	Sensitivity Only
CHARKA-FAMOSO 115 kV	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	42	43	44	42	27	33	42	136	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	42	43	44	42	27	33	42	136	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	43	NConv	85	92	89	86	NConv	Install redundant battery supply
Copus-Old River 70 kV Line	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	259	<100	257	77	50	58	78	156	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	259	<100	257	77	50	58	78	156	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	84	29	21	84	NConv	Install redundant battery supply
Fellows-Taft 115 kV Line	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	24	NConv	12	59	57	12	NConv	Install redundant battery supply
Gates-Arco 230kV	P5-5C(DC):A15:1:_MIDWAY 500KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	NConv	NConv	NConv	NConv	NConv	NConv	30	Install redundant battery supply
Gates-Midway 230kV	P5-5C(DC):A15:1:_MIDWAY 500KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	NConv	NConv	NConv	NConv	NConv	NConv	11	Install redundant battery supply
Kern Canyon-Magunden-Weedpatch 70 kV Line	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0]	P1	N-1	<100	25	30	<100	15	<100	<100	115	Sensitivity Only
	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	19	25	30	26	19	26	26	101	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	19	25	30	26	19	26	26	101	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	25	NConv	33	114	112	32	NConv	Install redundant battery supply
	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	<100	<100	<100	166	97	202	167	290	Install redundant battery supply
Kern-Kern Oil-Famoso 70 kV Line	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	57	83	93	58	NConv	Install redundant battery supply
Kern-Lamont 115 kV Line	P2-1:A15:75:_KERN-STOCKDALE-LAMONT #1 (21KV) 115KV [1990] (KERN PWR-TEVISJ1)	P2	Line Section w/o Fault	<100	94	101	<100	58	<100	<100	95	Project: Lamont BESS
Kern-Live Oak 115 kV Line	KERN OIL-WITCO 115KV [1920] & 7TH STANDARD-KERN 115KV [1981]	P6	N-1-1	93	113	<100	<100	<100	<100	<100	106	Project: Kern PP 115 kV Area Reinforcement
Kern-Magunden 70 kV Line	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	32	85	75	32	NConv	Install redundant battery supply
	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	19	19	19	125	75	136	125	202	Install redundant battery supply
	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	NA	NA	NA	57	6	43	57	151	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NA	NA	NA	57	6	43	57	151	Install redundant battery supply
	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NA	NA	NA	139	81	153	140	236	Install redundant battery supply
Kern-Stockdale 115 kV Line	P2-1:A15:76:_KERN-STOCKDALE-LAMONT #2 115KV [1940] (KERN PWR-TEVISJ2)	P2	Line Section w/o Fault	<100	93	100	<100	50	<100	<100	94	Project: Lamont BESS
Lerdo-Famoso 115 kV Line	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	<100	<100	<100	59	41	32	59	130	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	<100	<100	<100	59	41	32	59	130	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	102	111	113	102	NConv	Install redundant battery supply
Lerdo-Kern Oil-7th Standard 115 kV Line	P1-1:A15:37:_MT POSO 13.80KV GEN UNIT 1 & P1-2:A15:37:_7TH STANDARD-KERN 115KV [1981]	P3	G-1/N-1	111	120	116	<100	<100	<100	<100	116	Mitigation under review
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	80	94	106	80	NConv	Install redundant battery supply
	OGLE TAP 115/13.8KV TB 1 & 7TH STANDARD-KERN 115KV [1981]	P6	N-1-1	98	108	104	<100	<100	<100	<100	109	Line Capacity Increase
Live Oak-Kern Oil 115 kV Line	Base Case	P0	Basecase	97	103	95	78	84	97	78	103	Rating under review
	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundant Battery	<100	<100	<100	78	75	97	78	107	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	<100	<100	<100	78	75	97	78	107	Install redundant battery supply

