

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
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Charka-CHSR 115 kV	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	<100	89	75	<100	118	91	<100	<100	Generation redispatch
	MIDWAY 115kV Section 2E	P2-2	Bus	<100	89	75	<100	118	91	<100	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	<100	89	75	<100	118	91	<100	<100	Generation redispatch
CHARKA-FAMOSO 115 kV	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	88	112	100	<100	122	115	77	<100	Under Review
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	88	112	100	<100	122	115	77	<100	Under Review
	MIDWAY 115kV Section 2E	P2-2	Bus	88	112	100	<100	121	115	77	<100	Under Review
Copus 70 kV bus-tie	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	30	35	35	<100	104	33	108	<100	Generation redispatch
Copus-Old River 70 kV Line	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	29	15	17	<100	188	12	159	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	30	11	13	<100	240	8	215	68	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	29	11	14	<100	240	9	215	69	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	57	65	69	<100	221	60	223	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	53	61	65	<100	271	56	276	68	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	53	61	65	<100	271	56	276	69	Generation redispatch
Fellows-Midsun 115 kV Line	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	10	12	11	<100	103	11	94	<100	Generation redispatch
Fellows-Taft 115 kV Line	TAFT 115kV - Ring R2 & R1	P2-3	Non-Bus-Tie Breaker	27	29	31	61	95	27	101	102	Sensitivity only
	MIDWAY - 2D 115kV & MIDWAY-TEMBLOR line	P2-3	Non-Bus-Tie Breaker	15	19	20	50	98	17	96	100	Sensitivity only
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	11	14	15	<100	102	12	98	<100	Generation redispatch
Kern Canyon-Magunden-Weedpatch 70 kV Line	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	150	<100	<100	17	<100	<100	21	20	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	129	<100	<100	<100	<100	<100	14	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	116	<100	<100	<100	<100	<100	34	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	116	<100	<100	<100	<100	<100	34	<100	PGE Maintenance Bus Conversion Project
	MIDWAY-WHEELER RIDGE #2 230kV [5200] (BUENAVJ2-MIDWAY)	P2-1	Line Section w/o Fault	<100	59	42	<100	112	59	<100	<100	Generation redispatch
	MIDWAY-WHEELER RIDGE #1 230kV [5190] (BUENAVJ1-MIDWAY)	P2-1	Line Section w/o Fault	<100	58	42	<100	111	58	<100	<100	Generation redispatch
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	164	<100	<100	<100	<100	<100	25	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	147	<100	<100	<100	<100	<100	17	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	126	<100	<100	<100	<100	<100	39	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	126	<100	<100	<100	<100	<100	39	<100	PGE Maintenance Bus Conversion Project
	MIDWAY-WHEELER RIDGE #2 230kV [5200] (BUENAVJ2-MIDWAY)	P2-1	Line Section w/o Fault	<100	86	63	<100	115	87	<100	<100	Generation redispatch
	MIDWAY-WHEELER RIDGE #1 230kV [5190] (BUENAVJ1-MIDWAY)	P2-1	Line Section w/o Fault	<100	86	63	<100	114	86	<100	<100	Generation redispatch
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	183	<100	<100	26	<100	<100	57	24	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	164	<100	<100	<100	<100	<100	50	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	149	<100	<100	<100	<100	<100	69	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	149	<100	<100	<100	<100	<100	69	<100	PGE Maintenance Bus Conversion Project
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	245	16	NConv	NConv	143	20	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	275	<100	NConv	NConv	165	<100	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	222	26	NConv	NConv	117	24	Utilize Summer setup
Kern PP-Bakersfield 230 kV	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	<100	23	27	<100	110	23	<100	<100	Generation redispatch
	MIDWAY 230kV Section 2E & MIDWAY-MIDWAY-R11 #1 line	P2-3	Non-Bus-Tie Breaker	15	30	18	11	107	32	12	<100	Generation redispatch
	MIDWAY - 1E 230kV & MIDWAY-MIDWAY-R11 #1 line	P2-4	Bus-Tie-Breaker	15	23	27	11	110	23	12	<100	Generation redispatch
Kern PP-Seventh Standard 115 kV Line	KERN PWR 115kV - Section 1E & 2E	P2-4	Bus-Tie-Breaker	120	142	<100	49	72	144	51	28	Under Review
Kern PP-Westpark #1 115 kV Line	KERN PWR 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	99	115	<100	31	61	116	47	11	Under Review
Kern-Kern Oil-Famoso 70 kV Line	MIDWAY 115kV Section 2E	P2-2	Bus	101	118	119	24	104	121	49	12	Utilize Summer setup
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	101	118	119	24	104	121	49	12	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	101	118	119	24	103	121	49	12	Utilize Summer setup
	MIDWAY 115kV Section 2E	P2-2	Bus	74	87	87	18	76	89	36	<100	Sensitivity only
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	74	87	87	18	76	89	36	<100	Sensitivity only
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	74	87	87	<100	76	89	36	<100	Sensitivity only
	MIDWAY 115kV Section 2E	P2-2	Bus	95	112	113	19	106	115	50	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	95	112	113	19	106	115	50	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	95	112	113	<100	105	115	49	<100	Utilize Summer setup
	MIDWAY 115kV Section 2E	P2-2	Bus	104	123	124	20	116	126	54	<100	Utilize Summer setup

