

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)								Loading % (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
30435 LAKEVILLE 230 30445 IGNACIO 230 2 1	LAKEVILLE - IGNACIO #1 & LAKEVILLE - SOBRANTE #2 LINES	P7	DCTL	73	78	101	36	49	43	48	65	95	58	53	101	Operating Solution or SPS
	LAKEVILLE-IGNACIO #1 & LAKEVILLE-SOBRANTE #2 230KV LINES	P7	DCTL	73	78	101	36	49	43	48	65	95	58	53	101	Operating Solution or SPS
30435 LAKEVILLE 230 30460 VACA-DIX 230 2 1	LAKEVILE 230KV - SECTION 2E & 2D	P2	Bus-tie Breaker	91	98	118	<100	<100	<100	70	113	114	43	<100	119	Bus Upgrade
	GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	79	85	105	<100	<100	<100	67	97	100	49	<100	105	Operating Solution or SPS
	LAKEVILLE-TULUCAY & VACA-LAKEVILLE #1 LINES	P7	DCTL	76	85	111	<100	<100	<100	58	101	108	31	<100	111	Operating Solution or SPS
31200 MENDOCNO 115 31260 MND CNO M 115 1 1	UKIAH-HOPLAND-CLOVERDALE 115KV [4050] & CORTINA 115KV [1330] MOAS OPENED ON LUCERNJ1_LUCERNE	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	112	<100	<100	<100	<100	Operating Solution or SPS
31224 INDIN VL 115 31215 LUCERNJ1 115 1 1	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	78	90	102	17	18	93	51	98	99	24	23	102	Operating Solution or SPS
	EGLE RCK 115/60KV TB 1 & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	<100	103	<100	<100	<100	Sensitivity only
31225 HGHLNDJ1 115 31262 CACHE J2 115 1 1	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	<100	106	<100	<100	<100	Sensitivity Only
31236 FULTON 115 30430 FULTON 230 9 1	CORONA-LAKEVILLE 115KV [4311] & FULTON 230/115KV TB 4	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	101	<100	<100	<100	<100	SPS per 2017-2018 TPP Mitigation Plan
31236 FULTON 115 31238 MONROE1 115 1 1	FULTON 115KV [1630] & CORONA-LAKEVILLE 115KV [4311]	P6	N-1-1	110	117	128	<100	<100	119	<100	131	120	<100	<100	128	SPS per 2017-2018 TPP Mitigation Plan
31240 SNTA RSA 115 31242 STNY PTP 115 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	80	103	119	71	50	118	108	6	15	25	21	122	SPS per 2017-2018 TPP Mitigation Plan
31242 STNY PTP 115 31246 BELLVUE 115 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	82	105	121	73	52	120	110	7	13	27	19	124	SPS per 2017-2018 TPP Mitigation Plan
31246 BELLVUE 115 31248 PENNGRVE 115 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	108	133	151	102	71	151	139	15	6	45	13	154	SPS per 2017-2018 TPP Mitigation Plan
	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	<100	118	137	<100	<100	<100	<100	145	125	<100	<100	139	Operating Solution or SPS
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	111	115	129	39	30	111	80	123	118	69	27	128	Operating Solution or SPS
31248 PENNGRVE 115 31254 CORONA 115 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	112	138	157	106	75	158	144	17	5	47	12	160	SPS per 2017-2018 TPP Mitigation Plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	115	119	135	41	31	115	83	130	122	71	28	134	SPS per 2017-2018 TPP Mitigation Plan
31254 CORONA 115 31255 LAKEVLLE 115 1 1	FULTON 115KV - SECTION 2D & 1D	P2	Bus-tie Breaker	109	115	127	40	31	121	88	137	117	67	28	127	SPS per 2017-2018 TPP Mitigation Plan
	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	107	130	147	114	80	164	135	20	7	46	11	149	SPS per 2017-2018 TPP Mitigation Plan
	FULTON 115KV [1620] & FULTON 115KV [1630]	P6	N-1-1	114	120	134	<100	<100	121	<100	137	122	<100	<100	132	SPS per 2017-2018 TPP Mitigation Plan
	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	107	130	149	<100	<100	109	<100	159	136	<100	<100	151	SPS per 2017-2018 TPP Mitigation Plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	109	114	127	40	31	121	88	137	116	67	28	126	SPS per 2017-2018 TPP Mitigation Plan

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				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
31258 SONOMA 115 32564 PUEBLO 115 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	103	123	139	89	63	127	128	15	3	43	9	141	Protection Upgrade
31262 CACHE J2 115 31229 REDBUDJ2 115 1 1	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	<100	106	<100	<100	<100	Sensitivity Only
31265 STHELNJ1 115 32562 PUEBLOJT 115 1 1	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	89	89	115	22	16	67	44	79	93	40	13	116	Bus Upgrade
31300 MENDOCNO 60.0 31260 MNDCNO M 115 1 1	UKIAH-HOPLAND-CLOVERDALE 115KV [4050] & GYSR78TP 115/13.8KV TB 1	P6	N-1-1	<100	<100	<100	<100	<100	107	<100	<100	<100	<100	<100	<100	Operating Solution or SPS
31300 MENDOCNO 60.0 31330 UPPR LKE 60.0 1 1	KONOCTI 60KV [6861]	P1	N-1	70	118	140	24	33	73	51	139	124	42	31	140	Operating Solution or SPS
	EGLE RCK 115/60KV TB 1	P1	N-1	70	117	139	24	33	73	51	139	124	42	31	140	Operating Solution or SPS
	KONOCTI 60KV [6861] (KONOCTI6-EGLE RCK)	P2	Line Section w/o Fault	70	118	140	24	33	73	51	139	124	42	31	140	Operating Solution or SPS
	EGLE RCK 115KV SECTION MA	P2	Bus	68	117	149	17	28	72	48	143	122	36	27	150	Operating Solution or SPS
	GEYSR5-6 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	<100	<100	123	<100	<100	<100	<100	140	<100	<100	<100	123	Operating Solution or SPS
	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<100	100	<100	<100	<100	<100	<100	140	104	<100	<100	123	Operating Solution or SPS
31326 PHLO JCT 60.0 31336 HPLND JT 60.0 1 1	GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	114	122	134	<100	<100	<100	<100	<100	131	<100	<100	134	Operating Solution or SPS
31330 UPPR LKE 60.0 31332 HARTLEY 60.0 1 1	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	58	110	136	14	27	64	41	130	144	31	26	135	Disable automatics at and above a predetermined load
	GEYSER16 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<100	<100	115	<100	<100	<100	<100	131	<100	<100	<100	115	Operating Solution or SPS
31332 HARTLEY 60.0 31334 CLER LKE 60.0 1 1	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON GRANITE_HPLND JT & EGLE RCK 115/60KV TB 1	P6	N-1-1	132	135	121	<100	<100	<100	<100	<100	135	<100	<100	120	Operating Solution or SPS
31334 CLER LKE 60.0 31335 GRANITE 60.0 1 1	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	122	77	90	57	25	104	79	75	80	80	23	90	Project: Clear Lake - Hopland reconductoring In -service date: 2022
	POTTRVLY 2.40KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	<100	<100	<100	<100	<100	104	<100	<100	<100	<100	<100	<100	Operating Solution or SPS
	INDIAN V 9.11KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<100	<100	<100	<100	<100	103	<100	<100	<100	<100	<100	<100	Operating Solution or SPS
	MENDOCINO 60KV [7510] & KONOCTI 60KV [6861]	P6	N-1-1	141	<100	<100	<100	<100	<100	<100	129	<100	<100	<100	<100	Project: Clear Lake - Hopland reconductoring In -service date: 2022
	KONOCTI 60KV [6861] & MENDOCINO 60KV [7510]	P6	N-1-1	141	138	125	<100	<100	167	115	130	136	<100	<100	125	Operating Solution or SPS
	EGLE RCK 115/60KV TB 1 & MENDOCINO 60KV [7510]	P6	N-1-1	140	136	125	<100	<100	167	115	130	136	<100	<100	125	Operating Solution or SPS
31334 CLER LKE 60.0 31338 KONOCTI6 60.0 1 1	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	85	100	125	45	31	90	63	114	104	52	29	124	Disable automatics at and above a predetermined load
31335 GRANITE 60.0 31336 HPLND JT 60.0 1 1	KONOCTI 60KV [6861]	P1	N-1	120	76	87	50	21	103	76	76	79	75	18	87	Project: Clear Lake - Hopland reconductoring In -service date: 2022
	EGLE RCK 115/60KV TB 1	P1	N-1	120	76	86	50	21	103	76	76	79	75	19	87	Project: Clear Lake - Hopland reconductoring In -service date: 2022
	KONOCTI 60KV [6861] (KONOCTI6-EGLE RCK)	P2	Line Section w/o Fault	120	76	87	50	21	103	76	76	79	75	18	87	Project: Clear Lake - Hopland reconductoring In -service date: 2022

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	EGLERCK - MA 115KV & EGLERCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	122	77	90	57	25	104	79	75	80	80	23	90	Project: Clear Lake - Hopland reconductoring In -service date: 2022
	INDIAN V 9.11KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<100	<100	<100	<100	<100	103	<100	<100	<100	<100	<100	<100	Operating Solution or SPS
31336 HPLND JT 60.0 31370 CLVRDLJT 60.0 1 1	EAGLE ROCK 115KV [1470] & EGLERCK-FULTON-SILVERDO 115KV [0]	P6	N-1-1	<100	<100	<100	<100	105	<100	<100	<100	<100	<100	109	<100	Disable automatics at and above a predetermined load
	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	151	Diverge	Diverge	<100	<100	166	149	Diverge	Diverge	102	<100	Diverge	Operating Solution or SPS
	GEYSERS #17-FULTON & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	66	66	75	73	100	81	61	54	67	88	101	76	Sensitivity only
	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	69	69	78	82	109	89	63	56	70	91	110	78	Operating Solution or SPS
31338 KONOCTI6 60.0 31344 EGLERCK 60.0 1 1	EAGLE ROCK-REDBUD 115KV [1480] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	108	110	111	<100	<100	111	<100	111	113	<100	<100	111	Operating Solution or SPS
	REDBUD-HGHLNDJ1 115KV [0] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	108	110	111	<100	<100	111	<100	110	113	<100	<100	111	Operating Solution or SPS
31344 EGLERCK 60.0 31220 EGLERCK 115 1 1	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	<100	Diverge	Diverge	<100	<100	<100	<100	Diverge	Diverge	<100	<100	Diverge	Operating Solution or SPS
31366 MLNO JCT 60.0 31385 LAGUNATP 60.0 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	134	56	62	100	72	57	58	22	13	51	14	78	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	LAKEVILLE #2 60KV [7340] MOAS OPENED ON PETLMA A_LKVLE JT & LAKEVILLE 60KV [7350]	P6	N-1-1	Diverge	<100	<100	<100	<100	Diverge	Diverge	<100	<100	<100	<100	<100	Operating Solution or SPS
	LAKEVILLE 230/60KV TB 3 & LAKEVILLE 230/60KV TB 5	P6	N-1-1	236	<100	<100	<100	<100	251	181	<100	<100	<100	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	227	<100	<100	<100	<100	228	207	<100	<100	125	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
31370 CLVRDLJT 60.0 31374 GYSRJCT1 60.0 1 1	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	68	68	77	82	108	88	63	56	70	91	109	78	Operating Solution or SPS
31377 FCHMNTP2 60.0 31380 FTCH MTN 60.0 1 1	FULTON-WINDSOR #1 60KV [0]	P1	N-1	182	186	182	71	57	141	119	143	193	116	51	182	Operating Solution or SPS
	WINDSOR-FCHMNTP2 60KV [0] NO FAULT	P2	Line Section w/o Fault	105	107	102	37	24	75	70	73	113	58	20	102	Operating Solution or SPS
	WINDSOR 60KV SECTION 1D	P2	Bus	104	107	101	37	24	75	70	73	113	58	20	101	Operating Solution or SPS
	GEYSER12 13.80KV GEN UNIT 1 & FULTON-WINDSOR #1 60KV [0]	P3	G1/N1	146	149	147	<100	<100	141	119	144	155	<100	<100	147	Operating Solution or SPS
	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	84	89	111	71	59	91	93	42	41	61	39	113	Protection Upgrade
	EGLERCK-FULTON-SILVERDO 115KV [0] & FULTON-WINDSOR #1 60KV [0]	P6	N-1-1	147	150	148	<100	<100	143	120	145	156	<100	<100	148	Operating Solution or SPS
	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	<100	Diverge	Diverge	<100	<100	<100	128	Diverge	Diverge	<100	<100	Diverge	Operating Solution or SPS
31378 FULTON 60.0 32650 ST.HELNA 60.0 1 1	LAKEVILLE #1 60KV [7360]	P1	N-1	105	112	116	17	14	81	55	81	117	34	15	116	Operating Solution or SPS