Study Area: **PG&E Kern**
Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
	KERN OIL-WITCO 115KV [1920] & 7TH STANDARD-KERN 115KV [1981]	P6	N-1-1	94	107	<100	<100	<100	<100	<100	102	Project: Kern PP 115 kV Area Reinforcement
Maricopa-Copus 70 kV Line	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	275	21	280	93	43	35	94	175	Install redundant battery supply
	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	275	21	280	93	43	35	94	175	Install redundant battery supply
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	21	NConv	99	121	112	99	NConv	Install redundant battery supply
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	20	NConv	13	44	47	14	NConv	Install redundant battery supply
Midsun-Midway 115 kV Line	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	20	NConv	13	44	47	14	NConv	Install redundant battery supply
Midway 230/115 kV Transformer #2	P2-4:A15:17:_ MIDWAY 115KV - SECTION 1E & 1D	P2	Bus-Tie-Breaker	Mon Branch Invalid	100	93	Mon Branch Invalid	32	Mon Branch Invalid	Mon Branch Invalid	89	Mitigation under review
Midway 230/115 kV Transformer #3	P2-3:A15:20:_ MIDWAY-DDBSB - 2D 230KV & MIDWAY-DDBSB-MIDWAY-R12 #1 LINE	P2	Non-Bus-Tie Breaker	108	NA	NA	78	NA	102	52	NA	Mitigation under review
	P2-4:A15:16:_ MIDWAY 115KV - SECTION 2D & 1D	P2	Bus-Tie-Breaker	<100	102	109	<100	11	<100	<100	92	Mitigation under review
Midway-Kern #4 230 kV Line	MIDWAY-KERN #3 230KV [5160] & KERN PP-MIDWAY-F 230KV [0]	P6	N-1-1	113	<100	<100	<100	<100	<100	<100	<100	Project: Midway-Kern PP 230 kV #2 Line Project
	P7-1:A15:12:_ MIDWAY-KERN NO. 3 & MIDWAY-KERN NO. 1 230 KV LINES	P7	DCTL	113	NA	NA	55	NA	33	55	NA	Project: Midway-Kern PP 230 kV #2 Line Project
Midway-Kern 230kV Line No 3	P2-4:A15:21:_ MIDWAY-DDBSB SECTION 2D & MIDWAY-E SECTION 2E 230KV	P2	Bus-Tie-Breaker	94	<100	<100	222	<100	17	24	<100	Project: Midway-Kern PP 230 kV #2 Line Project
	P2-4:A15:22:_ MIDWAY-DDBSB SECTION 1D & MIDWAY-E SECTION 1E 230KV	P2	Bus-Tie-Breaker	41	<100	<100	100	<100	14	24	<100	Project: Midway-Kern PP 230 kV #2 Line Project
Midway-Shafter 115 kV Line	P1-2:A15:50:_ MIDWAY-RENFRO-TUPMAN 115KV [2590]	P1	N-1	<100	101	103	<100	51	<100	<100	102	Line Capacity Increase
	P1-2:A15:55:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600]	P1	N-1	134	139	143	55	91	90	55	140	Line Capacity Increase
	P2-1:A15:76:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600] (TPMNTP2-RENF RJCT)	P2	Line Section w/o Fault	159	165	173	71	103	78	71	167	Line Capacity Increase
	P2-1:A15:95:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600] (RENF RJCT-RIO BRVO)	P2	Line Section w/o Fault	133	139	143	55	91	90	55	140	Line Capacity Increase
	P2-3:A15:51:_ TUPMAN - 1E 115KV & MIDWAY-TUPMAN-RIO BRAVO-RENFRO LINE	P2	Non-Bus-Tie Breaker	133	139	142	55	91	90	55	140	Line Capacity Increase
	P2-3:A15:66:_ RENFRO2 - 1F 115KV & MIDWAY-TUPMAN-RIO BRAVO-RENFRO LINE	P2	Non-Bus-Tie Breaker	134	139	143	55	91	90	55	140	Line Capacity Increase
	P2-3:A15:70:_ MIDWAY - 1E 115KV & MIDWAY-TUPMAN-RIO BRAVO-RENFRO LINE	P2	Non-Bus-Tie Breaker	134	140	144	55	91	91	55	141	Line Capacity Increase
	P1-1:A15:48:_ PSE-BEAR 13.80KV GEN UNIT 1 & P1-2:A15:52:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600]	P3	G-1/N-1	134	139	143	<100	<100	<100	<100	140	Line Capacity Increase
	P1-1:A15:8:_ Q744P5G5 0.60KV GEN UNIT 5 & P1-2:A15:55:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600]	P3	G-1/N-1	134	<100	<100	<100	<100	<100	<100	<100	Line Capacity Increase
	P5-5A(NRDR):A15:15:_ TUPMAN 115KV BUS 1D (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	133	138	142	55	91	90	55	139	Install redundant battery supply
	P5-5A(NRDR):A15:7:_ RENFRO 115KV (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	133	138	142	55	91	90	55	139	Install redundant battery supply
	P5-5C(DC):A15:25:_ TUPMAN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	133	138	142	55	91	90	55	139	Install redundant battery supply
	P5-5C(DC):A15:31:_ RENFRO 115KV BATT BATT #1(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	99	101	103	44	51	53	44	102	Install redundant battery supply
	P5-5C(DC):A15:34:_ RENFRO 115KV BATT BATT #2(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	134	139	143	55	91	90	55	140	Install redundant battery supply
	P7-1:A15:7:_ MIDWAY-TUPMAN-RENFRO & MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115 KV LINES	P7	DCTL	133	138	142	55	91	90	55	139	Line Capacity Increase
Midway-Tupman-Renfro 115 kV Line	P2-1:A15:92:_ MIDWAY-TUPMAN-RIO BRAVO-RENFRO 115KV [2600] (MIDWAY-RIOBRVTM)	P2	Line Section w/o Fault	<100	100	104	<100	49	<100	<100	101	Line Capacity Increase
	P2-2:A15:46:_ MIDWAY 115KV SECTION 1E	P2	Bus	99	101	105	41	49	63	42	101	Line Capacity Increase
	P2-4:A15:12:_ MIDWAY 115KV - SECTION 2E & 1E	P2	Bus-Tie-Breaker	194	198	208	80	89	112	80	201	Line Capacity Increase
	P2-4:A15:17:_ MIDWAY 115KV - SECTION 1E & 1D	P2	Bus-Tie-Breaker	<100	101	106	<100	49	<100	<100	102	Line Capacity Increase
Midway-Tupman-Rio Bravo-Renfro 115 kV Line	P1-2:A15:61:_ MIDWAY-SHAFTER 115KV [2610]	P1	N-1	131	136	139	54	91	89	54	137	Line Capacity Increase
	P2-2:A15:44:_ MIDWAY 115KV SECTION 2E	P2	Bus	131	135	138	54	90	89	54	138	Line Capacity Increase
	P2-3:A15:125:_ SHAFTER 115KV - RING R4 & R3	P2	Non-Bus-Tie Breaker	106	110	115	44	75	76	44	111	Line Capacity Increase
	P2-3:A15:67:_ MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	131	135	138	54	90	89	54	137	Line Capacity Increase
	P2-4:A15:12:_ MIDWAY 115KV - SECTION 2E & 1E	P2	Bus-Tie-Breaker	133	138	146	62	75	68	63	140	Line Capacity Increase
	P2-4:A15:14:_ MIDWAY 115KV - SECTION 2E & 2D	P2	Bus-Tie-Breaker	136	141	144	54	89	90	55	144	Line Capacity Increase
	P2-4:A15:15:_ MIDWAY 115KV - SECTION 2E & 1E	P2	Bus-Tie-Breaker	140	146	151	55	88	92	55	148	Line Capacity Increase