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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	104	123	124	20	115	126	54	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	104	123	124	20	115	126	53	<100	Utilize Summer setup
Kern-Magunden 70 kV Line	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	137	<100	<100	14	<100	<100	37	16	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	121	<100	<100	<100	<100	<100	32	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	111	<100	<100	<100	<100	<100	47	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	111	<100	<100	<100	<100	<100	47	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	137	<100	<100	14	<100	<100	37	16	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	121	<100	<100	<100	<100	<100	31	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	111	<100	<100	<100	<100	<100	47	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	111	<100	<100	<100	<100	<100	47	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	150	<100	<100	17	<100	<100	21	20	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	129	<100	<100	<100	<100	<100	14	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	117	<100	<100	<100	<100	<100	34	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	117	<100	<100	<100	<100	<100	34	<100	PGE Maintenance Bus Conversion Project
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	184	13	NConv	NConv	90	16	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	184	13	NConv	NConv	90	16	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	245	16	NConv	NConv	143	20	Utilize Summer setup
Lerdo-Famoso 115 kV Line	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	106	126	116	<100	114	129	58	<100	Utilize Summer setup
	MIDWAY 115kV Section 2E	P2-2	Bus	106	126	116	<100	114	129	58	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	106	126	116	<100	114	129	58	<100	Utilize Summer setup
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	104	<100	<100	<100	<100	<100	36	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	74	93	79	27	139	96	83	26	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	74	93	79	<100	139	96	84	<100	Generation redispatch
	MIDWAY 115kV Section 2E	P2-2	Bus	74	93	79	27	139	96	83	26	Generation redispatch
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	106	126	116	<100	105	129	54	<100	Utilize Summer setup
	MIDWAY 115kV Section 2E	P2-2	Bus	106	126	116	<100	105	129	54	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	106	126	116	<100	106	129	54	<100	Utilize Summer setup
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	103	<100	<100	<100	<100	<100	33	<100	Utilize Summer setup
Lerdo-Kern Oil-7th Standard 115 kV Line	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	112	135	124	13	137	138	65	18	Under Review
	MIDWAY 115kV Section 2E	P2-2	Bus	112	135	124	13	137	138	65	18	Under Review
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	112	135	124	13	137	138	65	18	Under Review
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	107	<100	<100	13	<100	<100	44	18	PGE Maintenance Bus Conversion Project
	KERN PWR 115kV - Section 1E & 2E	P2-4	Bus-Tie-Breaker	115	124	<100	36	51	126	49	<100	Under Review
	KERN PWR 115kV - Section 1E & 2E	P2-4	Bus-Tie-Breaker	181	191	<100	58	76	194	80	21	Under Review
Live Oak-Kern Oil 115 kV Line	WESTPARK-MAGUNDEN 115kV [4130] MOAS OPENED on COLUMBUS_BEAR TAP	P1	N-1	98	102	33	29	39	102	79	20	Project Under Review
	KERN-MAGUNDEN-WITCO 115kV [1970]	P1	N-1	95	107	32	31	28	108	75	17	Project Under Review
	7TH STANDARD-KERN 115kV [1981]	P1	N-1	95	106	32	35	25	107	73	13	Project Under Review
	KERN OIL-WITCO 115kV [1920]	P1	N-1	90	102	31	28	23	103	70	14	Project Under Review
	KERN-MAGUNDEN-WITCO 115kV [1970] (KERN PWR-KERNWATR)	P2-1	Line Section w/o Fault	112	121	37	42	30	122	84	21	Project Under Review
	KERN-MAGUNDEN-WITCO 115kV [1970] (KRN OL J-KERNWATR)	P2-1	Line Section w/o Fault	110	119	36	41	27	119	81	19	Project Under Review
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	104	112	35	29	20	113	56	20	Project Under Review
	MIDWAY 115kV Section 2E	P2-2	Bus	104	112	35	29	20	113	56	20	Project Under Review
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	104	112	35	29	20	113	56	20	Project Under Review
	WESTPARK 115kV Bus (failure of non-redundent relay actually semi)	P5	Non-Redundant Relay	98	102	33	29	39	103	79	20	Add redundant Protection
	MAGUNDEN 115kV Bus (failure of non-redundent relay)	P5	Non-Redundant Relay	97	109	33	31	29	110	76	17	Add redundant Protection
	WITCO SS 115kV BUS (failure of non-redundent relay)	P5	Non-Redundant Relay	90	102	31	28	23	103	70	14	Add redundant Protection
	7TH STANDARD-KERN 115kV [1981] & KERN-MAGUNDEN-WITCO 115kV [1970]	P6	N-1-1	148	<100	<100	<100	<100	<100	<100	<100	Project Under Review
	Kern PP-Westpark No. 1 & 2 115 kV Lines	P7	DCTL	102	105	34	29	27	106	75	20	Project Under Review
	Kern-Magunden-Witco & Westpark-Magunden 115 kV Lines	P7	DCTL	96	108	32	30	27	108	74	16	Project Under Review
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	<100	28	24	<100	188	23	172	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	<100	31	26	<100	149	26	131	<100	Generation redispatch