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31379 HDSBGTP2 60.0 31377 FCHMNTP2 60.0 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	102	105	116	72	66	85	112	35	23	55	19	117	Protection Upgrade
31380 FTCH MTN 60.0 31381 HDSBGTP1 60.0 1 1	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	<100	Diverge	Diverge	<100	<100	<100	<100	Diverge	Diverge	<100	<100	Diverge	Operating Solution or SPS
31384 COTATI 60.0 31389 PETC_JCT 60.0 1 1	FULTON 230KV - MIDDLE BREAKER BAY 3	P2	Non-bus-tie Breaker	104	<100	<100	9	<100	79	53	<100	<100	36	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	108	<100	<100	8	<100	84	56	<100	<100	45	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	193	<100	<100	146	103	<100	<100	19	<100	78	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON-IGNACIO #1 & FULTON-LAKEVILLE LINES	P7	DCTL	123	<100	<100	50	<100	94	52	<100	<100	26	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
31384 COTATI 60.0 31391 SNMA TAP 60.0 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	129	60	68	96	68	62	63	19	12	46	11	70	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
31389 PETC_JCT 60.0 31390 PETLMA A 60.0 1 1	LAKEVILLE - 1D 60KV & LAKEVILLE LINE	P2	Non-bus-tie Breaker	106	81	86	19	17	84	59	65	83	48	13	85	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	130	0	0	97	68	0	0	13	0	53	0	0	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 60KV [6910] MOAS OPENED ON SNMA TAP_SNMALDFL & LAKEVILLE 60KV [7350]	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	106	<100	<100	<100	<100	Operating Solution or SPS
31390 PETLMA A 60.0 31394 LKVLE JT 60.0 1 1	SONMA LF 9.11KV GEN UNIT 1 & LAKEVILLE 60KV [7350]	P3	G1/N1	113	<100	<100	<100	<100	123	<100	<100	<100	<100	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	134	3	3	128	89	2	3	14	1	55	1	3	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
31391 SNMA TAP 60.0 31385 LAGUNATP 60.0 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	140	49	54	104	75	51	51	24	13	55	16	70	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	235	<100	<100	<100	<100	236	215	<100	<100	131	<100	<100	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
31392 LAKEVILLE 60.0 30435 LAKEVILE 230 3 1	FULTON 60KV [6910] MOAS OPENED ON SNMA TAP_SNMALDFL & LAKEVILE 230/60KV TB 5	P6	N-1-1	<100	<100	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	Non-BES Facility
31392 LAKEVILLE 60.0 31394 LKVLE JT 60.0 1 1	LAKEVILLE 60KV [7350]	P1	N-1	110	81	85	20	17	103	72	75	83	49	13	85	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan

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31572 LAKEVILLE 60.0 31574 LAKEVILLE 60.0 1 1	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	126	4	4	111	77	3	4	13	1	51	1	4	Project: Lakeville 60 kV Area Reinforcement In-service date: December 2021 Short term: Action plan
32562 PUEBLOJT 115 32564 PUEBLO 115 1 1	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	89	89	116	22	16	67	44	80	93	40	13	116	Bus Upgrade
	LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	90	90	112	22	16	67	45	77	94	41	13	112	Operating Solution or SPS
32568 IGNACIO 115 32574 SAN RAFL 115 1 1	IGNACIO 115KV [1860] MOAS OPENED ON IGNACIO_LS GLLNS	P1	N-1	100	104	87	23	16	99	70	63	108	48	12	87	Project: Ignacio Area Reinforcement In-service date: 2023
	IGNACIO 115KV [1860] (IGNACIO-LS GLLNS)	P2	Line Section w/o Fault	100	104	87	23	16	99	70	63	108	48	12	87	Project: Ignacio Area Reinforcement In-service date: 2023
	GEYSER16 13.80KV GEN UNIT 1 & IGNACIO 115KV [1860] MOAS OPENED ON IGNACIO_LS GLLNS	P3	G1/N1	<100	104	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	Project: Ignacio Area Reinforcement In-service date: 2023
	LAKEVILLE 230KV [4970] & IGNACIO 115KV [1860] MOAS OPENED ON IGNACIO_LS GLLNS	P6	N-1-1	<100	104	<100	<100	<100	<100	<100	<100	107	<100	<100	<100	Project: Ignacio Area Reinforcement In-service date: 2023
32618 NTRWJCT1 115 32020 JMSN JCT 115 1 1	NRTH TWR - 1D 115KV & NRTH TWR-SOBRANTE LINE	P2	Non-bus-tie Breaker	<100	87	Diverge	<100	28	<100	50	77	90	<100	27	Diverge	Disable automatics at and above a predetermined load
	NRTH TWR - 1D 115KV & NRTH TWR-MARTNZ D LINE	P2	Non-bus-tie Breaker	<100	87	Diverge	<100	28	<100	50	77	90	<100	27	Diverge	Disable automatics at and above a predetermined load
32655 TULCAY1 60.0 32662 TULCY JT 60.0 1 1	TULUCAY 60KV [8190]	P1	N-1	99	102	107	32	27	96	72	103	105	58	23	108	Operating Solution or SPS
	NAPA 60KV SECTION 1D	P2	Bus	100	102	108	32	27	97	72	103	105	58	23	108	Operating Solution or SPS
	SANTA FE 13.80KV GEN UNIT 1 & TULUCAY 60KV [8190]	P3	G1/N1	<100	<100	107	<100	<100	<100	<100	103	<100	<100	<100	108	Operating Solution or SPS
32656 NAPA 60.0 32662 TULCY JT 60.0 1 1	NAPA 60KV SECTION 1D	P2	Bus	95	98	102	29	24	93	67	99	100	54	21	103	Non-BES Facility
	GEYSER17 13.80KV GEN UNIT 1 & TULUCAY 60KV [8190]	P3	G1/N1	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	<100	103	Operating Solution or SPS
	IGNACIO 230KV [4920] & TULUCAY 60KV [8190]	P6	N-1-1	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	Operating Solution or SPS
	TULUCAY-NAPA #2 & BASALT #1 60 KV LINES	P7	DCTL	95	98	102	29	24	93	67	99	100	54	21	103	Operating Solution or SPS
32667 IG JCT 60.0 32678 SAN_RFLJ 60.0 1 1	IGNACIO-ALTO-SAUSALITO #2 & IGNACIO-ALTO-SAUSALITO #1 LINES	P7	DCTL	101	108	54	24	16	107	72	57	113	48	14	55	Project: Ignacio Area Reinforcement In-service date: 2023
32678 SAN_RFLJ 60.0 32680 GREENBRE 60.0 1 1	IGNACIO-ALTO-SAUSALITO #2 & IGNACIO-ALTO-SAUSALITO #1 LINES	P7	DCTL	100	108	54	24	16	96	65	57	113	47	14	55	Project: Ignacio Area Reinforcement In-service date: 2023