Study Area: **PG&E Kern**
Thermal Overloads



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				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
	P1-1:A15:42:_FRITOLAY 9.11KV GEN UNIT 1 & P1-2:A15:58:_MIDWAY-SHAFTER 115KV [2610]	P3	G-1/N-1	<100	136	139	<100	<100	<100	<100	<100	Line Capacity Increase
	MIDWAY-SHAFTER 115KV [2610] & MIDWAY-RENFRO-TUPMAN 115KV [2590]	P6	N-1-1	98	100	104	<100	<100	<100	<100	101	Line Capacity Increase
Midway-Wheeler Ridge #1 230 kV Line	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0]	P1	N-1	NA	129	118	NA	9	NA	NA	118	Review Project: Wheeler Ridge Junction
	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0]	P1	N-1	129	NA	NA	98	NA	15	99	NA	Review Project: Wheeler Ridge Junction
	P2-1:A15:1:_BITTERWATRSS-WHLR RJ2 230KV [0] NO FAULT	P2	Line Section w/o Fault	127	128	117	97	26	29	97	118	Review Project: Wheeler Ridge Junction
	P2-1:A15:16:_MIDWAY-WHEELER RIDGE #2 230KV [5200] (BUENAVJ2-MIDWAY-DBAAH)	P2	Line Section w/o Fault	139	NA	NA	106	NA	10	107	NA	Review Project: Wheeler Ridge Junction
	P2-1:A15:224:_BUENAVJ2-BITTERWATRSS 230KV [0] NO FAULT	P2	Line Section w/o Fault	129	129	118	98	9	15	99	118	Review Project: Wheeler Ridge Junction
	P2-1:A15:229:_MIDWAY-WHEELER RIDGE #2 230KV [5200] (BUENAVJ2-MIDWAY-D)	P2	Line Section w/o Fault	NA	139	129	NA	17	NA	NA	127	Review Project: Wheeler Ridge Junction
	P2-3:A15:135:_MIDWAY-D 230KV - MIDDLE BREAKER BAY 4	P2	Non-Bus-Tie Breaker	NA	129	118	NA	9	NA	NA	118	Review Project: Wheeler Ridge Junction
	P2-3:A15:21:_MIDWAY-DBAAH 230KV - MIDDLE BREAKER BAY 6	P2	Non-Bus-Tie Breaker	127	NA	NA	98	NA	13	98	NA	Review Project: Wheeler Ridge Junction
	WHEELER 115/70KV TB 2 & BITTERWATRSS-MIDWAY-D 230KV [0]	P6	N-1-1	<100	<100	132	<100	<100	<100	<100	<100	Review Project: Wheeler Ridge Junction
Midway-Wheeler Ridge #2 230 kV Line	P2-1:A15:15:_MIDWAY-WHEELER RIDGE #1 230KV [5190] (BUENAVJ1-MIDWAY-DBAAH)	P2	Line Section w/o Fault	115	NA	NA	84	NA	18	84	NA	Review Project: Wheeler Ridge Junction
	P2-1:A15:228:_MIDWAY-WHEELER RIDGE #1 230KV [5190] (BUENAVJ1-MIDWAY-D)	P2	Line Section w/o Fault	NA	116	106	NA	12	NA	NA	105	Review Project: Wheeler Ridge Junction
	P2-1:A15:15:_MIDWAY-WHEELER RIDGE #1 230KV [5190] (BUENAVJ1-MIDWAY-DBAAH)	P2	Line Section w/o Fault	139	NA	NA	106	NA	19	107	NA	Review Project: Wheeler Ridge Junction
	P2-1:A15:228:_MIDWAY-WHEELER RIDGE #1 230KV [5190] (BUENAVJ1-MIDWAY-D)	P2	Line Section w/o Fault	NA	139	129	NA	17	NA	NA	128	Review Project: Wheeler Ridge Junction
	WHEELER RIDGE-ADOBE SW STA 115KV [1982] & MIDWAY-WHEELER RIDGE #1 230KV [5190]	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	Review Project: Wheeler Ridge Junction
OLD RIVR-OLD_RVR1_TP 70 kV	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	4	13	16	4	NConv	Install redundant battery supply
SEMITROPIC_D-SEMITROPIC_E 115 kV	P2-1:A15:68:_SMYRNA-SEMITROPIC-MIDWAY 115KV [3710] (SEMITRPJ-GANSO)	P2	Line Section w/o Fault	<100	95	100	<100	47	<100	<100	69	Line Capacity Increase
	P2-1:A15:69:_SMYRNA-SEMITROPIC-MIDWAY 115KV [3710] (GANSO-MIDWAY)	P2	Line Section w/o Fault	<100	105	111	<100	46	<100	<100	76	Line Capacity Increase
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	52	NConv	53	61	52	53	NConv	Install redundant battery supply
Semitropic-Famoso 115 kV Line	P1-2:A15:41:_LERDO-KERN OIL-7TH STANDARD 115KV [1950]	P1	N-1	<100	83	90	<100	31	<100	<100	105	Sensitivity Only
	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	82	83	90	59	39	60	60	173	Install redundant battery supply
	P5-2D(NBF):A15:3:_KERN OIL 115KV CB 132 OR 142	P5	Non-Redundent Battery	82	83	90	20	31	67	20	105	Install redundant battery supply
	P5-5C(DC):A15:14:_7TH STANDARD 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	82	83	90	20	31	67	20	105	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	82	83	90	59	39	60	60	173	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	83	NConv	102	73	71	103	NConv	Install redundant battery supply
	P7-1:A15:2:_LIVE OAK-KERN OIL & LERDO-KERN OIL-7TH STANDARD 115 KV LINE	P7	DCTL	82	83	90	20	31	67	20	105	Line Capacity Increase
	P7-1:A15:3:_LERDO-KERN OIL-7TH STANDARD 115 KV LINE & KERN-LIVE OAK 115 KV LINES	P7	DCTL	82	83	90	20	31	67	20	105	Line Capacity Increase
Semitropic-Midway #1 115kV Line	P2-1:A15:70:_SMYRNA-SEMITROPIC-MIDWAY 115KV [3710] (SEMITRPJ-GANSO)	P2	Line Section w/o Fault	106	112	118	39	41	29	39	86	Line Capacity Increase
	P2-1:A15:71:_SMYRNA-SEMITROPIC-MIDWAY 115KV [3710] (GANSO-MIDWAY)	P2	Line Section w/o Fault	116	122	129	42	39	28	42	92	Line Capacity Increase
	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	67	71	75	46	14	2	47	111	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	67	71	75	46	14	2	47	111	Install redundant battery supply
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	71	NConv	59	54	44	59	NConv	Install redundant battery supply
Semitropic-Wasco 70 kV Line	P5-2D(NBF):A15:2:_KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	27	30	33	89	14	32	90	171	Install redundant battery supply
	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	27	30	33	89	14	32	90	171	Install redundant relay
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	30	33	103	55	41	103	NConv	Install redundant relay
Smyrna-Semitropic-Midway 115 kV Line	P1-2:A15:52:_SEMITROPIC-MIDWAY #1 115KV [3630]	P1	N-1	115	121	129	40	43	32	41	87	Line Capacity Increase
	P2-2:A15:28:_SEMITROPIC_E 115KV SECTION 1E	P2	Bus	98	104	109	36	46	36	37	77	Line Capacity Increase
	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	69	NConv	50	57	48	50	NConv	Install redundant relay
	SEMITROPIC-MIDWAY #1 115KV [3630] & 230KV [1] (2)	P6	N-1-1	<100	<100	130	<100	<100	<100	<100	<100	Line Capacity Increase
Taft 115/70 kV Transformer #1	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	48	NConv	42	55	56	41	NConv	Install redundant relay
Taft 115/70 kV Transformer #2	P5-5C(DC):A15:4:_KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	59	NConv	71	42	41	71	NConv	Install redundant relay
Taft-Elk Hills 70 kV Line	Base Case	P0	Basecase	90	89	104	69	63	62	69	90	Mitigation under review

Study Area: PG&E Kern
Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
Taft-Maricopa 70 kV Line	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	274	44	287	104	24	25	105	185	Install redundant relay
	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	274	44	287	104	24	25	105	185	Install redundant relay
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	44	NConv	106	97	88	107	NConv	Install redundant relay
Tejon-SN Brnrd 70 kV Line	P5-5C(DC):A15:8:_ WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	<100	<100	<100	55	50	104	55	88	Install redundant relay
Temblor-San Luis Obispo 115 kV Line	P5-5C(DC):A15:1:_ MIDWAY 500KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	46	NConv	NConv	NConv	NConv	NConv	48	Install redundant relay
Wasco-Famoso 70kV Line	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	NA	NA	NA	71	5	26	72	145	Install redundant relay
	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NA	NA	NA	71	5	26	72	145	Install redundant relay
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NA	NA	NA	81	73	53	82	NConv	Install redundant relay
Weedpatch-San Bernard 70 kV Line	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	44	44	45	50	23	18	50	118	Install redundant relay
	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	44	44	45	50	23	18	50	118	Install redundant relay
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	44	44	45	52	83	81	52	NConv	Install redundant relay
	P5-5C(DC):A15:8:_ WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	<100	<100	<100	135	126	248	136	215	Install redundant relay
	P5-5C(DC):A15:8:_ WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NA	NA	NA	153	98	212	154	262	Install redundant relay
Wheeler Ridge 115/70 kV Transformer #2	Base Case	P0	Basecase	0	0	100	0	31	33	0	0	Generation Redispatch
Wheeler ridge-Lakeview 70kV Line	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	255	<100	253	77	50	58	78	156	Install redundant relay
	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	255	<100	253	77	50	58	78	156	Install redundant relay
	P5-5C(DC):A15:4:_ KERN 230KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	NConv	<100	NConv	84	29	21	84	NConv	Install redundant relay
Wheeler Ridge-San Bernard 70 kV Line	P1-2:A15:90:_ WHEELER RIDGE-TEJON 70KV [9310]	P1	N-1	109	112	122	44	38	59	44	89	Mitigation under review
	P1-1:A15:30:_ KERNCNYN 11.00KV GEN UNIT 1 & P1-2:A15:87:_ WHEELER RIDGE-TEJON 70KV [9310]	P3	G-1/N-1	<100	112	122	<100	<100	<100	<100	93	Mitigation under review
Wheeler Ridge-Tejon 70 kV Line	P1-2:A15:91:_ WHEELER RIDGE-SAN BERNARD 70KV [9300]	P1	N-1	102	104	113	44	41	59	44	86	Mitigation under review
	P1-1:A15:11:_ RIOBRAVO 6.90KV GEN UNIT 2 & P1-2:A15:91:_ WHEELER RIDGE-SAN BERNARD 70KV [9300]	P3	G-1/N-1	102	<100	<100	<100	<100	<100	<100	<100	Mitigation under review
	P1-1:A15:30:_ KERNCNYN 11.00KV GEN UNIT 1 & P1-2:A15:88:_ WHEELER RIDGE-SAN BERNARD 70KV [9300]	P3	G-1/N-1	<100	<100	110	<100	<100	<100	<100	<100	Mitigation under review