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				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Maricopa-Copus 70 kV Line	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	<100	31	25	<100	148	26	130	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	<100	31	25	<100	190	26	174	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	72	80	78	<100	219	76	236	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	76	83	80	<100	181	80	195	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	74	83	79	<100	180	78	193	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	74	83	79	<100	222	79	238	<100	Generation redispatch
Midsun-Midway 115 kV Line	MIDWAY-TAFT 115kV [2620]	P1	N-1	20	23	21	70	72	23	58	100	Sensitivity only
	MIDWAY - 2D 115kV & MIDWAY-TEMBLOR line	P2-3	Non-Bus-Tie Breaker	19	22	20	71	72	22	59	100	Sensitivity only
	TAFT 115kV - Ring R2 & R1	P2-3	Non-Bus-Tie Breaker	18	24	22	78	69	23	62	102	Sensitivity only
Midway 230/115 kV Transformer #3	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	143	<100	<100	<100	<100	<100	65	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	112	<100	<100	<100	<100	<100	35	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	112	<100	<100	<100	<100	<100	35	<100	PGE Maintenance Bus Conversion Project
	MIDWAY - 2D 230kV & MIDWAY-MIDWAY-R12 #1 line	P2-4	Bus-Tie-Breaker	108	<100	<100	<100	<100	<100	44	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 2D	P2-2	Bus	108	<100	<100	<100	<100	<100	44	<100	PGE Maintenance Bus Conversion Project
Midway-Bakersfield 230 kV	MIDWAY 230kV - Middle Breaker Bay 3	P2-3	Non-Bus-Tie Breaker	<100	118	23	<100	71	119	<100	<100	Under Review
	MIDWAY 230kV Section 2E & MIDWAY-MIDWAY-R11 #1 line	P2-3	Non-Bus-Tie Breaker	<100	49	11	<100	107	51	<100	<100	Generation redispatch
	MIDWAY - 1E 230kV & MIDWAY-MIDWAY-R11 #1 line	P2-4	Bus-Tie-Breaker	<100	30	18	<100	110	31	<100	<100	Generation redispatch
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	<100	30	18	<100	110	31	<100	<100	Generation redispatch
Midway-Kern #1 230 kV Line	MIDWAY Section 2D & MIDWAY Section 2E 230kV	P2-4	Bus-Tie-Breaker	117	<100	<100	33	<100	<100	23	34	PGE Maintenance Bus Conversion Project
	MIDWAY-KERN #3 230kV [5160] & KERN PP-BKRSFLDB-MIDWAY 230kV [0]	P6	N-1-1	110	<100	<100	<100	<100	<100	<100	<100	Project:Midway-Kern PP 230 kV #2 Line Project Short Term : Action Plan
	Midway-Kern No. 3 & Midway-Kern No. 4 230 kV Lines	P7	DCTL	110	<100	<100	33	<100	<100	22	35	Project:Midway-Kern PP 230 kV #2 Line Project Short Term : Action Plan
Midway-Kern #4 230 kV Line	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	150	<100	<100	18	<100	<100	12	25	PGE Maintenance Bus Conversion Project