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
ALTO 60 kV	Base Case	P0	Base case	1.01	1.02	0.97	1.07	1.08	1.01	1.04	0.98	1.01	1.04	1.08	0.97	Load power factor correction and voltage support if needed
ALTOJT1 60 kV	Base Case	P0	Base case	1.01	1.02	0.97	1.07	1.08	1.01	1.04	0.98	1.01	1.04	1.08	0.97	Load power factor correction and voltage support if needed
ALTOJT2 60 kV	Base Case	P0	Base case	1.01	1.02	0.97	1.07	1.08	1.01	1.04	0.98	1.01	1.04	1.08	0.97	Load power factor correction and voltage support if needed
ANNAPOLS 60 kV	Base Case	P0	Base case	0.99	0.99	1.00	1.04	1.06	0.97	0.99	0.98	0.99	1.02	1.06	1.00	Load power factor correction and voltage support if needed
BAHIA 230 kV	Base Case	P0	Base case	1.01	1.02	0.97	1.06	1.05	1.00	1.02	1.00	1.01	1.02	1.06	0.97	Load power factor correction and voltage support if needed
BELLVUE 115 kV	Base Case	P0	Base case	1.04	1.06	1.00	1.07	1.07	1.06	1.05	1.01	1.06	1.05	1.06	1.00	Load power factor correction and voltage support if needed
BOLINAS 60 kV	Base Case	P0	Base case	1.04	1.05	0.98	1.09	1.09	1.03	1.06	1.00	1.04	1.06	1.09	0.98	Load power factor correction and voltage support if needed
CACHE J1 115 kV	Base Case	P0	Base case	1.05	1.04	1.02	1.09	1.07	1.04	1.06	1.04	1.03	1.06	1.07	1.02	Load power factor correction and voltage support if needed
CACHE J2 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.06	1.03	Load power factor correction and voltage support if needed
CALISTGA 60 kV	Base Case	P0	Base case	0.95	0.95	0.95	1.04	1.05	0.96	0.98	0.96	0.95	1.00	1.05	0.95	Load power factor correction and voltage support if needed
CALPELLA 115 kV	Base Case	P0	Base case	1.04	1.05	1.04	1.07	1.07	1.05	1.05	1.06	1.04	1.04	1.07	1.04	Load power factor correction and voltage support if needed
CARQUINZ 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.00	1.07	1.07	1.11	0.99	Load power factor correction and voltage support if needed
CLER LKE 60 kV	Base Case	P0	Base case	1.02	1.01	0.99	1.04	1.05	1.03	1.03	0.99	1.01	1.03	1.05	0.99	Load power factor correction and voltage support if needed
CLOVRDLE 115 kV	Base Case	P0	Base case	1.03	1.03	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.06	1.03	Load power factor correction and voltage support if needed
CRQNZTP1 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.00	1.07	1.07	1.11	0.99	Load power factor correction and voltage support if needed
CRQNZTP2 115 kV	Base Case	P0	Base case	1.00	1.01	0.96	1.08	1.08	0.99	1.03	0.97	1.00	1.03	1.08	0.96	Load power factor correction and voltage support if needed
EGLE RCK 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	Base Case	P0	Base case	1.05	1.05	1.05	1.05	1.06	1.06	1.05	1.05	1.06	1.04	1.06	1.05	Load power factor correction and voltage support if needed
ER_FTNJT 115 kV	Base Case	P0	Base case	1.05	1.06	1.01	1.09	1.08	1.06	1.06	1.02	1.06	1.06	1.08	1.01	Load power factor correction and voltage support if needed
ERFT5_25 115 kV	Base Case	P0	Base case	1.04	1.04	1.02	1.07	1.06	1.04	1.05	1.03	1.04	1.05	1.06	1.02	Load power factor correction and voltage support if needed
FORT RSS 60 kV	Base Case	P0	Base case	1.00	1.00	1.00	1.04	1.06	0.98	1.00	0.99	0.99	1.02	1.06	1.00	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
FULTON 115 kV	Base Case	P0	Base case	1.06	1.06	1.02	1.08	1.08	1.06	1.06	1.03	1.06	1.06	1.08	1.02	Load power factor correction and voltage support if needed
FULTON 60 kV	Base Case	P0	Base case	1.04	1.05	1.05	1.05	1.05	1.05	1.04	1.05	1.04	1.04	1.05	1.05	Load power factor correction and voltage support if needed
GARCIA 60 kV	Base Case	P0	Base case	1.04	1.04	1.04	1.05	1.05	1.04	1.05	1.04	1.04	1.05	1.05	1.04	Load power factor correction and voltage support if needed
GARCIA J 60 kV	Base Case	P0	Base case	1.04	1.04	1.04	1.05	1.05	1.04	1.05	1.04	1.04	1.05	1.05	1.04	Load power factor correction and voltage support if needed
GEYSERS34 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
GEYSERS56 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
GEYSR11 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
GRANITE 60 kV	Base Case	P0	Base case	1.02	1.02	1.00	1.05	1.05	1.03	1.04	1.00	1.02	1.03	1.06	1.00	Load power factor correction and voltage support if needed
GREENBRE 60 kV	Base Case	P0	Base case	1.01	1.02	0.98	1.07	1.08	1.00	1.03	0.99	1.01	1.04	1.08	0.98	Load power factor correction and voltage support if needed
GUALALA 60 kV	Base Case	P0	Base case	0.98	0.98	0.99	1.04	1.06	0.96	0.98	0.97	0.98	1.01	1.06	0.99	Load power factor correction and voltage support if needed
GYSR78TP 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
HIGHLAND 115 kV	Base Case	P0	Base case	1.04	1.04	1.02	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.02	Load power factor correction and voltage support if needed
HGHLNDJ1 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.05	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
HGHLNDJ2 115 kV	Base Case	P0	Base case	1.04	1.04	1.02	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.02	Load power factor correction and voltage support if needed
HGHWY J1 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.10	1.10	1.04	1.06	1.01	1.06	1.06	1.10	1.00	Load power factor correction and voltage support if needed
HGHWY J2 115 kV	Base Case	P0	Base case	1.01	1.02	0.96	1.08	1.09	0.99	1.03	0.97	1.01	1.03	1.09	0.96	Load power factor correction and voltage support if needed
HighWAY 115 kV	Base Case	P0	Base case	1.00	1.01	0.96	1.08	1.09	0.99	1.03	0.97	1.01	1.03	1.09	0.96	Load power factor correction and voltage support if needed
HOMEGRND 115 kV	Base Case	P0	Base case	1.04	1.04	1.02	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.02	Load power factor correction and voltage support if needed
HOMEPROC 115 kV	Base Case	P0	Base case	1.04	1.04	1.02	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.02	Load power factor correction and voltage support if needed
HOMSTKTP 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.03	Load power factor correction and voltage support if needed
HPLND JT 115 kV	Base Case	P0	Base case	1.03	1.03	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.06	1.03	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
HPLND JT 60 kV	Base Case	P0	Base case	1.03	1.03	1.03	1.05	1.06	1.04	1.04	1.04	1.03	1.03	1.06	1.03	Load power factor correction and voltage support if needed
IG JCT 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
IGNACIO 115 kV	Base Case	P0	Base case	1.05	1.05	1.01	1.09	1.09	1.04	1.06	1.02	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
IGNACO A 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
IGNACO B 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
INDIN VL 115 kV	Base Case	P0	Base case	1.06	1.05	1.03	1.09	1.08	1.05	1.07	1.05	1.04	1.07	1.08	1.03	Load power factor correction and voltage support if needed
JCPMPJCT 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.01	1.06	1.07	1.10	0.99	Load power factor correction and voltage support if needed
JMSCNPMP 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.01	1.06	1.07	1.10	0.99	Load power factor correction and voltage support if needed
KONOCI6 60 kV	Base Case	P0	Base case	1.03	1.04	1.02	1.06	1.06	1.05	1.05	1.02	1.04	1.03	1.07	1.02	Load power factor correction and voltage support if needed
LAKEVI&1 230 kV	Base Case	P0	Base case	1.02	1.02	0.99	1.05	1.05	1.02	1.03	1.01	1.01	1.02	1.05	0.99	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	Base Case	P0	Base case	1.02	1.03	1.01	1.06	1.07	1.06	1.05	1.01	1.04	1.03	1.07	1.01	Load power factor correction and voltage support if needed
LS GLLNS 115 kV	Base Case	P0	Base case	1.04	1.05	0.99	1.09	1.09	1.04	1.06	1.01	1.04	1.06	1.09	0.99	Load power factor correction and voltage support if needed
LUCERNE 115 kV	Base Case	P0	Base case	1.05	1.04	1.03	1.08	1.08	1.04	1.06	1.05	1.03	1.05	1.08	1.03	Load power factor correction and voltage support if needed
LUCERNJ1 115 kV	Base Case	P0	Base case	1.05	1.04	1.03	1.08	1.08	1.04	1.06	1.05	1.03	1.05	1.08	1.03	Load power factor correction and voltage support if needed
LUCERNJ2 115 kV	Base Case	P0	Base case	1.04	1.04	1.04	1.07	1.07	1.04	1.04	1.05	1.04	1.04	1.07	1.04	Load power factor correction and voltage support if needed
LWRLAKEJ 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.08	1.07	1.03	1.06	1.03	1.03	1.05	1.07	1.03	Load power factor correction and voltage support if needed
MENDOCNO 115 kV	Base Case	P0	Base case	1.05	1.05	1.04	1.07	1.07	1.06	1.05	1.06	1.04	1.05	1.07	1.04	Load power factor correction and voltage support if needed
MEYERS 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.00	1.07	1.07	1.11	0.99	Load power factor correction and voltage support if needed
MEYERTP1 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.00	1.07	1.07	1.11	0.99	Load power factor correction and voltage support if needed
MEYERTP2 115 kV	Base Case	P0	Base case	1.00	1.01	0.96	1.08	1.08	0.99	1.03	0.97	1.00	1.03	1.08	0.96	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	Base Case	P0	Base case	1.00	1.03	1.01	1.07	1.08	1.07	1.05	0.99	1.03	1.02	1.09	1.01	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MIRABEL 60 kV	Base Case	P0	Base case	1.03	1.03	1.04	1.05	1.05	1.03	1.03	1.03	1.03	1.04	1.05	1.03	Load power factor correction and voltage support if needed
MIRBELTP 60 kV	Base Case	P0	Base case	1.03	1.03	1.04	1.05	1.05	1.03	1.03	1.03	1.03	1.04	1.05	1.03	Load power factor correction and voltage support if needed
MNTCLOJ1 115 kV	Base Case	P0	Base case	1.04	1.05	1.01	1.07	1.07	1.04	1.05	1.02	1.05	1.05	1.07	1.01	Load power factor correction and voltage support if needed
MNTCLOJ2 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
MNTCLOPH 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
MOLINO 60 kV	Base Case	P0	Base case	1.02	1.01	1.02	1.04	1.05	1.02	1.02	1.01	1.01	1.03	1.05	1.01	Load power factor correction and voltage support if needed
MONROE1 115 kV	Base Case	P0	Base case	1.05	1.06	1.01	1.08	1.08	1.07	1.06	1.01	1.06	1.06	1.08	1.00	Load power factor correction and voltage support if needed
MONROE2 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.08	1.08	1.07	1.06	1.01	1.06	1.06	1.08	1.00	Load power factor correction and voltage support if needed
MONTCLLO 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
MONTE RO 60 kV	Base Case	P0	Base case	1.01	1.02	1.02	1.04	1.06	1.00	1.01	1.01	1.01	1.03	1.06	1.01	Load power factor correction and voltage support if needed
MPE 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
MPE TAP 115 kV	Base Case	P0	Base case	1.04	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.04	1.04	1.06	1.03	Load power factor correction and voltage support if needed
MREIS JC 115 kV	Base Case	P0	Base case	1.05	1.07	0.99	1.10	1.10	1.04	1.06	1.00	1.06	1.07	1.10	0.99	Load power factor correction and voltage support if needed
MTCLPHJ1 115 kV	Base Case	P0	Base case	1.04	1.05	1.01	1.07	1.07	1.04	1.05	1.02	1.05	1.05	1.07	1.01	Load power factor correction and voltage support if needed
MTCLPHJ2 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
NOVATO 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
NRTH TWR 115 kV	Base Case	P0	Base case	1.03	1.04	1.01	1.05	1.06	1.02	1.03	1.02	1.04	1.03	1.06	1.01	Load power factor correction and voltage support if needed
NTWR ALT 115 kV	Base Case	P0	Base case	1.00	1.01	0.96	1.08	1.08	0.99	1.03	0.97	1.01	1.03	1.08	0.96	Load power factor correction and voltage support if needed
NTWRJCT1 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.11	1.11	1.06	1.06	1.04	1.05	1.06	1.11	1.00	Load power factor correction and voltage support if needed
NTWRJCT2 115 kV	Base Case	P0	Base case	1.03	1.04	1.01	1.05	1.06	1.02	1.03	1.02	1.04	1.03	1.06	1.01	Load power factor correction and voltage support if needed
NVTO JCT 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
OLEMA 60 kV	Base Case	P0	Base case	1.04	1.04	0.97	1.09	1.09	1.02	1.05	0.99	1.04	1.06	1.09	0.97	Load power factor correction and voltage support if needed
PARKWAY 230 kV	Base Case	P0	Base case	1.01	1.01	0.97	1.06	1.06	1.00	1.02	0.99	1.00	1.02	1.06	0.97	Load power factor correction and voltage support if needed
PENNGRVE 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.06	1.06	1.05	1.04	1.02	1.05	1.04	1.06	1.00	Load power factor correction and voltage support if needed
PNT ARNA 60 kV	Base Case	P0	Base case	1.04	1.04	1.04	1.05	1.05	1.04	1.05	1.04	1.04	1.05	1.05	1.04	Load power factor correction and voltage support if needed
PUEBLO 115 kV	Base Case	P0	Base case	1.02	1.03	0.99	1.05	1.06	1.02	1.03	1.00	1.03	1.03	1.05	0.99	Load power factor correction and voltage support if needed
PUEBLOJT 115 kV	Base Case	P0	Base case	1.04	1.05	1.01	1.07	1.07	1.04	1.05	1.02	1.05	1.05	1.07	1.01	Load power factor correction and voltage support if needed
REDBUD 115 kV	Base Case	P0	Base case	1.03	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.07	1.03	Load power factor correction and voltage support if needed
REDBUDJ1 115 kV	Base Case	P0	Base case	1.03	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.07	1.03	Load power factor correction and voltage support if needed
REDBUDJ2 115 kV	Base Case	P0	Base case	1.03	1.04	1.03	1.06	1.06	1.04	1.04	1.04	1.03	1.04	1.07	1.03	Load power factor correction and voltage support if needed
RINCON 115 kV	Base Case	P0	Base case	1.05	1.06	1.01	1.09	1.08	1.06	1.06	1.02	1.06	1.06	1.08	1.01	Load power factor correction and voltage support if needed
RINCONJ1 115 kV	Base Case	P0	Base case	1.05	1.06	1.02	1.08	1.08	1.06	1.06	1.02	1.06	1.06	1.08	1.01	Load power factor correction and voltage support if needed
RINCONJ2 115 kV	Base Case	P0	Base case	1.05	1.06	1.01	1.09	1.08	1.06	1.06	1.02	1.06	1.06	1.08	1.01	Load power factor correction and voltage support if needed
SAN RAFL 115 kV	Base Case	P0	Base case	1.04	1.05	0.99	1.09	1.09	1.03	1.06	1.00	1.04	1.06	1.09	0.99	Load power factor correction and voltage support if needed
SAN_RFLJ 60 kV	Base Case	P0	Base case	1.02	1.02	0.99	1.08	1.08	1.01	1.04	1.00	1.02	1.04	1.08	0.98	Load power factor correction and voltage support if needed
SAUSALTO 60 kV	Base Case	P0	Base case	1.01	1.01	0.96	1.07	1.07	1.00	1.03	0.97	1.00	1.04	1.08	0.96	Load power factor correction and voltage support if needed
SILVERDO 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.08	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
SILVRDJ1 115 kV	Base Case	P0	Base case	1.04	1.05	1.01	1.07	1.07	1.04	1.05	1.02	1.05	1.05	1.07	1.01	Load power factor correction and voltage support if needed
SILVRDJ2 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.08	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
SKAGGS 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
SKGGS J1 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.09	1.09	1.04	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
SKGGS J2 115 kV	Base Case	P0	Base case	1.02	1.03	0.98	1.09	1.09	1.01	1.04	0.99	1.02	1.04	1.09	0.98	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
SLMN CRK 60 kV	Base Case	P0	Base case	0.99	1.00	1.00	1.04	1.06	0.98	1.00	0.99	0.99	1.02	1.06	1.00	Load power factor correction and voltage support if needed
SLMN JCT 60 kV	Base Case	P0	Base case	1.00	1.00	1.01	1.04	1.06	0.99	1.00	1.00	1.00	1.02	1.06	1.01	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.08	1.08	1.07	1.06	1.01	1.06	1.06	1.08	1.00	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	Base Case	P0	Base case	0.99	1.00	1.00	1.04	1.05	1.00	1.01	1.00	0.99	1.02	1.05	1.00	Load power factor correction and voltage support if needed
STAF_JCT 60 kV	Base Case	P0	Base case	1.05	1.05	0.98	1.09	1.09	1.03	1.06	0.99	1.05	1.07	1.09	0.98	Load power factor correction and voltage support if needed
STAFFORD 60 kV	Base Case	P0	Base case	1.05	1.05	0.98	1.09	1.09	1.03	1.06	0.99	1.05	1.07	1.09	0.98	Load power factor correction and voltage support if needed
STHELNJ1 115 kV	Base Case	P0	Base case	1.04	1.05	1.01	1.07	1.07	1.04	1.05	1.02	1.05	1.05	1.07	1.01	Load power factor correction and voltage support if needed
STHELNJ2 115 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.08	1.06	1.06	1.01	1.05	1.06	1.09	1.00	Load power factor correction and voltage support if needed
STNY PTP 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.07	1.07	1.06	1.05	1.01	1.06	1.05	1.07	1.00	Load power factor correction and voltage support if needed
STONY PT 115 kV	Base Case	P0	Base case	1.05	1.06	1.00	1.07	1.07	1.06	1.05	1.01	1.06	1.05	1.07	1.00	Load power factor correction and voltage support if needed
TOCA_JCT 60 kV	Base Case	P0	Base case	1.04	1.05	0.98	1.09	1.09	1.02	1.06	0.99	1.04	1.06	1.09	0.98	Load power factor correction and voltage support if needed
TOCALOMA 60 kV	Base Case	P0	Base case	1.04	1.05	0.98	1.09	1.09	1.02	1.06	0.99	1.04	1.06	1.09	0.98	Load power factor correction and voltage support if needed
TRNTN JT 60 kV	Base Case	P0	Base case	1.03	1.04	1.04	1.05	1.05	1.03	1.03	1.04	1.04	1.04	1.05	1.04	Load power factor correction and voltage support if needed
TRNTN_JC 60 kV	Base Case	P0	Base case	1.03	1.04	1.04	1.05	1.05	1.03	1.03	1.04	1.04	1.04	1.05	1.04	Load power factor correction and voltage support if needed
TULUCA&1 230 kV	Base Case	P0	Base case	1.01	1.02	0.99	1.05	1.05	1.02	1.02	1.01	1.01	1.02	1.05	0.99	Load power factor correction and voltage support if needed
TULUCAY 230 kV	Base Case	P0	Base case	1.01	1.02	0.99	1.05	1.05	1.01	1.02	1.01	1.01	1.02	1.05	0.99	Load power factor correction and voltage support if needed
TWR2_19 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.08	1.03	1.05	1.01	1.04	1.06	1.08	1.00	Load power factor correction and voltage support if needed
TWR2_20 60 kV	Base Case	P0	Base case	1.04	1.05	1.00	1.09	1.08	1.03	1.05	1.01	1.04	1.06	1.08	1.00	Load power factor correction and voltage support if needed
UKIAH 115 kV	Base Case	P0	Base case	1.03	1.04	1.03	1.06	1.06	1.05	1.04	1.05	1.03	1.04	1.07	1.03	Load power factor correction and voltage support if needed
WHLR JCT 60 kV	Base Case	P0	Base case	1.03	1.03	1.04	1.05	1.05	1.03	1.03	1.03	1.03	1.04	1.05	1.03	Load power factor correction and voltage support if needed
WHLR TAP 60 kV	Base Case	P0	Base case	1.03	1.04	1.04	1.05	1.05	1.03	1.03	1.04	1.04	1.04	1.05	1.04	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
WOHLER 60 kV	Base Case	P0	Base case	1.03	1.04	1.04	1.05	1.05	1.03	1.03	1.04	1.03	1.04	1.05	1.04	Load power factor correction and voltage support if needed
WOODACRE 60 kV	Base Case	P0	Base case	1.04	1.05	0.99	1.09	1.09	1.03	1.05	1.00	1.04	1.06	1.09	0.99	Load power factor correction and voltage support if needed
ALTO 60kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	1.00	1.10	1.10	1.03	1.06	1.00	1.03	1.06	1.10	0.99	Switch off cap bank at Greenbrae
ALTOJT1 60kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	1.00	1.10	1.10	1.03	1.06	1.00	1.03	1.06	1.10	0.99	Switch off cap bank at Greenbrae
ALTOJT2 60kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	1.00	1.10	1.10	1.03	1.06	1.01	1.03	1.06	1.10	1.00	Switch off cap bank at Greenbrae
BOLINAS 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.01	1.12	1.12	1.05	1.07	1.02	1.06	1.08	1.12	1.00	Switch off cap bank at Greenbrae
CALISTGA 60kV	LAKEVILLE #1 60KV [7360]	P1	N-1	0.88	0.87	0.86	1.04	1.06	0.87	0.93	0.87	0.86	0.99	1.07	0.86	Project: Fulton 230/115 kv Bank alternative In-service date: 2023 Short Term: Open line between Cotatiand Petaluma Long Term: Continue to monitor future load forecast
CARQUINZ 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.13	1.13	1.06	1.08	1.02	1.09	1.09	1.13	1.01	Switch off cap bank at Greenbrae
CLER LKE 60kV	KONOCTI 60KV [6861]	P1	N-1	0.95	0.89	0.78	1.04	1.06	0.97	1.00	0.72	0.87	1.00	1.06	0.77	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
CLER LKE 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.95	0.89	0.78	1.04	1.06	0.97	1.00	0.72	0.87	1.00	1.06	0.78	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
CORONA 115kV	CORONA-LAKEVILLE 115KV [4311]	P1	N-1	1.06	1.08	0.96	1.10	1.10	1.07	1.07	0.97	1.08	1.08	1.10	0.96	Add reactor
CRQNZTP1 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.13	1.13	1.06	1.08	1.02	1.08	1.09	1.13	1.01	Switch off cap bank at Greenbrae
CRQNZTP2 115kV	IGNACIO SVD=R	P1	N-1	1.02	1.03	0.98	1.11	1.11	1.02	1.05	0.99	1.03	1.05	1.11	0.98	Switch off cap bank at Greenbrae
DUNBAR 60kV	LAKEVILLE #1 60KV [7360]	P1	N-1	0.90	0.89	0.88	1.05	1.07	0.88	0.95	0.89	0.88	1.00	1.08	0.88	Project: Fulton 230/115 kv Bank alternative In-service date: 2023 Short Term: Open line between Cotatiand Petaluma Long Term: Continue to monitor future load forecast
EGLE RCK 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.91	0.86	0.70	1.05	1.07	0.95	0.99	0.62	0.83	0.98	1.08	0.70	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
GRANITE 60kV	KONOCTI 60KV [6861]	P1	N-1	0.96	0.91	0.83	1.04	1.06	0.98	1.01	0.78	0.90	1.00	1.06	0.83	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
GRANITE 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.96	0.91	0.83	1.04	1.06	0.98	1.01	0.78	0.90	1.00	1.06	0.83	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
GREENBRE 60kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	1.00	1.10	1.10	1.03	1.05	1.01	1.03	1.06	1.10	1.00	Switch off cap bank at Greenbrae
HARTLEY 60kV	KONOCTI 60KV [6861]	P1	N-1	0.96	0.90	0.80	1.03	1.05	0.97	1.00	0.75	0.89	1.00	1.05	0.80	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
HARTLEY 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.96	0.90	0.80	1.03	1.05	0.97	1.00	0.76	0.89	1.00	1.06	0.80	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
HGHWY J1 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.08	1.02	1.12	1.12	1.06	1.08	1.03	1.08	1.08	1.12	1.02	Switch off cap bank at Greenbrae
HGHWY J2 115kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	0.98	1.11	1.11	1.02	1.05	0.99	1.03	1.05	1.11	0.98	Switch off cap bank at Greenbrae
HighWAY 115kV	IGNACIO SVD=R	P1	N-1	1.03	1.04	0.98	1.11	1.11	1.02	1.05	0.99	1.03	1.05	1.11	0.98	Switch off cap bank at Greenbrae
IG JCT 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.08	1.03	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
IGNACIO 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.07	1.03	1.11	1.11	1.07	1.08	1.04	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
IGNACO A 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.08	1.03	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
IGNACO B 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.08	1.03	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
JCPMPJCT 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.12	1.13	1.06	1.08	1.03	1.08	1.09	1.13	1.01	Switch off cap bank at Greenbrae
JMSCNPMP 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.12	1.13	1.06	1.08	1.03	1.08	1.09	1.13	1.01	Switch off cap bank at Greenbrae
KONOCTI6 60kV	KONOCTI 60KV [6861]	P1	N-1	0.91	0.86	0.70	1.05	1.07	0.95	0.99	0.62	0.83	0.97	1.08	0.69	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
KONOCTI6 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.91	0.86	0.70	1.05	1.07	0.95	0.99	0.62	0.83	0.98	1.08	0.70	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
LOWR LKE 60kV	KONOCTI 60KV [6861]	P1	N-1	0.89	0.86	0.67	1.06	1.08	0.96	0.99	0.59	0.83	0.97	1.08	0.67	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
LOWR LKE 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.89	0.86	0.67	1.06	1.07	0.96	0.99	0.59	0.83	0.97	1.09	0.67	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
LS GLLNS 115kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.01	1.11	1.11	1.06	1.08	1.03	1.06	1.08	1.11	1.01	Switch off cap bank at Greenbrae
MEYERS 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.13	1.13	1.06	1.08	1.02	1.09	1.09	1.13	1.01	Switch off cap bank at Greenbrae
MEYERTP1 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.13	1.13	1.06	1.08	1.02	1.09	1.09	1.13	1.01	Switch off cap bank at Greenbrae
MEYERTP2 115kV	IGNACIO SVD=R	P1	N-1	1.02	1.03	0.98	1.11	1.11	1.02	1.05	0.99	1.03	1.05	1.11	0.98	Switch off cap bank at Greenbrae