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
LOSTHL T 70 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.04	1.05	1.03	1.04	1.04	1.05	System adjustments or voltage support if needed
TWSL J1 70 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.04	1.05	1.03	1.04	1.04	1.05	System adjustments or voltage support if needed
ARCO 70 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.05	1.06	1.04	1.04	1.04	1.05	System adjustments or voltage support if needed
DEVLS DN 70 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.04	1.05	1.04	1.04	1.04	1.05	System adjustments or voltage support if needed
TPMNTP1 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.02	1.02	1.05	1.05	1.04	1.04	1.02	System adjustments or voltage support if needed
TUPMAN 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.04	1.05	1.04	1.04	1.01	System adjustments or voltage support if needed
TPMNTP2 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.05	1.06	1.04	1.04	1.02	System adjustments or voltage support if needed
KERN PWR 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.01	1.05	1.04	1.02	1.05	1.03	System adjustments or voltage support if needed
RIO BRVO 115 kV	Base Case	P0	Base Case	High Voltage	1.01	1.01	1.01	1.05	1.06	1.03	1.04	1.01	System adjustments or voltage support if needed
RNFROTP1 115 kV	Base Case	P0	Base Case	High Voltage	1.01	1.01	1.02	1.04	1.05	1.04	1.04	1.01	System adjustments or voltage support if needed
RENFRO 115 kV	Base Case	P0	Base Case	High Voltage	1.01	1.01	1.02	1.04	1.05	1.04	1.04	1.01	System adjustments or voltage support if needed
RNFROTP2 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.05	1.06	1.04	1.04	1.01	System adjustments or voltage support if needed
SHAFTER 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.05	1.06	1.04	1.04	1.02	System adjustments or voltage support if needed
RENFRO2 115 kV	Base Case	P0	Base Case	High Voltage	1.01	1.01	1.02	1.05	1.06	1.04	1.04	1.01	System adjustments or voltage support if needed
MIDWAY 115 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.05	1.05	1.04	1.06	1.04	1.04	System adjustments or voltage support if needed
RENFRJCT 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.05	1.06	1.04	1.04	1.01	System adjustments or voltage support if needed
NORCO_TA 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.04	1.05	1.04	1.04	1.01	System adjustments or voltage support if needed
NORCO 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.01	1.02	1.04	1.05	1.04	1.04	1.01	System adjustments or voltage support if needed
INERGY 115 kV	Base Case	P0	Base Case	High Voltage	1.01	1.01	1.02	1.04	1.05	1.03	1.03	1.01	System adjustments or voltage support if needed
ARVIN_ED 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.03	1.00	1.05	1.03	1.02	1.04	1.03	System adjustments or voltage support if needed
ARVINJ2 115 kV	Base Case	P0	Base Case	High Voltage	1.02	1.03	1.00	1.05	1.04	1.02	1.04	1.03	System adjustments or voltage support if needed
ROSEDAL 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.01	1.05	1.05	1.02	1.05	1.03	System adjustments or voltage support if needed
TX_ROSDL 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.01	1.05	1.05	1.02	1.05	1.03	System adjustments or voltage support if needed
RIOBRVTM 115 kV	Base Case	P0	Base Case	High Voltage	1.04	1.03	1.04	1.05	1.04	1.05	1.04	1.04	System adjustments or voltage support if needed
FRTLTP 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.02	1.03	1.05	1.05	1.04	1.04	1.02	System adjustments or voltage support if needed



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
FRITO LY 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.02	1.03	1.05	1.05	1.04	1.04	1.02	System adjustments or voltage support if needed
WESTPLAT 115 kV	Base Case	P0	Base Case	High Voltage	1.03	1.02	1.03	1.05	1.05	1.04	1.04	1.02	System adjustments or voltage support if needed
SW85 J1 70 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.02	1.05	1.04	1.03	1.04	1.04	System adjustments or voltage support if needed
UNIONJCT 70 kV	Base Case	P0	Base Case	High Voltage	1.02	1.02	1.02	1.03	1.06	1.03	1.03	1.02	System adjustments or voltage support if needed
PANAMA 70 kV	Base Case	P0	Base Case	High Voltage	1.02	1.02	1.02	1.03	1.06	1.03	1.03	1.02	System adjustments or voltage support if needed
PANMJCT2 70 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.03	1.04	1.05	1.03	1.03	1.03	System adjustments or voltage support if needed
MC FRLND 70 kV	Base Case	P0	Base Case	High Voltage	0.96	0.96	0.95	1.02	1.00	0.98	1.02	0.95	System adjustments or voltage support if needed
CHLME JT 70 kV	Base Case	P0	Base Case	High Voltage	1.03	1.03	1.02	1.05	1.04	1.04	1.04	1.04	System adjustments or voltage support if needed
Q1493 70 kV	Base Case	P0	Base Case	High Voltage	1.04	1.04	1.05	1.06	1.04	1.04	1.04	1.05	System adjustments or voltage support if needed
MC FRLND 70 kV	Base Case	P0	Base Case	Low Voltage	0.96	0.96	0.95	1.02	1.00	0.98	1.02	0.95	Continue to Monitor
WHEELER 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.93	0.89	>0.9	1.03	>0.9	>0.9	0.93	Review Project: Wheeler Ridge Junction
Q1398 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.93	0.89	>0.9	1.03	>0.9	>0.9	0.93	Review Project: Wheeler Ridge Junction
WHLR RJ2 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.94	0.90	>0.9	1.02	>0.9	>0.9	0.94	Review Project: Wheeler Ridge Junction
WHLR RT2 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.94	0.90	>0.9	1.02	>0.9	>0.9	0.94	Review Project: Wheeler Ridge Junction
WND GPJ2 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.94	0.89	>0.9	1.02	>0.9	>0.9	0.94	Review Project: Wheeler Ridge Junction
WND GPT2 230 kV	P2-3:A15:17:_WHEELER 230KV - MIDDLE BREAKER BAY 1	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.93	0.89	>0.9	1.02	>0.9	>0.9	0.94	Review Project: Wheeler Ridge Junction
ELKHIL_G 230 kV	P2-3:A15:25:_MIDWAY-F - 1F 230KV & MIDWAY-F-MIDWAY-R13 #1 LINE	P2	Non-Bus-Tie Breaker	Low Voltage	0.98	>0.9	>0.9	0.99	>0.9	0.87	0.99	>0.9	Sensitivity Only
MIDWAY-F 230 kV	P2-3:A15:25:_MIDWAY-F - 1F 230KV & MIDWAY-F-MIDWAY-R13 #1 LINE	P2	Non-Bus-Tie Breaker	Low Voltage	0.98	>0.9	>0.9	0.99	>0.9	0.90	0.99	>0.9	Sensitivity Only
MCFRLD T 70 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.98	0.98	>0.9	1.01	>0.9	>0.9	0.84	Sensitivity Only
SEMI_TAP 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.82	Sensitivity Only
GOSE LKE 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.80	Sensitivity Only
SMTRPCWS 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.82	Sensitivity Only
SEMITROPIC_D 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.83	Sensitivity Only
WSCOPRSN 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.83	Sensitivity Only
CHARKA 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.84	Sensitivity Only
FAMOSO 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.03	>0.9	>0.9	0.87	Sensitivity Only
SEMITROPIC_E 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.83	Sensitivity Only
WILDWOOD2 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.81	Sensitivity Only