	KERN PP-MIDWAY 230kV [0] & MIDWAY-KERN #3 230kV [5160]	P6	N-1-1	102	<100	<100	<100	<100	<100	<100	<100	Project:Midway-Kern PP 230 kV #2 Line Project Short Term : Action Plan
	Midway-Kern No. 3 & Midway-Kern No. 1 230 kV Lines	P7	DCTL	102	<100	<100	28	<100	<100	17	35	Project:Midway-Kern PP 230 kV #2 Line Project Short Term : Action Plan
Midway-Lapaloma #1 230 kV Line	MIDWAY-D-LAPALOMA #2 230kV [0]	P1	N-1	100	112	100	<100	<100	112	<100	<100	Under Review
	MIDWAY 230kV - Middle Breaker Bay 3	P2-3	Non-Bus-Tie Breaker	<100	112	100	<100	<100	112	<100	<100	Under Review
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	117	<100	<100	43	<100	<100	<100	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	113	<100	<100	<100	<100	<100	<100	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	113	<100	<100	<100	<100	<100	<100	<100	PGE Maintenance Bus Conversion Project
	MIDWAY - 1D 230kV & MIDWAY-WHEELER RIDGE #1 line	P2-4	Bus-Tie-Breaker	113	<100	<100	43	<100	<100	<100	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	113	<100	<100	<100	<100	<100	<100	<100	PGE Maintenance Bus Conversion Project
	LAPALOMA 230kV - Middle Breaker Bay 2	P2-3	Non-Bus-Tie Breaker	100	112	100	<100	<100	112	<100	<100	Under Review
	MIDWAY-E-LAPALOMA #1 230kV [0]	P1	N-1	88	99	88	<100	<100	99	<100	<100	Sensitivity only
	MIDWAY Section 2D & MIDWAY Section 2E 230kV	P2-4	Bus-Tie-Breaker	<100	100	88	<100	<100	100	<100	<100	Sensitivity only
	MIDWAY Section 2E & MIDWAY-F Section 2F 230kV	P2-4	Bus-Tie-Breaker	88	100	88	<100	<100	100	<100	<100	Sensitivity only
	MIDWAY 230kV Section 2E	P2-2	Bus	88	100	88	<100	<100	100	<100	<100	Sensitivity only
	MIDWAY 230kV Section 2E & MIDWAY-MIDWAY-R11 #1 line	P2-3	Non-Bus-Tie Breaker	88	100	88	<100	<100	100	<100	<100	Sensitivity only
Midway-Temblor 115 kV Line	MIDWAY-TEMBLOR 115kV [2630] (TEMBLOR-PSE MCKJ)	P2-1	Line Section w/o Fault	42	43	26	41	94	43	105	101	Sensitivity only
	TEMBLOR 115kV Section 1D	P2-2	Bus	42	43	26	41	94	43	105	102	Sensitivity only
	TEMBLOR - 1D 115kV & TEMBLOR-SAN LUIS OBISPO line	P2-3	Non-Bus-Tie Breaker	42	43	26	41	94	43	105	102	Sensitivity only
	Caliente Sw Sta - Midway #1 & #2 230 kV Lines	P7	DCTL	39	43	15	<100	137	45	140	<100	Generation redispatch
Midway-Tunman-Bonfro 115 kV Line	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	94	94	103	50	23	96	38	10	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	27	26	116	<100	16	26	<100	<100	Utilize Summer setup
	MIDWAY - 2D 115kV & MIDWAY-TEMBLOR line	P2-3	Non-Bus-Tie Breaker	27	26	119	19	16	26	<100	<100	Utilize Summer setup