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MIDDLTWN 60kV	KONOC TI 60KV [6861]	P1	N-1	0.87	0.86	0.63	1.06	1.09	0.97	0.99	0.54	0.83	0.96	1.10	0.63	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
MIDDLTWN 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.87	0.86	0.63	1.06	1.09	0.97	0.99	0.54	0.83	0.96	1.10	0.63	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
MREIS JC 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.09	1.01	1.13	1.13	1.06	1.08	1.02	1.08	1.09	1.13	1.01	Switch off cap bank at Greenbrae
NOVATO 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.08	1.03	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
NTWR ALT 115kV	IGNACIO SVD=R	P1	N-1	1.02	1.03	0.98	1.11	1.11	1.02	1.05	0.99	1.03	1.05	1.11	0.98	Switch off cap bank at Greenbrae
NVTO JCT 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.08	1.03	1.07	1.08	1.11	1.02	Switch off cap bank at Greenbrae
OLEMA 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.06	1.00	1.11	1.12	1.05	1.07	1.01	1.06	1.08	1.12	0.99	Switch off cap bank at Greenbrae
SAN RAFL 115kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.01	1.11	1.11	1.06	1.07	1.03	1.06	1.08	1.11	1.01	Switch off cap bank at Greenbrae
SAN_RFLJ 60kV	IGNACIO SVD=R	P1	N-1	1.04	1.04	1.01	1.10	1.10	1.04	1.06	1.02	1.04	1.06	1.11	1.01	Switch off cap bank at Greenbrae
SAUSALTO 60kV	IGNACIO SVD=R	P1	N-1	1.03	1.03	0.99	1.10	1.10	1.02	1.05	0.99	1.03	1.06	1.10	0.99	Switch off cap bank at Greenbrae
SKAGGS 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.08	1.02	1.12	1.12	1.07	1.08	1.03	1.07	1.08	1.12	1.02	Switch off cap bank at Greenbrae
SKGGS J1 115kV	IGNACIO SVD=R	P1	N-1	1.07	1.08	1.02	1.12	1.12	1.07	1.08	1.03	1.07	1.08	1.12	1.02	Switch off cap bank at Greenbrae
SKGGS J2 115kV	IGNACIO SVD=R	P1	N-1	1.04	1.05	1.00	1.11	1.11	1.04	1.06	1.01	1.04	1.06	1.11	1.00	Switch off cap bank at Greenbrae
STAF_JCT 60kV	IGNACIO SVD=R	P1	N-1	1.07	1.07	1.00	1.12	1.12	1.05	1.08	1.01	1.07	1.09	1.12	1.00	Switch off cap bank at Greenbrae
STAFFORD 60kV	IGNACIO SVD=R	P1	N-1	1.07	1.07	1.00	1.12	1.12	1.05	1.08	1.01	1.07	1.09	1.12	1.00	Switch off cap bank at Greenbrae
TOCA_JCT 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.00	1.12	1.12	1.05	1.08	1.01	1.06	1.08	1.12	1.00	Switch off cap bank at Greenbrae
TOCALOMA 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.00	1.12	1.12	1.05	1.08	1.01	1.06	1.08	1.12	1.00	Switch off cap bank at Greenbrae
TWR2_19 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.07	1.03	1.06	1.08	1.11	1.02	Switch off cap bank at Greenbrae
TWR2_20 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.02	1.11	1.11	1.06	1.07	1.03	1.06	1.08	1.11	1.02	Switch off cap bank at Greenbrae
UPPR LKE 60kV	KONOC TI 60KV [6861]	P1	N-1	0.97	0.92	0.85	1.03	1.04	0.97	1.00	0.81	0.91	1.00	1.04	0.85	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
UPPR LKE 60kV	EGLE RCK 115/60KV TB 1	P1	N-1	0.97	0.92	0.85	1.03	1.04	0.98	1.00	0.81	0.91	1.00	1.05	0.85	Short Term: Middletown UVLS Long Term: Instsall a new 115/60 kV bank at Middletown Sub or increase the planned voltage support (10-15MVAR) at Middle Town
WOODACRE 60kV	IGNACIO SVD=R	P1	N-1	1.06	1.07	1.01	1.11	1.11	1.06	1.07	1.02	1.06	1.08	1.12	1.01	Switch off cap bank at Greenbrae
ALTO 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.03	1.03	0.98	1.05	0.99	1.10	1.10	1.02	1.03	1.06	1.10	0.98	Switch off cap bank at Greenbrae
BELLVUE 115 kV	LAKEV LLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	1.05	1.07	0.94	1.07	0.95	1.10	1.10	1.06	1.07	1.08	1.10	0.94	Load power factor correction and voltage support if needed
BELLVUE 115 kV	FULTON 115KV - SECTION 2D & 1D	P2	Bus-tie Breaker	0.99	1.02	0.88	1.01	0.87	1.03	1.04	1.04	1.02	1.02	1.04	0.88	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.03	1.03	0.93	1.03	0.97	1.03	1.03	1.03	0.86	1.03	1.03	0.92	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BOLINAS 60 kV	IGNACIO 60KV [7180] (IGNACO B-STAF_JCT)	P2	Line Section w/o Fault	1.00	0.99	0.85	1.03	0.86	1.09	1.09	0.94	0.98	1.06	1.10	0.85	Load power factor correction and voltage support if needed
BOLINAS 60 kV	IGNACIO 60KV [7140] (IGNACO B-WOODACRE)	P2	Line Section w/o Fault	0.98	0.97	0.89	1.01	0.87	1.09	1.10	0.94	0.96	1.05	1.11	0.87	Load power factor correction and voltage support if needed
BOLINAS 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.05	1.06	0.99	1.07	1.01	1.12	1.12	1.04	1.05	1.08	1.12	0.99	Switch off cap bank at Greenbrae
CALISTGA 60 kV	LAKEVILLE - 2D 60KV & LAKEVILLE #1 LINE	P2	Non-bus-tie Breaker	0.87	0.87	0.86	0.93	0.87	1.04	1.06	0.87	0.86	0.99	1.07	0.86	Load power factor correction and voltage support if needed
CALPELLA 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	0.97	0.82	1.03	0.86	1.07	1.06	1.00	0.81	1.00	1.07	0.82	Middletown UVLS
CLER LKE 60 kV	KONOCTI 60KV [6861] (KONOCTI6-EGLE RCK)	P2	Line Section w/o Fault	0.95	0.89	0.78	1.00	0.72	1.04	1.06	0.97	0.87	1.00	1.06	0.77	Middletown UVLS
CLER LKE 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.95	0.88	0.72	0.99	0.70	1.04	1.06	0.97	0.88	0.99	1.06	0.72	Middletown UVLS
CLER LKE 60 kV	KONOCTI6 60KV SECTION 1E	P2	Bus	0.96	0.94	0.85	1.01	0.80	1.04	1.05	0.98	0.93	1.00	1.06	0.86	Middletown UVLS
CLER LKE 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.95	0.89	0.78	1.00	0.72	1.04	1.06	0.97	0.87	1.00	1.06	0.77	Middletown UVLS
CLER LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.94	0.87	0.62	1.00	0.62	1.04	1.06	0.95	0.63	0.98	1.06	0.61	Middletown UVLS
CLER LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.95	0.88	0.72	0.99	0.70	1.04	1.06	0.97	0.88	0.99	1.06	0.72	Middletown UVLS
CLER LKE 60 kV	EGLE RCK - MA 115KV & EAGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.95	0.88	0.72	0.99	0.70	1.04	1.06	0.97	0.88	0.99	1.06	0.72	Middletown UVLS
CLER LKE 60 kV	KONOCTI6 - 1E 60KV & KONOCTI LINE	P2	Non-bus-tie Breaker	0.96	0.94	0.85	1.01	0.80	1.04	1.05	0.98	0.93	1.00	1.06	0.86	Middletown UVLS
CORONA 115 kV	LAKEVILLE 115KV SECTION 1D	P2	Bus	1.06	1.08	0.96	1.07	0.97	1.10	1.10	1.07	1.08	1.08	1.10	0.96	Switch off cap bank at Middletown
CORONA 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	1.05	1.08	0.93	1.07	0.94	1.11	1.11	1.06	1.07	1.08	1.11	0.93	Load power factor correction and voltage support if needed
COVELO6 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.98	0.97	0.81	1.01	0.89	1.02	1.03	1.01	0.82	1.01	1.03	0.81	Middletown UVLS
DUNBAR 60 kV	LAKEVILLE - 2D 60KV & LAKEVILLE #1 LINE	P2	Non-bus-tie Breaker	0.90	0.89	0.88	0.95	0.89	1.05	1.07	0.88	0.88	1.00	1.08	0.88	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.91	0.85	0.63	0.98	0.59	1.05	1.07	0.95	0.84	0.97	1.08	0.63	Middletown UVLS
EGLE RCK 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.90	0.83	0.54	0.99	0.53	1.05	1.07	0.93	0.56	0.96	1.08	0.54	Middletown UVLS
EGLE RCK 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.91	0.85	0.63	0.98	0.59	1.05	1.07	0.95	0.84	0.97	1.08	0.63	Middletown UVLS
EGLE RCK 60 kV	EGLE RCK - MA 115KV & EAGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.91	0.85	0.63	0.98	0.59	1.05	1.07	0.95	0.84	0.97	1.08	0.63	Middletown UVLS
ELK 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.03	1.03	0.91	1.04	0.95	1.04	1.05	1.02	0.86	1.04	1.05	0.91	Middletown UVLS
FRT BRGG 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.02	1.01	0.90	1.02	0.94	1.03	1.03	1.02	0.84	1.02	1.03	0.90	Middletown UVLS
GARCIA 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.03	1.03	0.92	1.04	0.95	1.04	1.05	1.03	0.86	1.04	1.05	0.91	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
GRANITE 60 kV	KONOCI6 60KV [6861] (KONOCI6-EGLE RCK)	P2	Line Section w/o Fault	0.96	0.91	0.83	1.01	0.78	1.04	1.06	0.98	0.90	1.00	1.06	0.83	Middletown UVLS
GRANITE 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.96	0.90	0.77	1.00	0.75	1.04	1.06	0.98	0.90	1.00	1.06	0.77	Middletown UVLS
GRANITE 60 kV	KONOCI6 60KV SECTION 1E	P2	Bus	0.98	0.95	0.89	1.01	0.85	1.04	1.05	1.00	0.94	1.01	1.06	0.89	Middletown UVLS
GRANITE 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.96	0.91	0.83	1.01	0.78	1.04	1.06	0.98	0.90	1.00	1.06	0.83	Middletown UVLS
GRANITE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.95	0.89	0.67	1.00	0.68	1.04	1.05	0.96	0.67	0.99	1.06	0.67	Middletown UVLS
GRANITE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.96	0.90	0.77	1.00	0.75	1.04	1.06	0.98	0.90	1.00	1.06	0.77	Middletown UVLS
GRANITE 60 kV	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.96	0.90	0.77	1.00	0.75	1.04	1.06	0.98	0.90	1.00	1.06	0.77	Middletown UVLS
GRANITE 60 kV	KONOCI6 - 1E 60KV & KONOCI LINE	P2	Non-bus-tie Breaker	0.98	0.95	0.89	1.01	0.85	1.04	1.05	1.00	0.94	1.01	1.06	0.89	Middletown UVLS
GREENBRE 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.02	1.03	0.99	1.05	1.00	1.10	1.10	1.02	1.02	1.06	1.10	0.99	Switch off cap bank at Greenbrae
HARTLEY 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.96	0.89	0.75	0.99	0.73	1.03	1.05	0.97	0.89	0.99	1.06	0.75	Middletown UVLS
HARTLEY 60 kV	KONOCI6 60KV SECTION 1E	P2	Bus	0.97	0.94	0.87	1.00	0.82	1.03	1.05	0.99	0.93	1.00	1.05	0.87	Middletown UVLS
HARTLEY 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.96	0.90	0.80	1.00	0.75	1.03	1.05	0.97	0.89	1.00	1.05	0.80	Middletown UVLS
HARTLEY 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.95	0.88	0.64	1.00	0.65	1.03	1.05	0.96	0.66	0.99	1.06	0.64	Middletown UVLS
HARTLEY 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.96	0.89	0.75	0.99	0.73	1.03	1.05	0.97	0.89	0.99	1.06	0.75	Middletown UVLS
HARTLEY 60 kV	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.96	0.89	0.75	0.99	0.73	1.03	1.05	0.97	0.89	0.99	1.05	0.75	Middletown UVLS
HARTLEY 60 kV	KONOCI6 - 1E 60KV & KONOCI LINE	P2	Non-bus-tie Breaker	0.97	0.94	0.87	1.00	0.82	1.03	1.05	0.99	0.93	1.00	1.05	0.87	Middletown UVLS
HIGHLAND 115 kV	EAGLE ROCK 115KV [1470] (EGLE RCK-LWRLAKEJ)	P2	Line Section w/o Fault	1.05	1.03	1.01	1.08	1.03	1.13	1.09	1.02	1.02	1.07	1.09	1.01	Switch off cap bank at Middletown
HIGHLAND 115 kV	EGLE RCK 115KV SECTION MA	P2	Bus	1.05	1.02	0.98	1.08	1.01	1.13	1.09	1.02	1.02	1.07	1.09	0.98	Switch off cap bank at Middletown
HIGHLAND 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.95	0.89	0.75	0.99	0.79	1.09	1.05	0.89	0.71	0.95	1.06	0.75	Middletown UVLS
HIGHLAND 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	1.05	1.02	0.98	1.08	1.01	1.13	1.09	1.01	1.01	1.07	1.09	0.98	Switch off cap bank at Middletown
HIGHLAND 115 kV	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	1.05	1.02	0.98	1.08	1.01	1.13	1.09	1.02	1.02	1.07	1.09	0.98	Switch off cap bank at Middletown
HighWAY 115 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.02	1.03	0.97	1.04	0.98	1.11	1.11	1.01	1.02	1.05	1.11	0.97	Switch off cap bank at Greenbrae
HPLND JT 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.00	0.97	0.86	1.03	0.89	1.05	1.05	1.00	0.84	1.01	1.06	0.86	Middletown UVLS
IGNACIO 115 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.07	1.01	1.07	1.03	1.11	1.11	1.06	1.06	1.07	1.11	1.01	Switch off cap bank at Greenbrae
IGNACO A 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.06	1.01	1.07	1.02	1.11	1.11	1.05	1.06	1.07	1.11	1.01	Switch off cap bank at Greenbrae
IGNACO B 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.07	1.01	1.07	1.02	1.11	1.11	1.05	1.06	1.07	1.11	1.01	Switch off cap bank at Greenbrae
KONOCI6 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.91	0.85	0.63	0.98	0.59	1.05	1.07	0.95	0.84	0.97	1.08	0.63	Middletown UVLS
KONOCI6 60 kV	KONOCI6 60KV SECTION 1E	P2	Bus	0.93	0.93	0.81	1.00	0.74	1.04	1.06	0.98	0.91	0.99	1.07	0.82	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
KONOCI6 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.90	0.83	0.54	0.99	0.53	1.05	1.07	0.93	0.56	0.96	1.08	0.54	Middletown UVLS
KONOCI6 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.91	0.85	0.63	0.98	0.59	1.05	1.07	0.95	0.84	0.97	1.08	0.63	Middletown UVLS
KONOCI6 60 kV	KONOCI6 60KV - SECTION 1D & 1E	P2	Bus-tie Breaker	0.99	0.94	0.90	1.01	0.90	1.03	1.04	0.98	0.94	1.01	1.04	0.91	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	KONOCI6 60KV [6861] (KONOCI6-EGLE RCK)	P2	Line Section w/o Fault	0.89	0.86	0.67	0.99	0.59	1.06	1.08	0.96	0.83	0.97	1.08	0.67	Middletown UVLS
LOWR LKE 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.89	0.85	0.60	0.98	0.56	1.06	1.08	0.96	0.84	0.96	1.09	0.60	Middletown UVLS
LOWR LKE 60 kV	KONOCI6 60KV SECTION 1E	P2	Bus	0.92	0.93	0.80	1.00	0.70	1.05	1.07	0.98	0.91	0.98	1.08	0.80	Middletown UVLS
LOWR LKE 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.89	0.86	0.67	0.99	0.59	1.06	1.08	0.96	0.83	0.97	1.08	0.67	Middletown UVLS
LOWR LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.88	0.83	0.51	0.99	0.50	1.06	1.08	0.94	0.55	0.96	1.09	0.51	Middletown UVLS
LOWR LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.89	0.85	0.60	0.98	0.56	1.06	1.08	0.96	0.84	0.96	1.09	0.60	Middletown UVLS
LOWR LKE 60 kV	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.89	0.85	0.60	0.98	0.56	1.06	1.08	0.96	0.84	0.96	1.09	0.60	Middletown UVLS
LOWR LKE 60 kV	KONOCI6 - 1E 60KV & KONOCI6 LINE	P2	Non-bus-tie Breaker	0.92	0.93	0.80	1.00	0.70	1.05	1.07	0.98	0.91	0.98	1.08	0.80	Middletown UVLS
LUCERNE 115 kV	MENDOCNO 115KV SECTION 1D	P2	Bus	1.05	1.04	1.04	1.09	1.02	1.12	1.11	1.04	1.02	1.09	1.11	1.04	Switch off cap bank at Middletown
LUCERNE 115 kV	MENDOCNO - 1D 115KV & MENDOCINO LINE	P2	Non-bus-tie Breaker	1.05	1.04	1.04	1.09	1.02	1.12	1.11	1.04	1.02	1.09	1.11	1.04	Switch off cap bank at Middletown
LUCERNE 115 kV	MENDOCNO - 1D 115KV & MENDOCINO LINE (2)	P2	Non-bus-tie Breaker	1.05	1.04	1.04	1.09	1.02	1.12	1.11	1.04	1.02	1.09	1.11	1.04	Switch off cap bank at Middletown
LUCERNE 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	0.96	0.84	1.04	0.89	1.09	1.08	0.98	0.83	1.03	1.08	0.84	Middletown UVLS
LYTNVLE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.99	0.97	0.82	1.01	0.90	1.02	1.03	1.01	0.83	1.01	1.03	0.82	Middletown UVLS
LYTNVLE 60 kV	MENDOCNO - MA 60KV & MENDOCINO LINE (2)_Dup1	P2	Non-bus-tie Breaker	1.03	1.01	0.95	1.03	0.80	1.03	1.02	1.03	1.01	1.04	1.03	0.96	Middletown UVLS
MENDOCNO 115 kV	MENDOCNO 115KV SECTION 1D	P2	Bus	1.05	1.05	1.06	1.10	1.02	1.13	1.13	1.06	1.03	1.10	1.13	1.06	Switch off cap bank at Middletown
MENDOCNO 115 kV	MENDOCNO - 1D 115KV & MENDOCINO LINE	P2	Non-bus-tie Breaker	1.05	1.05	1.06	1.10	1.02	1.13	1.13	1.06	1.03	1.10	1.13	1.06	Switch off cap bank at Middletown
MENDOCNO 115 kV	MENDOCNO - 1D 115KV & MENDOCINO LINE (2)	P2	Non-bus-tie Breaker	1.05	1.05	1.06	1.10	1.02	1.13	1.13	1.06	1.03	1.10	1.13	1.06	Switch off cap bank at Middletown
MENDOCNO 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	0.96	0.81	1.04	0.86	1.08	1.07	1.00	0.80	1.00	1.07	0.81	Middletown UVLS
MENDOCNO 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	1.01	0.88	1.02	0.93	1.02	1.02	1.01	0.87	1.01	1.02	0.88	Middletown UVLS
MEYERS 115 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.07	1.08	1.00	1.07	1.01	1.13	1.13	1.05	1.08	1.09	1.13	1.00	Switch off cap bank at Greenbrae
MIDDLTWN 60 kV	KONOCI6 60KV [6861] (KONOCI6-EGLE RCK)	P2	Line Section w/o Fault	0.87	0.86	0.63	0.99	0.54	1.06	1.09	0.97	0.83	0.96	1.10	0.63	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MIDDLTWN 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.86	0.85	0.56	0.98	0.52	1.06	1.09	0.97	0.84	0.95	1.10	0.56	Middletown UVLS
MIDDLTWN 60 kV	KONOCTI6 60KV SECTION 1E	P2	Bus	0.89	0.94	0.77	1.01	0.66	1.06	1.08	1.00	0.92	0.97	1.09	0.77	Middletown UVLS
MIDDLTWN 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.87	0.86	0.63	0.99	0.54	1.06	1.09	0.97	0.83	0.96	1.10	0.63	Middletown UVLS
MIDDLTWN 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.86	0.83	0.48	0.99	0.46	1.06	1.09	0.95	0.54	0.94	1.10	0.48	Middletown UVLS
MIDDLTWN 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.86	0.85	0.56	0.98	0.52	1.06	1.09	0.97	0.84	0.95	1.10	0.56	Middletown UVLS
MIDDLTWN 60 kV	EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.86	0.85	0.56	0.98	0.52	1.06	1.09	0.97	0.84	0.95	1.10	0.56	Middletown UVLS
MIDDLTWN 60 kV	KONOCTI6 - 1E 60KV & KONOCTI LINE	P2	Non-bus-tie Breaker	0.89	0.94	0.77	1.01	0.66	1.06	1.08	1.00	0.92	0.97	1.09	0.77	Middletown UVLS
NOVATO 60 kV	IGNACIO 60KV [7150] (IGNACO A-IG JCT)	P2	Line Section w/o Fault	0.96	0.97	0.88	1.00	0.90	1.07	1.08	0.95	0.96	1.03	1.08	0.88	Load power factor correction and voltage support if needed
NOVATO 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.06	1.01	1.07	1.02	1.11	1.11	1.05	1.06	1.07	1.11	1.01	Switch off cap bank at Greenbrae
NRTH TWR 115 kV	NRTH TWR 115KV SECTION 1D	P2	Bus	1.01	1.03	-6.44	1.03	0.95	1.11	1.11	-6.62	1.02	1.04	1.11	-6.47	Middletown UVLS
OLEMA 60 kV	IGNACIO 60KV [7180] (IGNACO B-STAF_JCT)	P2	Line Section w/o Fault	0.91	0.90	0.68	0.97	0.68	1.08	1.10	0.82	0.88	1.03	1.11	0.68	Load power factor correction and voltage support if needed
OLEMA 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.05	1.06	0.98	1.07	1.00	1.11	1.12	1.04	1.05	1.08	1.12	0.98	Switch off cap bank at Greenbrae
PENNGRVE 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	1.05	1.07	0.94	1.07	0.94	1.10	1.10	1.06	1.07	1.08	1.10	0.93	Load power factor correction and voltage support if needed
PHILO 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	1.01	0.89	1.03	0.93	1.04	1.05	1.01	0.85	1.03	1.05	0.89	Middletown UVLS
PTTR VLY 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.03	1.02	0.89	1.03	0.94	1.03	1.02	1.03	0.88	1.02	1.02	0.89	Middletown UVLS
PUEBLO 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	0.95	1.00	0.80	1.03	0.82	1.11	1.12	0.93	0.99	1.04	1.12	0.79	Load power factor correction and voltage support if needed
REDBUD 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.95	0.90	0.76	0.99	0.80	1.09	1.05	0.91	0.72	0.96	1.06	0.76	Middletown UVLS
SAN RAFL 115 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.05	1.06	1.00	1.07	1.01	1.11	1.11	1.05	1.06	1.07	1.11	1.00	Switch off cap bank at Greenbrae
SAN_RFLJ 60 kV	IGNACIO 60KV [7150] (IGNACO A-IG JCT)	P2	Line Section w/o Fault	0.96	0.97	0.90	1.00	0.92	1.07	1.07	0.95	0.96	1.02	1.08	0.90	Load power factor correction and voltage support if needed
SAN_RFLJ 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.03	1.04	0.99	1.06	1.01	1.10	1.10	1.03	1.03	1.06	1.11	0.99	Switch off cap bank at Greenbrae
SAUSALTO 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.02	1.03	0.97	1.05	0.98	1.10	1.10	1.01	1.02	1.05	1.10	0.97	Switch off cap bank at Greenbrae
SKAGGS 115 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.07	1.01	1.07	1.02	1.12	1.12	1.06	1.07	1.08	1.12	1.01	Switch off cap bank at Greenbrae
SNTA RSA 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	1.05	1.07	0.95	1.07	0.96	1.10	1.10	1.06	1.06	1.08	1.10	0.95	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	FULTON 115KV - SECTION 2D & 1D	P2	Bus-tie Breaker	0.99	1.02	0.85	1.01	0.85	1.03	1.04	1.04	1.03	1.02	1.04	0.85	Load power factor correction and voltage support if needed
SONOMA 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	0.93	0.99	0.76	1.02	0.79	1.12	1.13	0.91	0.98	1.04	1.13	0.76	Load power factor correction and voltage support if needed
STAFFORD 60 kV	IGNACIO 60KV [7180] (IGNACO B-STAF_JCT)	P2	Line Section w/o Fault	0.90	0.89	0.58	0.96	0.58	1.08	1.10	0.78	0.86	1.04	1.11	0.58	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
STAFFORD 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.07	0.99	1.08	1.00	1.12	1.12	1.04	1.06	1.08	1.12	0.99	Switch off cap bank at Greenbrae
STONY PT 115 kV	LAKEVILLE 115KV - SECTION 1D & 2D	P2	Bus-tie Breaker	1.05	1.07	0.94	1.07	0.95	1.10	1.10	1.06	1.06	1.08	1.10	0.94	Load power factor correction and voltage support if needed
STONY PT 115 kV	FULTON 115KV - SECTION 2D & 1D	P2	Bus-tie Breaker	0.99	1.02	0.87	1.01	0.87	1.03	1.04	1.04	1.02	1.02	1.04	0.87	Load power factor correction and voltage support if needed
TOCALOMA 60 kV	IGNACIO 60KV [7180] (IGNACO B-STAF_JCT)	P2	Line Section w/o Fault	0.90	0.88	0.62	0.96	0.62	1.08	1.10	0.79	0.86	1.04	1.11	0.62	Load power factor correction and voltage support if needed
TOCALOMA 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.06	1.06	0.99	1.07	1.00	1.12	1.12	1.04	1.05	1.08	1.12	0.99	Switch off cap bank at Greenbrae
UKIAH 115 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.00	0.96	0.83	1.03	0.87	1.07	1.06	1.00	0.82	1.00	1.06	0.83	Middletown UVLS
UKIAH JT 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	1.00	0.87	1.02	0.91	1.03	1.04	1.01	0.86	1.01	1.04	0.87	Middletown UVLS
UPPR LKE 60 kV	KONOCI6 60KV [6861] (KONOCI6-EGLE RCK)	P2	Line Section w/o Fault	0.97	0.92	0.85	1.00	0.81	1.03	1.04	0.97	0.91	1.00	1.04	0.85	Middletown UVLS
UPPR LKE 60 kV	EGLE RCK 115KV SECTION MA	P2	Bus	0.97	0.92	0.80	0.99	0.79	1.03	1.04	0.98	0.92	1.00	1.05	0.80	Middletown UVLS
UPPR LKE 60 kV	KONOCI6 60KV SECTION 1E	P2	Bus	0.98	0.95	0.90	1.00	0.86	1.02	1.04	0.99	0.95	1.00	1.04	0.90	Middletown UVLS
UPPR LKE 60 kV	EGLE RCK 60KV SECTION 1D	P2	Bus	0.97	0.92	0.85	1.00	0.81	1.03	1.04	0.97	0.91	1.00	1.04	0.85	Middletown UVLS
UPPR LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	0.96	0.91	0.69	1.00	0.71	1.03	1.04	0.97	0.70	0.99	1.05	0.69	Middletown UVLS
UPPR LKE 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2	Non-bus-tie Breaker	0.97	0.92	0.80	0.99	0.79	1.03	1.04	0.98	0.92	1.00	1.05	0.80	Middletown UVLS
UPPR LKE 60 kV	EGLE RCK - MA 115KV & EAGLE RCK-FULTON-SILVERDO LINE	P2	Non-bus-tie Breaker	0.97	0.92	0.80	0.99	0.79	1.03	1.04	0.98	0.92	1.00	1.05	0.80	Middletown UVLS
UPPR LKE 60 kV	KONOCI6 - 1E 60KV & KONOCI6 LINE	P2	Non-bus-tie Breaker	0.98	0.95	0.90	1.00	0.86	1.02	1.04	0.99	0.95	1.00	1.04	0.90	Middletown UVLS
WILLITS 60 kV	EGLE RCK - MA 115KV & EAGLE ROCK LINE	P2	Non-bus-tie Breaker	1.01	1.00	0.86	1.02	0.91	1.02	1.02	1.01	0.85	1.01	1.02	0.86	Middletown UVLS
WILLITS 60 kV	MENDOCNO - MA 60KV & MENDOCINO LINE (2)_Dup1	P2	Non-bus-tie Breaker	1.04	1.01	0.94	1.04	0.78	1.02	1.01	1.04	1.01	1.04	1.02	0.95	Middletown UVLS
WOODACRE 60 kV	IGNACIO 60KV [7140] (IGNACO B-WOODACRE)	P2	Line Section w/o Fault	0.97	0.96	0.88	1.00	0.86	1.09	1.10	0.92	0.94	1.04	1.11	0.86	Load power factor correction and voltage support if needed
WOODACRE 60 kV	IGNACIO 230KV SECTION 2D	P2	Bus	1.05	1.06	1.00	1.07	1.01	1.11	1.11	1.05	1.05	1.07	1.12	1.00	Switch off cap bank at Greenbrae
CALISTGA 60 kV	GEYSER16 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	0.87	0.87	0.86	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	0.86	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Middletown UVLS
CALPELLA 115 kV	GEYSER11 13.80KV GEN UNIT 1 & MENDOCINO 115KV [2420] MOAS OPENED ON CALPELLA_UKIAH	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	Switch off cap bank at Middletown
CLER LKE 60 kV	GEYSER16 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	0.89	0.76	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.76	Middletown UVLS
CLER LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCI6 60KV [6861]	P3	G1/N1	>0.9, <1.1	0.89	0.75	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.75	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CORONA 115 kV	GEYSER11 13.80KV GEN UNIT 1 & CORONA LAKEVILLE 115KV [4311]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.10	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Switch off cap bank at Middletown
DUNBAR 60 kV	GEYSER16 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	0.90	0.89	0.88	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Middletown UVLS
EGLE RCK 60 kV	GEYSER16 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	0.86	0.67	>0.9, <1.1	0.62	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.67	Middletown UVLS
GRANITE 60 kV	SMUDGE01 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	0.78	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	Middletown UVLS
GRANITE 60 kV	SMUDGE01 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.78	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	Middletown UVLS
HARTLEY 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	>0.9, <1.1	0.90	0.78	>0.9, <1.1	0.75	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.78	Middletown UVLS
HARTLEY 60 kV	GEYSER11 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	0.90	0.78	>0.9, <1.1	0.75	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.78	Middletown UVLS
KONOCTI6 60 kV	GEYSER16 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	0.86	0.67	>0.9, <1.1	0.62	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.67	Middletown UVLS
KONOCTI6 60 kV	GEYSER78 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	>0.9, <1.1	0.85	0.67	>0.9, <1.1	0.62	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.67	Middletown UVLS
LOWR LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	0.89	0.85	0.64	>0.9, <1.1	0.58	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.64	Middletown UVLS
LOWR LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	0.89	0.85	0.64	>0.9, <1.1	0.58	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.64	Middletown UVLS
MENDOCNO 115 kV	GEYSER11 13.80KV GEN UNIT 1 & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.10	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	Switch off cap bank at Middletown
MIDDLTWN 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	0.86	0.85	0.59	>0.9, <1.1	0.53	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.59	Middletown UVLS
MIDDLTWN 60 kV	GEYSER11 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	0.87	0.85	0.59	>0.9, <1.1	0.53	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.59	Middletown UVLS
PENNGRVE 115 kV	GEYSER11 13.80KV GEN UNIT 1 & CORONA LAKEVILLE 115KV [4311]	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.10	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	Switch off cap bank at Middletown
UPPR LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	>0.9, <1.1	0.92	0.83	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	Middletown UVLS
UPPR LKE 60 kV	MONTICLO 9.11KV GEN UNIT 3 & EGLE RCK 115/60KV TB 1	P3	G1/N1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.80	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	Middletown UVLS
ANNAPOLS 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.94	0.80	0.98	0.75	1.03	1.05	0.94	0.93	1.01	1.05	0.79	Protection Upgrade
CALISTGA 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.90	0.90	0.74	0.97	0.72	1.03	1.04	0.93	0.88	1.00	1.05	0.73	Protection Upgrade
COTATI 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.99	0.94	0.81	1.00	0.77	1.02	1.03	0.98	0.93	1.02	1.04	0.79	Protection Upgrade