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
FAMOSO 70 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.99	0.99	>0.9	1.02	>0.9	>0.9	0.87	Sensitivity Only
MC FRLND 70 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	0.96	0.95	>0.9	1.00	>0.9	>0.9	0.81	Sensitivity Only
WASCO 70 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.01	>0.9	>0.9	0.82	Sensitivity Only
SEMITRPC 70 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.00	>0.9	>0.9	0.80	Sensitivity Only
WILDWOOD1TP 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.81	Sensitivity Only
WILDWOOD1 115 kV	P2-3:A15:64:_MIDWAY - 2E 115KV & SMYRNA-SEMITROPIC-MIDWAY LINE	P2	Non-Bus-Tie Breaker	Low Voltage	>0.9	NCONV	NCONV	>0.9	1.04	>0.9	>0.9	0.81	Sensitivity Only
SHAFTER 115 kV	P2-4:A15:15:_MIDWAY 115KV - SECTION 2E & 1E	P2	Line Section w/o Fault	Low Voltage	>0.9	0.92	0.90	>0.9	1.11	>0.9	>0.9	0.91	Continue to Monitor
CARRIZO 115 kV	P1-1:A15:19:_KERNRDG332G3 13.80KV GEN UNIT 3 & P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630]	P3	G-1/N-1	Low Voltage	>0.9	>0.9	>0.9	0.89	>0.9	>0.9	0.89	>0.9	Generation Redispatch
KERNRDGE 115 kV	P1-1:A15:19:_KERNRDG332G3 13.80KV GEN UNIT 3 & P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630]	P3	G-1/N-1	Low Voltage	>0.9	>0.9	>0.9	0.82	>0.9	>0.9	0.82	>0.9	Generation Redispatch
TEMBLOR 115 kV	P1-1:A15:19:_KERNRDG332G3 13.80KV GEN UNIT 3 & P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630]	P3	G-1/N-1	Low Voltage	>0.9	>0.9	>0.9	0.83	>0.9	>0.9	0.83	>0.9	Generation Redispatch
MCFRLD T 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.24	NCONV	0.22	0.98	1.00	0.96	0.98	0.83	Install redundant battery supply
CAWLOB T 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.27	NCONV	0.24	0.94	1.02	0.96	0.94	0.76	Install redundant battery supply
CARNAT T 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.26	0.92	1.03	0.96	0.92	0.71	Install redundant battery supply
BSCSCH T 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant battery supply
7STNDRD 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant battery supply
FAMOSO 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	1.00	1.00	0.99	1.03	1.02	1.00	1.03	0.90	Install redundant battery supply
OGLE TAP 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant battery supply
LERDO 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	0.99	1.01	0.85	Install redundant battery supply
OGLE JCT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant battery supply
LRDO JCT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant battery supply
DEXZEL 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant battery supply
KERN OIL 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant battery supply
POSOMTJT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant battery supply
DSCVRYTP 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant battery supply
RASMSNTP 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant battery supply
RASMUSEN 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant battery supply

Study Area: **PG&E Kern**
High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
DISCOVER 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant battery supply
PTRL JCT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.01	1.00	1.01	0.86	Install redundant battery supply
LIVE OAK 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.01	1.02	0.86	Install redundant battery supply
GODN_BER 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant battery supply
KRNFRNTT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant battery supply
CAWELO C 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant battery supply
KERNFRNT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	0.99	1.01	0.84	Install redundant battery supply
POSO MT 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.00	1.00	0.98	1.00	0.83	Install redundant battery supply
VEDDER 115 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	NCONV	NCONV	NCONV	1.00	1.00	0.98	1.00	0.83	Install redundant battery supply
MARICOPA 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.88	1.03	0.86	1.03	1.03	1.03	1.02	0.97	Install redundant battery supply
MOCO_JCT 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.03	0.97	Install redundant battery supply
GARDNER 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.81	1.03	0.79	1.01	1.03	1.03	1.01	0.93	Install redundant battery supply
BSCL_PLD 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant battery supply
GARDNR T 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.81	1.03	0.79	1.01	1.03	1.03	1.01	0.93	Install redundant battery supply
COPUS_D 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant battery supply
COPUS_E 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant battery supply
MRCPAWSTJCT 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.79	1.03	0.77	1.01	1.03	1.03	1.00	0.92	Install redundant battery supply
MRCPAWST 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.79	1.03	0.77	1.01	1.03	1.03	1.00	0.92	Install redundant battery supply
SAN EMDO 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.49	NCONV	0.47	0.95	1.03	1.00	0.95	0.78	Install redundant battery supply
S_KERN 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.64	NCONV	0.62	0.98	1.04	1.02	0.98	0.85	Install redundant battery supply
MAGNDN J 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	1.02	1.02	1.03	0.99	1.03	1.02	0.98	0.89	Install redundant battery supply
S_KERN_TP 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.64	NCONV	0.62	0.98	1.04	1.02	0.98	0.85	Install redundant battery supply
KRN CNYN 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	1.03	1.03	1.03	0.99	1.03	1.02	0.99	0.90	Install redundant battery supply
RIOBRVQF 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	1.02	1.02	1.03	0.99	1.03	1.02	0.99	0.90	Install redundant battery supply
FRUITTAP 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.25	0.94	1.03	0.98	0.94	0.77	Install redundant battery supply