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
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Midway-Tupman-Renfro 115 kV Line	MIDWAY 115kV Section 2D	P2-2	Bus	27	26	118	19	16	26	<100	<100	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	27	26	118	19	16	26	<100	<100	Utilize Summer setup
	MIDWAY-RENFRO-TUPMAN 115kV [2590] (MIDWAY-TPMNTP1)	P2-1	Line Section w/o Fault	27	26	119	19	16	26	<100	<100	Utilize Summer setup
Midway-Tupman-Rio Bravo-Renfro 115 kV Line	MIDWAY 115kV Section 2D	P2-2	Bus	46	47	103	28	21	48	13	12	Utilize Summer setup
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	46	47	102	27	20	48	13	12	Utilize Summer setup
	MIDWAY - 2D 115kV & MIDWAY-TEMBLOR line	P2-3	Non-Bus-Tie Breaker	46	47	103	28	21	48	13	12	Utilize Summer setup
	MIDWAY-RENFRO-TUPMAN 115kV [2590] (MIDWAY-TPMNTP1)	P2-1	Line Section w/o Fault	45	47	105	28	20	48	14	12	Utilize Summer setup
Midway-Wheeler Ridge #1 230 kV Line	MIDWAY Section 2D & MIDWAY Section 2E 230kV	P2-4	Bus-Tie-Breaker	113	<100	<100	<100	<100	<100	72	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 2D & MIDWAY Section 2D 230kV	P2-4	Bus-Tie-Breaker	112	<100	<100	<100	<100	<100	72	<100	PGE Maintenance Bus Conversion Project
	MIDWAY - 2D 230kV & MIDWAY-MIDWAY-R12 #1 line	P2-4	Bus-Tie-Breaker	111	<100	<100	<100	<100	<100	73	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 2D	P2-2	Bus	111	<100	<100	<100	<100	<100	73	<100	PGE Maintenance Bus Conversion Project
	MIDWAY-WHEELER RIDGE #2 230kV [5200] (BUENAVJ2-MIDWAY)	P2-1	Line Section w/o Fault	109	<100	<100	<100	<100	<100	71	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 2D & MIDWAY Section 2E 230kV	P2-4	Bus-Tie-Breaker	104	<100	<100	37	<100	<100	62	28	PGE Maintenance Bus Conversion Project
	MIDWAY Section 2D & MIDWAY Section 2D 230kV	P2-4	Bus-Tie-Breaker	102	<100	<100	<100	<100	<100	61	<100	PGE Maintenance Bus Conversion Project
	MIDWAY - 2D 230kV & MIDWAY-MIDWAY-R12 #1 line	P2-4	Bus-Tie-Breaker	102	<100	<100	<100	<100	<100	63	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 2D	P2-2	Bus	102	<100	<100	<100	<100	<100	63	<100	PGE Maintenance Bus Conversion Project
Midway-Wheeler Ridge #2 230 kV Line	MIDWAY-WHEELER RIDGE #1 230kV [5190] (BUENAVJ1-MIDWAY)	P2-1	Line Section w/o Fault	109	<100	<100	<100	<100	<100	71	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D & MIDWAY-MIDWAY-R12 #1 line	P2-3	Non-Bus-Tie Breaker	107	<100	<100	<100	<100	<100	75	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1E 230kV	P2-4	Bus-Tie-Breaker	107	<100	<100	<100	<100	<100	74	<100	PGE Maintenance Bus Conversion Project
	MIDWAY 230kV Section 1D	P2-2	Bus	106	<100	<100	<100	<100	<100	72	<100	PGE Maintenance Bus Conversion Project
	MIDWAY Section 1D & MIDWAY Section 1D 230kV	P2-4	Bus-Tie-Breaker	106	<100	<100	<100	<100	<100	72	<100	PGE Maintenance Bus Conversion Project
Semitropic-CHSR 115 kV	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	<100	88	74	<100	119	90	<100	<100	Generation redispatch