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
FORT RSS 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.81	0.99	0.76	1.03	1.05	0.95	0.93	1.01	1.05	0.80	Protection Upgrade
FTCH MTN 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.96	0.96	0.84	1.01	0.82	1.02	1.03	0.99	0.95	1.01	1.03	0.83	Protection Upgrade
FULTON 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	1.00	1.00	0.87	1.03	0.84	1.04	1.04	1.02	0.99	1.04	1.04	0.86	Protection Upgrade
GUALALA 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.94	0.93	0.79	0.97	0.73	1.03	1.05	0.93	0.91	1.00	1.05	0.78	Protection Upgrade
GYSRVLE 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.83	1.00	0.81	1.02	1.03	0.98	0.93	1.01	1.03	0.82	Protection Upgrade
LAGUNA 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.98	0.95	0.82	1.00	0.78	1.03	1.03	0.98	0.94	1.02	1.04	0.80	Protection Upgrade
LAGUNATP 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.98	0.95	0.82	1.00	0.78	1.03	1.04	0.98	0.94	1.02	1.04	0.80	Protection Upgrade
MIRABEL 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.99	0.98	0.85	1.02	0.82	1.04	1.04	1.00	0.97	1.03	1.04	0.84	Protection Upgrade
MOLINO 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.97	0.96	0.82	1.00	0.79	1.03	1.04	0.98	0.95	1.02	1.04	0.81	Protection Upgrade
MONTE RO 115 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.97	0.97	0.82	1.00	0.78	1.04	1.05	0.96	0.95	1.02	1.05	0.81	Protection Upgrade
PENNGRVE 115 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.97	0.97	0.90	0.99	0.89	1.04	1.04	0.99	0.97	1.01	1.04	0.89	Protection Upgrade
PUEBLO 115 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.96	0.96	0.89	0.98	0.88	1.03	1.04	0.96	0.95	1.00	1.04	0.89	Protection Upgrade
ST.HELNA 115 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.94	0.80	1.00	0.78	1.03	1.04	0.97	0.93	1.02	1.04	0.79	Protection Upgrade
WINDSOR 60 kV	FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.97	0.97	0.84	1.01	0.82	1.03	1.03	0.99	0.96	1.02	1.03	0.83	Protection Upgrade
ALTO 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Load power factor correction and voltage support if needed
ALTO 60 kV	IGNACIO 60KV [7160] & IGNACIO 60KV [7150] MOAS OPENED ON SAN_RFLJ_GREENBRE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.86	>0.9, <1.1	0.85	>0.9, <1.1	>0.9, <1.1	0.89	0.89	>0.9, <1.1	>0.9, <1.1	0.86	Load power factor correction and voltage support if needed
ANNAPOLS 60 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.80	>0.9, <1.1	0.75	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.79	Load power factor correction and voltage support if needed
ANNAPOLS 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.42	>0.9, <1.1	>0.9, <1.1	0.45	>0.9, <1.1	>0.9, <1.1	0.87	0.37	>0.9, <1.1	0.68	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
BELLVUE 115 kV	FULTON 115KV [1620] & FULTON 115KV [1630]	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.88	Load power factor correction and voltage support if needed
BELLVUE 115 kV	LAKEVILE 230/115KV TB 1 & LAKEVILE 230/115KV TB 2	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BIG RIVR 60 kV	FORT BRAGG 60KV [2060] MOAS OPENED ON BIG RIVR_ELK & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P6	N-1-1	0.88	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Fort Bragg UVLS
BIG RIVR 60 kV	BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES & FORT BRAGG 60KV [2060] MOAS OPENED ON BIG RIVR_ELK	P6	N-1-1	0.88	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
BOLINAS 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	>0.9, <1.1	Load power factor correction and voltage support if needed
CALISTGA 60 kV	FULTON-GEYSR16-GEYSR12-GEYSR14 230KV [0] MOAS OPENED ON G16T0_2_WSRDFLT & LAKEVILLE #1 60KV [7360]	P6	N-1-1	0.87	0.87	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	0.87	0.86	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
CALISTGA 60 kV	GEYSR17 230/13.8KV TB 1 & LAKEVILLE #1 60KV [7360]	P6	N-1-1	>0.9, <1.1	0.86	0.86	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.86	Load power factor correction and voltage support if needed
CALISTGA 60 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.74	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	0.73	Load power factor correction and voltage support if needed
CALISTGA 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.39	>0.9, <1.1	>0.9, <1.1	0.45	>0.9, <1.1	>0.9, <1.1	0.87	0.37	>0.9, <1.1	0.66	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
CALPELLA 115 kV	MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	0.80	0.83	0.77	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	0.77	Load power factor correction and voltage support if needed
CALPELLA 115 kV	MENDOCINO 115KV [2410] & MENDOCINO 115KV [2420] MOAS OPENED ON CALPELLA_UKIAH	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Switch off cap bank at Middletown
CARQUINZ 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.14	1.14	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.14	>0.9, <1.1	Load power factor correction and voltage support if needed
CLER LKE 60 kV	MENDOCINO 60KV [7510] & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.90	0.51	0.49	>0.9, <1.1	0.46	>0.9, <1.1	1.11	>0.9, <1.1	0.50	>0.9, <1.1	1.12	0.49	Middletown UVLS
CLER LKE 60 kV	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.59	0.55	0.52	0.77	0.49	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.54	0.86	>0.9, <1.1	0.52	Middletown UVLS
CLER LKE 60 kV	KONOCI 60KV [6861] & CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON GRANITE_HPLND JT	P6	N-1-1	0.59	0.55	0.52	0.77	0.49	>0.9, <1.1	>0.9, <1.1	0.50	0.54	0.85	>0.9, <1.1	0.52	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CLOVRDLE 115 kV	GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	0.80	0.83	0.78	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.80	>0.9, <1.1	>0.9, <1.1	0.78	Load power factor correction and voltage support if needed
CLOVRDLE 115 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	0.85	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	0.81	Middletown UVLS
CLVRDLJT 60 kV	GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	0.90	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	0.88	Load power factor correction and voltage support if needed
CLVRDLJT 60 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	0.89	Middletown UVLS
CLVRDLJT 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.74	>0.9, <1.1	>0.9, <1.1	0.76	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.73	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
CORONA 115 kV	LAKEVILLE 230/115KV TB 1 & LAKEVILLE 230/115KV TB 2	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.90	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	0.90	Load power factor correction and voltage support if needed
COTATI 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.80	>0.9, <1.1	0.77	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.79	Load power factor correction and voltage support if needed
COTATI 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.73	>0.9, <1.1	>0.9, <1.1	0.74	>0.9, <1.1	>0.9, <1.1	0.86	0.70	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
COVELO6 60 kV	GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & MENDOCINO 60KV [7550] MOAS OPENED ON FRT BRGG_BIG RIVR	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
COVELO6 60 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.85	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	0.85	Middletown UVLS
DUNBAR 60 kV	GEYSERS #17 230KV [4770] & LAKEVILLE #1 60KV [7360]	P6	N-1-1	0.90	>0.9, <1.1	0.87	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.87	Load power factor correction and voltage support if needed
DUNBAR 60 kV	FULTON 60KV [6890] MOAS OPENED ON HDSBGTP1_FTCHMTNP & LAKEVILLE #1 60KV [7360]	P6	N-1-1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
DUNBAR 60 kV	GEYSR17 230/13.8KV TB 1 & LAKEVILLE #1 60KV [7360]	P6	N-1-1	>0.9, <1.1	0.89	0.88	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.88	Load power factor correction and voltage support if needed
DUNBAR 60 kV	LAKEVILLE 230/60KV TB 3 & LAKEVILLE 230/60KV TB 5	P6	N-1-1	0.55	>0.9, <1.1	>0.9, <1.1	0.69	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.50	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	MENDOCINO 60KV [7510] & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.85	0.46	0.43	>0.9, <1.1	0.39	>0.9, <1.1	1.12	>0.9, <1.1	0.45	>0.9, <1.1	1.14	0.43	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
EGLERCK 60 kV	EGLERCK 115/60KV TB 1 & CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLERLKEGRANITE	P6	N-1-1	0.53	0.49	0.46	0.75	0.42	>0.9, <1.1	>0.9, <1.1	0.46	0.48	0.83	>0.9, <1.1	0.46	Middletown UVLS
FORTRSS 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	0.76	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.80	Load power factor correction and voltage support if needed
FORTRSS 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.43	>0.9, <1.1	>0.9, <1.1	0.46	>0.9, <1.1	>0.9, <1.1	0.87	0.38	>0.9, <1.1	0.68	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
FRTBRGG 60 kV	FORT BRAGG 60KV [2060] MOAS OPENED ON BIG RIVRELK & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P6	N-1-1	0.89	0.85	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Fort Bragg UVLS
FTCHMTN 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	Load power factor correction and voltage support if needed
FTCHMTN 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.47	>0.9, <1.1	>0.9, <1.1	0.51	>0.9, <1.1	>0.9, <1.1	0.87	0.45	>0.9, <1.1	0.71	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
FULTON 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.80	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	Load power factor correction and voltage support if needed
FULTON 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.49	>0.9, <1.1	>0.9, <1.1	0.53	>0.9, <1.1	>0.9, <1.1	0.87	0.46	>0.9, <1.1	0.73	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
GARCIA 60 kV	MENDOCINO 60KV [7520] MOAS OPENED ON PHLOJCTHPLNDJT & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P6	N-1-1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Middletown UVLS
GRANITE 60 kV	MENDOCINO 60KV [7510] & EGLERCK 115/60KV TB 1	P6	N-1-1	>0.9, <1.1	0.59	0.59	>0.9, <1.1	0.57	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.58	>0.9, <1.1	1.11	0.59	Middletown UVLS
GRANITE 60 kV	KONOCI 60KV [6861] & CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON GRANITEHPLNDJT	P6	N-1-1	0.59	0.55	0.52	0.77	0.49	>0.9, <1.1	>0.9, <1.1	0.50	0.54	0.85	>0.9, <1.1	0.52	Middletown UVLS
GREENBRE 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Load power factor correction and voltage support if needed
GREENBRE 60 kV	IGNACIO 60KV [7150] MOAS OPENED ON SANRFLJGREENBRE & IGNACIO 60KV [7170]	P6	N-1-1	0.90	0.89	0.86	>0.9, <1.1	0.85	>0.9, <1.1	>0.9, <1.1	0.88	0.87	>0.9, <1.1	>0.9, <1.1	0.86	Load power factor correction and voltage support if needed
GUALALA 60 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.78	>0.9, <1.1	0.73	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.77	Load power factor correction and voltage support if needed
GUALALA 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.41	>0.9, <1.1	>0.9, <1.1	0.44	>0.9, <1.1	>0.9, <1.1	0.87	0.36	>0.9, <1.1	0.67	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
GYSRVLE 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.45	>0.9, <1.1	>0.9, <1.1	0.51	>0.9, <1.1	>0.9, <1.1	0.87	0.44	>0.9, <1.1	0.70	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
HARTLEY 60 kV	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE & KONOCTI 60KV [6861]	P6	N-1-1	0.65	0.61	0.58	0.79	0.56	>0.9, <1.1	>0.9, <1.1	0.56	0.60	0.88	>0.9, <1.1	0.58	Middletown UVLS
HARTLEY 60 kV	EGLE RCK 115/60KV TB 1 & MENDOCINO 60KV [7510]	P6	N-1-1	0.90	0.50	0.47	>0.9, <1.1	0.45	>0.9, <1.1	1.11	>0.9, <1.1	0.49	>0.9, <1.1	1.12	0.47	Middletown UVLS
HighWAY 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
HPLND JT 60 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.81	>0.9, <1.1	0.85	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	0.81	Middletown UVLS
IGNACIO 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	MENDOCINO 60KV [7510] & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.85	0.46	0.43	>0.9, <1.1	0.39	>0.9, <1.1	1.12	>0.9, <1.1	0.45	>0.9, <1.1	1.14	0.43	Middletown UVLS
KONOCTI6 60 kV	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE & KONOCTI 60KV [6861]	P6	N-1-1	0.53	0.50	0.45	0.75	0.42	>0.9, <1.1	>0.9, <1.1	0.45	0.48	0.83	>0.9, <1.1	0.45	Middletown UVLS
LAGUNA 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.78	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.80	Load power factor correction and voltage support if needed
LAGUNA 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.63	>0.9, <1.1	>0.9, <1.1	0.65	>0.9, <1.1	>0.9, <1.1	0.86	0.60	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
LAKEVILLE 115 kV	LAKEVILE 230/115KV TB 2 & LAKEVILE 230/115KV TB 1	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	0.90	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	0.89	Load power factor correction and voltage support if needed
LAKEVILLE 60 kV	LAKEVILE 230/60KV TB 3 & LAKEVILE 230/60KV TB 5	P6	N-1-1	0.59	>0.9, <1.1	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.55	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	MENDOCINO 60KV [7510] & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.84	0.45	0.41	>0.9, <1.1	0.37	>0.9, <1.1	1.13	>0.9, <1.1	0.43	>0.9, <1.1	1.14	0.41	Middletown UVLS
LOWR LKE 60 kV	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE & KONOCTI 60KV [6861]	P6	N-1-1	0.51	0.48	0.43	0.75	0.40	>0.9, <1.1	>0.9, <1.1	0.45	0.47	0.82	>0.9, <1.1	0.43	Middletown UVLS
LUCERNE 115 kV	MENDOCINO 115KV [2410] & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Switch off cap bank at Middletown
LUCERNE 115 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	0.87	Middletown UVLS