Study Area: **PG&E Kern**
High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
BAKRSFLD 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.25	0.94	1.03	0.98	0.94	0.79	Install redundant battery supply
EISENTP 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.27	NCONV	0.25	0.94	1.02	0.97	0.94	0.78	Install redundant battery supply
EISEN 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.27	NCONV	0.24	0.93	1.01	0.97	0.93	0.77	Install redundant battery supply
MAGUNDEN 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.25	0.98	1.03	1.01	0.97	0.86	Install redundant battery supply
PANMJCT1 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.30	NCONV	0.28	0.92	1.03	0.97	0.92	0.72	Install redundant battery supply
OLD RIVR 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.33	NCONV	0.31	0.92	1.03	0.97	0.92	0.71	Install redundant battery supply
UNIONJCT 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.29	NCONV	0.27	0.92	1.04	0.96	0.91	0.70	Install redundant battery supply
PANAMA 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.29	NCONV	0.26	0.92	1.04	0.96	0.91	0.70	Install redundant battery supply
CARNATIO 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.26	0.92	1.03	0.96	0.92	0.71	Install redundant battery supply
FRUITVLE 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant battery supply
PANMJCT2 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.29	NCONV	0.26	0.92	1.04	0.96	0.92	0.71	Install redundant battery supply
KERN PW1 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant battery supply
MOCO 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.02	0.97	Install redundant battery supply
CADET 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.03	0.97	Install redundant battery supply
KERN PW2 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant battery supply
KRN OL J 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.27	NCONV	0.25	0.94	1.02	0.96	0.93	0.75	Install redundant battery supply
FAMOSO 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.25	NCONV	0.23	0.97	1.01	0.96	0.96	0.81	Install redundant battery supply
CAWELO B 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.27	NCONV	0.24	0.94	1.02	0.96	0.94	0.76	Install redundant battery supply
MC FRLND 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.23	NCONV	0.21	0.98	0.99	0.95	0.98	0.80	Install redundant battery supply
WASCO 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.98	0.97	0.97	0.98	1.01	0.97	0.98	0.86	Install redundant battery supply
OLD_RVR1_TP 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.33	NCONV	0.30	0.92	1.03	0.97	0.92	0.71	Install redundant battery supply
OLD_RVR1 70 kV	P5-2D(NBF):A15:2:_ KERN PP 115KV CB 102 112 132 142 152 212 222 232 262 272 OR 312	P5	Non-Redundent Battery	Low Voltage	0.33	NCONV	0.30	0.92	1.03	0.97	0.92	0.71	Install redundant battery supply
MCFRLD T 70 kV	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.24	NCONV	0.22	0.98	1.00	0.96	0.98	0.83	Install redundant relay
CAWLOB T 70 kV	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.27	NCONV	0.24	0.94	1.02	0.96	0.94	0.76	Install redundant relay
CARNAT T 70 kV	P5-5C(DC):A15:26:_ KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.26	0.92	1.03	0.96	0.92	0.71	Install redundant relay



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
BSCSCH T 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant relay
7STNDRD 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant relay
FAMOSO 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	1.00	1.00	0.99	1.03	1.02	1.00	1.03	0.90	Install redundant relay
OGLE TAP 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant relay
LERDO 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	0.99	1.01	0.85	Install redundant relay
OGLE JCT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant relay
LRDO JCT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant relay
DEXZEL 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant relay
KERN OIL 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant relay
POSOMTJT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant relay
DSCVRYTP 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant relay
RASMSNTP 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant relay
RASMUSEN 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant relay
DISCOVER 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.86	Install redundant relay
PTRL JCT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.01	1.00	1.01	0.86	Install redundant relay
LIVE OAK 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.01	1.02	0.86	Install redundant relay
GODN_BER 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.86	Install redundant relay
KRNFRNTT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	1.00	1.01	0.85	Install redundant relay
CAWELO C 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.02	1.01	1.00	1.02	0.88	Install redundant relay
KERNFRNT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.01	1.00	0.99	1.01	0.84	Install redundant relay
POSO MT 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.00	1.00	0.98	1.00	0.83	Install redundant relay
VEDDER 115 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	1.00	1.00	0.98	1.00	0.83	Install redundant relay
MARICOPA 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.88	1.03	0.86	1.03	1.03	1.03	1.02	0.97	Install redundant relay
MOCO_JCT 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.03	0.97	Install redundant relay
GARDNER 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.81	1.03	0.79	1.01	1.03	1.03	1.01	0.93	Install redundant relay

Study Area: PG&E Kern
High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
BSCL_PLD 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant relay
GARDNR T 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.81	1.03	0.79	1.01	1.03	1.03	1.01	0.93	Install redundant relay
COPUS_D 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant relay
COPUS_E 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.72	1.03	0.70	0.99	1.04	1.03	0.99	0.89	Install redundant relay
MRCPAWSTJCT 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.79	1.03	0.77	1.01	1.03	1.03	1.00	0.92	Install redundant relay
MRCPAWST 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.79	1.03	0.77	1.01	1.03	1.03	1.00	0.92	Install redundant relay
SAN EMDO 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.49	NCONV	0.47	0.95	1.03	1.00	0.95	0.78	Install redundant relay
S_KERN 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.64	NCONV	0.62	0.98	1.04	1.02	0.98	0.85	Install redundant relay
MAGNDN J 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	1.02	1.02	1.03	0.99	1.03	1.02	0.98	0.89	Install redundant relay
S_KERN_TP 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.64	NCONV	0.62	0.98	1.04	1.02	0.98	0.85	Install redundant relay
KRN CNYN 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	1.03	1.03	1.03	0.99	1.03	1.02	0.99	0.90	Install redundant relay
RIOBRVQF 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	1.02	1.02	1.03	0.99	1.03	1.02	0.99	0.90	Install redundant relay
FRUITTAP 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.25	0.94	1.03	0.98	0.94	0.77	Install redundant relay
BAKRSFLD 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.25	0.94	1.03	0.98	0.94	0.79	Install redundant relay
EISENTP 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.27	NCONV	0.25	0.94	1.02	0.97	0.94	0.78	Install redundant relay
EISEN 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.27	NCONV	0.24	0.93	1.01	0.97	0.93	0.77	Install redundant relay
MAGUNDEN 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.25	0.98	1.03	1.01	0.97	0.86	Install redundant relay
PANMJCT1 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.30	NCONV	0.28	0.92	1.03	0.97	0.92	0.72	Install redundant relay
OLD RIVR 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.33	NCONV	0.31	0.92	1.03	0.97	0.92	0.71	Install redundant relay
UNIONJCT 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.29	NCONV	0.27	0.92	1.04	0.96	0.91	0.70	Install redundant relay
PANAMA 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.29	NCONV	0.26	0.92	1.04	0.96	0.91	0.70	Install redundant relay
CARNATIO 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.26	0.92	1.03	0.96	0.92	0.71	Install redundant relay
FRUITVLE 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant relay
PANMJCT2 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.29	NCONV	0.26	0.92	1.04	0.96	0.92	0.71	Install redundant relay
KERN PW1 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant relay

Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
MOCO 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.02	0.97	Install redundant relay
CADET 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.89	1.03	0.87	1.03	1.03	1.03	1.03	0.97	Install redundant relay
KERN PW2 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.28	NCONV	0.26	0.93	1.03	0.97	0.92	0.73	Install redundant relay
KRN OL J 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.27	NCONV	0.25	0.94	1.02	0.96	0.93	0.75	Install redundant relay
FAMOSO 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.25	NCONV	0.23	0.97	1.01	0.96	0.96	0.81	Install redundant relay
CAWELO B 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.27	NCONV	0.24	0.94	1.02	0.96	0.94	0.76	Install redundant relay
MC FRLND 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.23	NCONV	0.21	0.98	0.99	0.95	0.98	0.80	Install redundant relay
WASCO 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.98	0.97	0.97	0.98	1.01	0.97	0.98	0.86	Install redundant relay
OLD_RVR1_TP 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.33	NCONV	0.30	0.92	1.03	0.97	0.92	0.71	Install redundant relay
OLD_RVR1 70 kV	P5-5C(DC):A15:26:_KERN 115KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	0.33	NCONV	0.30	0.92	1.03	0.97	0.92	0.71	Install redundant relay
GRMMWY T 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.82	0.99	0.72	0.82	0.57	Install redundant relay
TEJON 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.73	0.95	0.57	0.73	0.42	Install redundant relay
ORIONTP 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.78	0.98	0.66	0.77	0.49	Install redundant relay
ORION 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.78	0.98	0.66	0.77	0.49	Install redundant relay
SN BRNRD 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.75	0.96	0.60	0.74	0.45	Install redundant relay
MAGNDN J 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.92	1.02	0.86	0.91	0.76	Install redundant relay
ARVIN 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.78	0.98	0.66	0.78	0.50	Install redundant relay
WEEDPTCH 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.83	0.99	0.73	0.82	0.58	Install redundant relay
KRN CNYN 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.92	1.02	0.87	0.92	0.77	Install redundant relay
RIOBRVQF 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.92	1.02	0.87	0.92	0.76	Install redundant relay
MAGUNDEN 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	1.04	1.04	1.04	0.93	1.02	0.89	0.93	0.80	Install redundant relay
GRMWY_SM 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.82	0.99	0.72	0.82	0.57	Install redundant relay
WELLFILD 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.82	0.99	0.72	0.82	0.57	Install redundant relay
ROSE 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.72	0.95	0.56	0.72	0.41	Install redundant relay
PACI_PIP 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.71	0.94	0.55	0.70	0.40	Install redundant relay

Study Area: **PG&E Kern**
High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
GRAPEVNE 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.70	0.94	0.55	0.70	0.40	Install redundant relay
STALLION 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.76	0.97	0.63	0.76	0.47	Install redundant relay
STALIONJ 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.76	0.97	0.63	0.76	0.47	Install redundant relay
LEBEC 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.70	0.93	0.54	0.69	0.39	Install redundant relay
CASTAC 70 kV	P5-5C(DC):A15:8:_WHEELER RIDGE 230-115-70KV BATT(FAILURE OF NON-REDUNDENT BATT)	P5	Non-Redundant Relay	Low Voltage	NCONV	NCONV	NCONV	0.70	0.94	0.54	0.69	0.40	Install redundant relay
Q1398 230 kV	P1-2:A15:104:_BITTERWATRSS-WHEELER 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.90	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHEELER 230 kV	P1-2:A15:104:_BITTERWATRSS-WHEELER 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.90	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
BITTERWATRSS 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
Q1398 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
Q946 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHEELER 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RJ1 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.87	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RJ2 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RT1 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.87	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RT2 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WND GPJ1 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.87	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WND GPJ2 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WND GPT1 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.87	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WND GPT2 230 kV	P1-2:A15:107:_BITTERWATRSS-MIDWAY-D 230KV [0] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	NA	NA	0.86	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHEELER 230 kV	P1-2:A15:23:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.89	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RJ2 230 kV	P1-2:A15:23:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.90	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WHLR RT2 230 kV	P1-2:A15:23:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.90	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
WND GPJ2 230 kV	P1-2:A15:23:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-4:A15:5:_WHEELER SVD=V	P6	N-1-1	Low Voltage	>.9	>.9	0.89	>.9	>.9	>.9	>.9	>.9	Review Project: Wheeler Ridge Junction
ADOBESLR 115 kV	P1-2:A15:27:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-2:A15:3:_BITTERWATRSS-WHEELER 230KV [0]	P6	N-1-1	Low Voltage	>.9	>.9	>.9	0.55	>.9	>.9	0.56	>.9	Review Project: Wheeler Ridge Junction
ADOBESWSTA 115 kV	P1-2:A15:27:_MIDWAY-WHEELER RIDGE #1 230KV [5190] & P1-2:A15:3:_BITTERWATRSS-WHEELER 230KV [0]	P6	N-1-1	Low Voltage	>.9	>.9	>.9	0.55	>.9	>.9	0.56	>.9	Review Project: Wheeler Ridge Junction