	MIDWAY 115kV Section 2E	P2-2	Bus	<100	88	74	<100	119	90	<100	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	<100	88	74	<100	119	90	<100	<100	Generation redispatch
Semitropic-Famoso 115 kV Line	KERN PWR 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	98	105	<100	22	33	106	63	17	Utilize Summer setup
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	66	88	72	<100	128	90	96	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	66	88	72	<100	128	90	96	<100	Generation redispatch
	MIDWAY 115kV Section 2E	P2-2	Bus	66	88	72	<100	128	90	96	<100	Generation redispatch
	MT POSO 13.80kV Gen Unit 1 & LERDO-KERN OIL-7TH STANDARD 115kV [1950]	P3	G-1/N-1	<100	104	110	<100	<100	105	97	<100	Utilize Summer setup
	MT POSO 13.80kV Gen Unit 1 & LERDO-KERN OIL-7TH STANDARD 115kV [1950]	P6	N-1-1	112	104	110	<100	<100	105	<100	<100	Utilize Summer setup
Semitropic-Wasco 70 kV Line	MIDWAY 115kV Section 2E	P2-2	Bus	39	58	49	<100	107	59	92	<100	Generation redispatch
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	39	58	49	<100	107	59	92	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	39	57	49	<100	106	59	91	<100	Generation redispatch
Smyrna-Semitropic-Midway 115 kV Line	SEMITROPIC-MIDWAY #1 115kV [3630]	P1	N-1	52	58	50	41	70	59	33	100	Sensitivity only
Taft-Cuyama #1 70 kV Line	Base Case	P0	Base case	27	26	26	19	21	27	100	82	Sensitivity only
Taft-Maricopa 70 kV Line	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	12	29	28	<100	126	25	121	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	20	52	49	<100	151	48	144	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	<100	29	28	<100	104	26	97	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 1D	P2-4	Bus-Tie-Breaker	12	29	28	<100	126	25	121	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	68	76	76	<100	158	73	181	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	91	100	98	<100	182	97	204	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	60	66	64	<100	126	63	141	<100	Generation redispatch
	Midway-Taft & Fellows-Taft 115 kV Lines	P7	DCTL	68	76	76	<100	158	73	181	<100	Generation redispatch
Wasco-Famoso 70 kV Line	MIDWAY 115kV Section 2E	P2-2	Bus	60	81	78	<100	105	83	77	<100	Generation redispatch
	MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	60	81	78	<100	105	83	77	<100	Generation redispatch
	MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	60	81	78	<100	105	83	76	<100	Generation redispatch
Weedpatch-San Bernard 70 kV Line	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	195	<100	NConv	NConv	125	<100	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	196	<100	NConv	NConv	70	<100	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	177	<100	NConv	NConv	113	<100	Utilize Summer setup
	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	197	<100	NConv	NConv	70	<100	Utilize Summer setup
Westpark-Magunden (Columbus-Magunden) 115 kV	KERN PWR 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	98	126	<100	27	35	127	64	28	Under Review