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
LYTNVLE 60 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.86	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.90	>0.9, <1.1	>0.9, <1.1	0.86	Middletown UVLS
LYTNVLE 60 kV	LAKEVILLE 230KV [4970] & MENDOCINO 60KV [7550] MOAS OPENED ON FRT BRGG_BIG RIVR	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
MASONITE 60 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.86	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	0.86	Middletown UVLS
MENDOCNO 115 kV	MENDOCINO 115KV [2410] & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Switch off cap bank at Middletown
MENDOCNO 115 kV	KONOCTI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	>0.9, <1.1	>0.9, <1.1	0.83	Middletown UVLS
MEYERS 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.14	1.14	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.14	>0.9, <1.1	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	MENDOCINO 60KV [7510] & EGLE RCK 115/60KV TB 1	P6	N-1-1	0.81	0.44	0.38	>0.9, <1.1	0.34	>0.9, <1.1	1.14	>0.9, <1.1	0.42	>0.9, <1.1	1.16	0.38	Middletown UVLS
MIDDLTWN 60 kV	CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE & KONOCTI 60KV [6861]	P6	N-1-1	0.48	0.47	0.40	0.75	0.36	>0.9, <1.1	>0.9, <1.1	0.45	0.46	0.81	>0.9, <1.1	0.40	Middletown UVLS
MIRABEL 60 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.85	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	Load power factor correction and voltage support if needed
MIRABEL 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.47	>0.9, <1.1	>0.9, <1.1	0.51	>0.9, <1.1	>0.9, <1.1	0.87	0.43	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
MOLINO 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.79	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	Load power factor correction and voltage support if needed
MOLINO 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.53	>0.9, <1.1	>0.9, <1.1	0.57	>0.9, <1.1	>0.9, <1.1	0.87	0.50	>0.9, <1.1	0.76	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
MONROE1 115 kV	LAKEVILE 230/115KV TB 1 & LAKEVILE 230/115KV TB 2	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.10	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	>0.9, <1.1	Load power factor correction and voltage support if needed
MONTCLLO 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	Load power factor correction and voltage support if needed
MONTE RO 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.78	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.81	Load power factor correction and voltage support if needed
MONTE RO 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.45	>0.9, <1.1	>0.9, <1.1	0.47	>0.9, <1.1	>0.9, <1.1	0.87	0.40	>0.9, <1.1	0.70	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
NOVATO 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
NRTH TWR 115 kV	IGNACIO SVD=R & NRTH TWR-OLEUM-CHRISTIE 115KV [0]	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
OLEMA 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	>0.9, <1.1	Load power factor correction and voltage support if needed
PENNGRVE 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.90	>0.9, <1.1	0.89	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.89	Load power factor correction and voltage support if needed
PENNGRVE 115 kV	LAKEVILE 230/115KV TB 1 & LAKEVILE 230/115KV TB 2	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
PHILO 60 kV	MENDOCINO 60KV [7520] MOAS OPENED ON PHLO JCT_HPLND JT & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P6	N-1-1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	0.90	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	Middletown UVLS
PHILO 60 kV	KONOCI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.88	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	0.88	Middletown UVLS
PUEBLO 115 kV	LAKEVILLE 115KV [2063] & LAKEVILLE 115KV [2070]	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.84	1.10	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	0.82	Load power factor correction and voltage support if needed
REDBUD 115 kV	EAGLE ROCK-REDBUD 115KV [1480] & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
RINCON 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	Load power factor correction and voltage support if needed
SAN RAFL 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
SAN_RFLJ 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed
SAUSALTO 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	1.11	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Load power factor correction and voltage support if needed
SAUSALTO 60 kV	IGNACIO 60KV [7160] & IGNACIO 60KV [7150] MOAS OPENED ON SAN_RFLJ_GREENBRE	P6	N-1-1	>0.9, <1.1	0.90	0.85	>0.9, <1.1	0.84	>0.9, <1.1	>0.9, <1.1	0.88	0.88	>0.9, <1.1	>0.9, <1.1	0.85	Load power factor correction and voltage support if needed
SILVERDO 115 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.83	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	Load power factor correction and voltage support if needed
SKAGGS 115 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	1.13	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	>0.9, <1.1	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
SNTA RSA 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.82	>0.9, <1.1	0.81	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.82	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	LAKEVILE 230/115KV TB 1 & LAKEVILE 230/115KV TB 2	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.10	1.10	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.11	>0.9, <1.1	Load power factor correction and voltage support if needed
SONOMA 115 kV	LAKEVILLE 115KV [2063] & LAKEVILLE 115KV [2070]	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.79	>0.9, <1.1	0.81	1.11	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	0.79	Load power factor correction and voltage support if needed
SONOMA 115 kV	LAKEVILE 230/115KV TB 2 & LAKEVILE 230/115KV TB 1	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.89	>0.9, <1.1	0.89	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	0.89	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.80	>0.9, <1.1	0.78	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.79	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	FULTON 115/60KV TB 2 & FULTON 115/60KV TB 1	P6	N-1-1	0.44	>0.9, <1.1	>0.9, <1.1	0.48	>0.9, <1.1	>0.9, <1.1	0.87	0.41	>0.9, <1.1	0.69	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
STAFFORD 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	>0.9, <1.1	Load power factor correction and voltage support if needed
STONY PT 115 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.84	>0.9, <1.1	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	Load power factor correction and voltage support if needed
TOCALOMA 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.13	>0.9, <1.1	Load power factor correction and voltage support if needed
UKIAH 115 kV	GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE & MENDOCINO 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA	P6	N-1-1	0.79	0.83	0.76	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.80	>0.9, <1.1	>0.9, <1.1	0.76	Load power factor correction and voltage support if needed
UPPR LKE 60 kV	EGLE RCK 115/60KV TB 1 & CLEAR LAKE-HOPLAND 60KV [6390] MOAS OPENED ON CLER LKE_GRANITE	P6	N-1-1	0.72	0.68	0.68	0.83	0.66	>0.9, <1.1	>0.9, <1.1	0.65	0.68	>0.9, <1.1	>0.9, <1.1	0.68	Middletown UVLS
WILLITS 60 kV	KONOCI 60KV [6861] & GEYSERS #3 115KV [1650] MOAS OPENED ON MPE TAP_MPE	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.87	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.90	>0.9, <1.1	>0.9, <1.1	0.88	Middletown UVLS
WINDSOR 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.84	>0.9, <1.1	0.82	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.83	Load power factor correction and voltage support if needed
WINDSOR 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.47	>0.9, <1.1	>0.9, <1.1	0.51	>0.9, <1.1	>0.9, <1.1	0.87	0.45	>0.9, <1.1	0.71	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
WOHLER 60 kV	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	0.85	>0.9, <1.1	0.83	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	0.84	Load power factor correction and voltage support if needed
WOHLER 60 kV	FULTON 115/60KV TB 1 & FULTON 115/60KV TB 2	P6	N-1-1	0.48	>0.9, <1.1	>0.9, <1.1	0.51	>0.9, <1.1	>0.9, <1.1	0.87	0.44	>0.9, <1.1	0.72	>0.9, <1.1	>0.9, <1.1	Load power factor correction and voltage support if needed
WOODACRE 60 kV	GEYSR18-LAKEVILE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SNTAFE & IGNACIO SVD=R	P6	N-1-1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	1.12	>0.9, <1.1	>0.9, <1.1	>0.9, <1.1	1.12	>0.9, <1.1	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				Project & Potential Mitigation Solutions
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
BELLVUE 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.99	1.02	0.87	1.01	0.87	1.03	1.04	1.04	1.02	1.02	1.04	0.88	Load power factor correction and voltage support if needed
PUEBLO 115 kV	LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	0.95	0.99	0.82	1.02	0.84	1.10	1.11	0.93	0.98	1.03	1.11	0.82	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.99	1.03	0.85	1.01	0.85	1.03	1.04	1.05	1.03	1.02	1.04	0.85	Load power factor correction and voltage support if needed
SONOMA 115 kV	LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	0.93	0.98	0.79	1.01	0.81	1.11	1.12	0.91	0.97	1.03	1.12	0.79	Load power factor correction and voltage support if needed
STONY PT 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.99	1.02	0.86	1.01	0.86	1.03	1.04	1.04	1.02	1.02	1.04	0.87	Load power factor correction and voltage support if needed