Study Area: **PG&E Kern**
High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
CARRIZO 115 kV	P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630] & P1-3:A15:82:_KERNRDGE32G1 13.8/115KV TB 1	P6	N-1-1	Low Voltage	>.9	>.9	>.9	0.89	>.9	>.9	0.89	>.9	Continue to Monitor
KERNRDGE 115 kV	P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630] & P1-3:A15:82:_KERNRDGE32G1 13.8/115KV TB 1	P6	N-1-1	Low Voltage	>.9	>.9	>.9	0.82	>.9	>.9	0.82	>.9	Continue to Monitor
TEMBLOR 115 kV	P1-2:A15:34:_MIDWAY-TEMBLOR 115KV [2630] & P1-3:A15:82:_KERNRDGE32G1 13.8/115KV TB 1	P6	N-1-1	Low Voltage	>.9	>.9	>.9	0.83	>.9	>.9	0.83	>.9	Continue to Monitor
BITTERWATRSS 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6	N-1-1	Low Voltage	0.88	0.88	NA	>.9	>.9	>.9	>.9	0.89	Review Project: Wheeler Ridge Junction
Q1398 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
Q946 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.88	0.88	NA	>.9	>.9	>.9	>.9	0.89	Review Project: Wheeler Ridge Junction
WHEELER 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WHLR RJ1 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.88	0.88	NA	>.9	>.9	>.9	>.9	0.89	Review Project: Wheeler Ridge Junction
WHLR RJ2 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WHLR RT1 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.88	0.88	NA	>.9	>.9	>.9	>.9	0.89	Review Project: Wheeler Ridge Junction
WHLR RT2 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6		Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WND GPJ1 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6	N-1-1	Low Voltage	0.88	0.88	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WND GPJ2 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6	N-1-1	Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WND GPT1 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6	N-1-1	Low Voltage	0.87	0.88	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WND GPT2 230 kV	P1-2:A15:4:_BITTERWATRSS-MIDWAY-DBAAH 230KV [0] & P1-4:A15:7:_WHEELER SVD=V	P6	N-1-1	Low Voltage	0.87	0.87	NA	>.9	>.9	>.9	>.9	0.88	Review Project: Wheeler Ridge Junction
WASCO 70 kV	P1-2:A15:46:_OLIVE SW STA-SMYRNA 115KV [1923] & P1-2:A15:49:_SEMITROPIC-MIDWAY #1 115KV [3630]	P6	N-1-1	Low Voltage	>.9	>.9	0.89	>.9	>.9	>.9	>.9	>.9	Continue to Monitor
WASCO 70 kV	P1-2:A15:49:_SEMITROPIC-MIDWAY #1 115KV [3630] & P1-2:A15:46:_OLIVE SW STA-SMYRNA 115KV [1923]	P6	N-1-1	Low Voltage	>.9	>.9	0.89	>.9	>.9	>.9	>.9	>.9	Continue to Monitor
WHEELER 230 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.54	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
TECUYA T 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.02	1.02	NConv	NConv	Review Project: Wheeler Ridge Junction
GRMMWY T 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.28	0.91	0.89	NConv	NConv	Review Project: Wheeler Ridge Junction
WHEELER 115 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
ADOBESWSTA 115 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
LAKEVIEW 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.41	1.04	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
WHEELER 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.41	1.04	1.04	NConv	NConv	Review Project: Wheeler Ridge Junction
TEJON 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.39	1.02	1.02	NConv	NConv	Review Project: Wheeler Ridge Junction
ORIONTP 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.33	0.98	0.97	NConv	NConv	Review Project: Wheeler Ridge Junction
ORION 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.33	0.98	0.97	NConv	NConv	Review Project: Wheeler Ridge Junction
SN BRNRD 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.37	1.02	1.01	NConv	NConv	Review Project: Wheeler Ridge Junction
MAGNDN J 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.16	0.83	0.82	NConv	NConv	Review Project: Wheeler Ridge Junction
ARVIN 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.33	0.98	0.96	NConv	NConv	Review Project: Wheeler Ridge Junction
WEEDPTCH 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.29	0.91	0.90	NConv	NConv	Review Project: Wheeler Ridge Junction
KRN CNYN 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.16	0.84	0.83	NConv	NConv	Review Project: Wheeler Ridge Junction
RIOBRVQF 70 kV	P7-1:A15:17:_MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.16	0.84	0.82	NConv	NConv	Review Project: Wheeler Ridge Junction



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
FRUITTAP 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	1.04	1.04	1.04	1.06	0.92	0.90	NConv	NConv	Review Project: Wheeler Ridge Junction
BAKRSFLD 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	1.04	1.04	1.04	1.08	0.89	0.87	NConv	NConv	Review Project: Wheeler Ridge Junction
EISENTP 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	1.03	1.03	1.03	1.07	0.88	0.86	NConv	NConv	Review Project: Wheeler Ridge Junction
EISEN 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	1.02	1.03	1.03	1.06	0.88	0.86	NConv	NConv	Review Project: Wheeler Ridge Junction
MAGUNDEN 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	1.04	1.04	1.04	1.14	0.83	0.81	NConv	NConv	Review Project: Wheeler Ridge Junction
GRMWY_SM 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.28	0.91	0.89	NConv	NConv	Review Project: Wheeler Ridge Junction
WELLFILD 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.28	0.91	0.89	NConv	NConv	Review Project: Wheeler Ridge Junction
3EMIDIO 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.41	1.03	1.02	NConv	NConv	Review Project: Wheeler Ridge Junction
VALPREDO 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.41	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
ROSE 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.39	1.02	1.01	NConv	NConv	Review Project: Wheeler Ridge Junction
PACI_PIP 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.38	1.01	1.00	NConv	NConv	Review Project: Wheeler Ridge Junction
TECUYA 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.02	1.02	NConv	NConv	Review Project: Wheeler Ridge Junction
GRAPEVNE 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.38	1.01	1.00	NConv	NConv	Review Project: Wheeler Ridge Junction
STALLION 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.35	1.00	0.99	NConv	NConv	Review Project: Wheeler Ridge Junction
STALIONJ 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.35	1.00	0.99	NConv	NConv	Review Project: Wheeler Ridge Junction
LEBEC 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.38	1.00	1.00	NConv	NConv	Review Project: Wheeler Ridge Junction
EMDO JCT 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.41	1.04	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
CASTAC 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.38	1.01	1.00	NConv	NConv	Review Project: Wheeler Ridge Junction
KELLEY 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.02	1.02	NConv	NConv	Review Project: Wheeler Ridge Junction
ADOBESLR 115 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.40	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction
Q1397 70 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.42	1.03	1.04	NConv	NConv	Review Project: Wheeler Ridge Junction
Q1398 230 kV	P7-1:A15:17: _MIDWAY-WHEELER RIDGE #1 & #2 230 KV LINES	P7	DCTL	Low Voltage	NConv	NConv	NConv	1.54	1.03	1.03	NConv	NConv	Review Project: Wheeler Ridge Junction

Study Area: PG&E Kern

Voltage Deviation



Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)					Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2027 SP High CEC Forecast	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	
None												

Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios				Sensitivity Scenarios		
			2024 Spring Off-Peak	2027 Summer Peak	2032 Summer Peak	2032 Spring Off-Peak	2027 SP High CEC Forecast	2024 OP Sensitivity	
Midway-Caliente Sw. Station 230 kV line	P1-2	N-1	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Kern PP 230/115 kV #13 Transformer 3Ø fault with normal clearing.	P1-3	N-1	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Midway 230/115 Bank Transformer 3Ø fault with normal clearing.	P1-3	N-1	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Wheeler 230 kV Cap Bank 3Ø fault with normal clearing.	P1-4	N-1	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Midway 230 kV bus SLG fault with normal clearing.	P2-2	Bus Section Fault	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Midway 115 kV bus-tie breaker SLG fault with normal clearing.	P2-4	Internal Breaker Fault(Bus Tie Fault)	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Kern Power to 7 Standard 115 kV line fault with normal clearing with Mt. Poso Offline in the case	P3-2	G-1/N-1	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Tx Sunset SLG fault expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-1	Stuck Breaker	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Kern Power to 7 Standard 115 kv line expanded to elements lost due to stuck breaker and clear fault from remote breakers with normal clearing time.	P4-2	Stuck Breaker	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
La Paloma SLG Fault with delayed clearing	P5-1	Non Redundant Relay	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review
Midway-Wheeler Ridge #1 & #2 230 kV Lines SLG fault with successful high speed reclose.	P7	DCTL	No Issue	TBD	No Issue	No Issue	TBD	No Issue	Under Review

Study Area: PG&E Kern



Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)													Potential Mitigation Solutions
			2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2032 Spring Off-Peak	2027 SP High CEC Forecast	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2032 SP with Additional Transportation Electrification	

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

Study Area: PG&E Kern



Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)													Potential Mitigation Solutions
	2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2032 Spring Off-Peak	2027 SP High CEC Forecast	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2032 SP with Additional Transportation Electrification	

No single source substation with more than 100 MW