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)					Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
Wheeler Ridge-Weedpatch 70 kV Line	Midway-Wheeler Ridge #1 & #2 230 kV Lines	P7	DCTL	NConv	NConv	120	<100	NConv	NConv	60	<100	Utilize Summer setup

Study Area: PG&E Kern

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)					Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
GANSO 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.96	0.89	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
GANSO 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
GANSO 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
GOSE LKE 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.95	0.90	NA	1.05	0.95	1.04	NA	Utilize Summer Setup
GOSE LKE 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.95	0.90	NA	1.05	0.95	1.04	NA	Utilize Summer Setup
GOSE LKE 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.95	0.90	NA	1.05	0.95	1.04	NA	Utilize Summer Setup
MC FRLND 70	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.96	0.95	0.88	1.01	1.02	0.94	1.01	1.03	Utilize Summer Setup
MC FRLND 70	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.96	0.95	0.88	1.01	1.02	0.94	1.01	1.03	Utilize Summer Setup
MC FRLND 70	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.96	0.95	0.88	1.01	1.02	0.94	1.01	1.03	Utilize Summer Setup
PONDROAD 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.96	0.89	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
PONDROAD 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
PONDROAD 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
SEMITROPIC_E 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SEMITROPIC_E 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SEMITROPIC_E 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SMTRPCWS 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SMTRPCWS 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SMTRPCWS 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.95	1.03	NA	Utilize Summer Setup
SMYRNA 115	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.98	0.96	0.89	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
SMYRNA 115	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
SMYRNA 115	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.98	0.96	0.90	NA	1.04	0.96	1.03	NA	Utilize Summer Setup
WASCO 70	P2-2:A15:40:_MIDWAY 115kV Section 2E	P2-2	Bus	0.96	0.94	0.88	NA	1.01	0.94	1.00	NA	Utilize Summer Setup
WASCO 70	P2-4:A15:14:_MIDWAY 115kV - Section 2D & 2E	P2-4	Bus-Tie-Breaker	0.96	0.94	0.88	NA	1.01	0.94	1.00	NA	Utilize Summer Setup
WASCO 70	P2-4:A15:15:_MIDWAY 115kV - Section 2E & 1E	P2-4	Bus-Tie-Breaker	0.96	0.94	0.88	NA	1.01	0.94	1.00	NA	Utilize Summer Setup

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
				2023 Summer Peak	2026 Summer Peak	2031 Summer Peak	2023 Spring Off-Peak	2026 Spring Off-Peak	2026 SP High CEC Forecast	2023 SP Heavy Renewable & Min Gas Gen	2023 OP Heavy Renewable & Min Gas Gen	
None												

Study Area: PG&E Kern

Transient Stability



Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios				Sensitivity Scenarios		
			2023 Spring Off-Peak	2026 Summer Peak	2031 Summer Peak	2031 Spring Off-Peak	2026 SP High CEC Forecast	2023 OP Heavy Renewable & Min Gas Gen	

In accordance with TPL-001-4- Requirement R2.6, this area relies on the past studies from the 2020-21 Transmission Planning Process.

<http://www.caiso.com/Documents/BoardApproved2020-2021TransmissionPlan.pdf>





Study Area: PG&E Kern



Single Contingency Load Drop

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

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

Study Area: **PG&E Kern**



Single Source Substation with more than 100 MW Load

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

No single source substation with more than 100 MW