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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
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
CLER LKE 60 kV	KONOCTI 60KV [6861]	P1	N-1	7	12	22	0	0	6	3	27	14	3	1	22	Load power factor correction and voltage support if needed
GRANITE 60 kV	KONOCTI 60KV [6861]	P1	N-1	6	11	18	0	0	5	3	22	12	2	1	18	Load power factor correction and voltage support if needed
HARTLEY 60 kV	KONOCTI 60KV [6861]	P1	N-1	6	11	18	0	0	5	3	23	12	3	1	18	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	KONOCTI 60KV [6861]	P1	N-1	12	18	33	1	0	10	6	40	20	6	1	33	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	KONOCTI 60KV [6861]	P1	N-1	13	18	35	1	0	10	6	42	20	6	1	35	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	KONOCTI 60KV [6861]	P1	N-1	13	18	38	1	0	10	6	45	20	6	1	38	Load power factor correction and voltage support if needed
UPPR LKE 60 kV	KONOCTI 60KV [6861]	P1	N-1	5	9	14	0	0	4	2	18	10	2	0	14	Load power factor correction and voltage support if needed
CALISTGA 60 kV	LAKEVILLE #1 60KV [7360]	P1	N-1	7	8	9	0	1	9	5	9	9	2	2	9	Load power factor correction and voltage support if needed
DUNBAR 60 kV	LAKEVILLE #1 60KV [7360]	P1	N-1	9	10	10	2	4	11	5	10	11	0	4	10	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	LAKEVILLE #1 60KV [7360]	P1	N-1	7	8	9	0	1	9	5	8	8	2	2	9	Load power factor correction and voltage support if needed
CLER LKE 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	7	12	21	0	0	6	3	27	14	3	1	21	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	14	20	35	0	1	10	6	43	22	7	2	36	Load power factor correction and voltage support if needed
GRANITE 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	6	10	17	0	0	5	3	22	12	2	1	17	Load power factor correction and voltage support if needed
HARTLEY 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	6	11	18	0	0	5	3	23	12	2	1	18	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	12	18	32	1	0	10	6	40	20	6	1	32	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	12	18	34	1	0	10	6	42	20	6	1	34	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	13	17	37	1	0	10	6	45	20	6	1	38	Load power factor correction and voltage support if needed
UPPR LKE 60 kV	EGLE RCK 115/60KV TB 1	P1	N-1	4	9	14	0	0	4	2	18	10	2	0	14	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P1	N-1	7	8	5	2	1	4	5	6	9	4	1	5	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	SANTA FE 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	<8	<8	35	<8	<8	<8	<8	40	<8	<8	<8	34	Load power factor correction and voltage support if needed
CALISTGA 60 kV	GEYSER16 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	8	8	9	<8	<8	9	<8	9	<8	<8	<8	<8	Load power factor correction and voltage support if needed

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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
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
DUNBAR 60 kV	GEYSER16 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	9	10	10	<8	<8	11	<8	11	<8	<8	<8	<8	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	GEYSER16 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	<8	8	8	<8	<8	9	<8	8	<8	<8	<8	<8	Load power factor correction and voltage support if needed
CALISTGA 60 kV	GEYSER17 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	<8	<8	9	<8	<8	<8	<8	8	<8	<8	<8	9	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	GEYSER17 13.80KV GEN UNIT 1 & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P3	G1/N1	<8	<8	<8	<8	<8	<8	<8	<8	9	<8	<8	<8	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PKONOCTI 60KV [6861]	P3	G1/N1	<8	18	34	<8	<8	10	<8	<8	<8	<8	<8	35	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PKONOCTI 60KV [6861]	P3	G1/N1	<8	18	37	<8	<8	10	<8	<8	<8	<8	<8	37	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PKONOCTI 60KV [6861]	P3	G1/N1	13	18	40	<8	<8	10	<8	<8	<8	<8	<8	40	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PEGLE RCK 115/60KV TB 1	P3	G1/N1	<8	18	37	<8	<8	10	<8	42	<8	<8	<8	37	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PEGLE RCK 115/60KV TB 1	P3	G1/N1	13	18	40	<8	<8	10	<8	46	<8	<8	<8	41	Load power factor correction and voltage support if needed
UPPR LKE 60 kV	POTTRVLY 2.40KV GEN UNIT 1 & PEGLE RCK 115/60KV TB 1	P3	G1/N1	<8	<8	15	<8	<8	<8	<8	18	<8	<8	<8	15	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	GEO.ENGY 9.11KV GEN UNIT 1 & PEGLE RCK 115/60KV TB 1	P3	G1/N1	<8	<8	38	<8	<8	<8	<8	44	<8	<8	<8	38	Load power factor correction and voltage support if needed
GRANITE 60 kV	GEO.ENGY 9.11KV GEN UNIT 2 & PKONOCTI 60KV [6861]	P3	G1/N1	<8	<8	19	<8	<8	<8	<8	22	<8	<8	<8	19	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	GEO.ENGY 9.11KV GEN UNIT 2 & PKONOCTI 60KV [6861]	P3	G1/N1	<8	<8	37	<8	<8	<8	<8	42	<8	<8	<8	37	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	GEO.ENGY 9.11KV GEN UNIT 2 & PKONOCTI 60KV [6861]	P3	G1/N1	<8	<8	41	<8	<8	<8	<8	45	<8	<8	<8	41	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	GEYSR5-6 13.80KV GEN UNIT 1 & BIG RIVR 60.00KV ID=7H & BIG RIVR 60.00KV ID=5H & BIG RIVR 60.00KV ID=8H & BIG RIVR 60.00KV ID=V SHUNT DEVICES	P3	G1/N1	<8	9	<8	<8	<8	<8	<8	<8	9	<8	<8	<8	Load power factor correction and voltage support if needed
GRANITE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<8	11	19	<8	<8	<8	<8	22	<8	<8	<8	19	Load power factor correction and voltage support if needed
HARTLEY 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<8	11	20	<8	<8	<8	<8	22	<8	<8	<8	20	Load power factor correction and voltage support if needed
KONOCTI6 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	12	18	35	<8	<8	<8	<8	40	<8	<8	<8	35	Load power factor correction and voltage support if needed
LOWR LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	13	18	37	<8	<8	<8	<8	42	<8	<8	<8	37	Load power factor correction and voltage support if needed

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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
				2020 Summer Peak	2023 Summer Peak	2028 Summer Peak	2020 Spring Off-Peak	2023 Spring Peak	2020 Winter Peak	2023 Winter Peak	2028 Winter Peak	2023 SP High CEC Forecast	2023 SpOP Hi Renew & Min Gas Gen	2020 SP Heavy Renewable & Min Gas Gen	2028 Retirement of QF Generations	
MIDDLTWN 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	13	18	40	<8	<8	<8	<8	45	<8	<8	<8	40	Load power factor correction and voltage support if needed
UPPR LKE 60 kV	GEYSER11 13.80KV GEN UNIT 1 & KONOCTI 60KV [6861]	P3	G1/N1	<8	9	15	<8	<8	<8	<8	17	<8	<8	<8	15	Load power factor correction and voltage support if needed
EGLE RCK 60 kV	GEYSER11 13.80KV GEN UNIT 1 & EGLE RCK 115/60KV TB 1	P3	G1/N1	14	20	38	<8	<8	<8	<8	43	<8	<8	<8	38	Load power factor correction and voltage support if needed
CALISTGA 60 kV	GEYSER12 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	7	<8	10	<8	<8	<8	<8	9	9	<8	<8	10	Load power factor correction and voltage support if needed
DUNBAR 60 kV	GEYSER12 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	9	<8	10	<8	<8	<8	<8	10	12	<8	<8	10	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	GEYSER12 13.80KV GEN UNIT 1 & LAKEVILLE #1 60KV [7360]	P3	G1/N1	<8	<8	9	<8	<8	<8	<8	8	8	<8	<8	9	Load power factor correction and voltage support if needed

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2020 Summer Peak	2028 Summer Peak	2023 Spring Off-Peak	2020 SP Heavy Renewable & Min Gas Gen	2023 SpOP Hi Renew & Min Gas Gen	
Bus fault at LAKEVILE 230kV	P2-2	Bus	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Internal fault at Non-bus-tie-breaker #222 at LAKEVILE 230kV	P2-3	Non-Bus-Tie Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Internal fault at Bus-tie-breaker #422 at LAKEVILE 230kV	P2-4	Bus-Tie Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
GEYSER11 Unit 1 and LAKEVILE -CR2T3_18 230kV No.1 Line	P3-2	G-1/N-1	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #212 protecting LAKEVILE-CR2T3_18 230kV #1 Line	P4-2	Stuck Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #282 protecting LAKEVLLE/LAKEVILE 115/230kV No.2 Transformer	P4-3	Stuck Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #202 protecting LAKEVILE 230 kV Bus #2 SEC E	P4-5	Stuck Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #422 protecting LAKEVILE 230kV Bus #2 SEC E	P4-6	Stuck Breaker	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
LAKEVILE -CR2T3_18 230kV No.1 Line	P5-2	Non-Redundant Relay	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
LAKEVILE/LAKEVLLE 230/115 kV No.1 Transformer	P5-3	Non-Redundant Relay	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
LAKEVILE 230kV SEC E	P5-5	Non-Redundant Relay	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
LAKEVILE -CR2T3_18 230kV No.1 Line and TULUCAY-VACA-DIX 230kV No.1 Line	P6-1	N-1-1	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
LAKEVILE -CR2T3_18 230kV No.1 Line and IGNACIO/IGNACIO 230/115 kV No.6 Transformer	P6-2	N-1-1	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
IGNACIO/IGNACIO 230/115 kV No.6 Transformer	P1-3	N-1	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
PUEBLO 115kV ID. v SVD	P1-4	N-1	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
LP SAMOA Unit 1 and HUMB_BS1/HUMB_G1 115/13.8 kV No.1 Transformer	P3-3	G-1/N-1	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
GEYSER11 Unit 1 and PUEBLO 115 kV ID v SVD	P3-4	G-1/N-1	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
PUEBLO 115 kV ID v SVD and BIG RIVR 60 kV ID v SVD	P6-3	N-1-1	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #366 protecting MENDOCNO 115 kV ID v SVD	P4-4	Stuck Breaker	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
MENDOCNO 115 kV ID v SVD	P5-4	Non-Redundant Relay	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Breaker stuck for CB #182 protecting GEYSER78 Unit 1	P4-1	Stuck Breaker	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Under review with PTO .
GEYSER78 Unit 1	P5-1	Non-Redundant Relay	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
GEYSER11 Unit 1	P1-1	N-1	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
GEYSER11 Unit 1 and GEYSER13 Unit 1	P3-1	G-1/N-1	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	Stable/WECC criteria met	No violation
Successful reclose on fault on Fulton - Lakeville 230 kV Line and Geysers 9 - Lakeville 230 kV Line	P7-1	DCTL	WECC criteria not met	WECC criteria not met	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Under review with PTO .
Failed reclose on fault on Fulton - Lakeville 230 kV Line and Geysers 9 - Lakeville 230 kV Line	P7-1	DCTL	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	WECC criteria not met	Stable/WECC criteria met	Under review with PTO .

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Single Contingency Load Drop

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
			Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	

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

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Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)										Potential Mitigation Solutions
	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	

No Single Source Substation with more than 100 MW Load.