

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)								Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
Clear Lake - Eagle Rock 60 kV (Clear Lake 60 kV sub to Konocti Sub 60 kV)	P1-2:A2:56:_KONOCITI-EAGLE ROCK 60KV [6861]	P1	N-1	88	92	113	60	62	73	61	8	94	36	61	Continue to Monitor
	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	88	92	112	60	62	74	61	8	94	36	61	Continue to Monitor
	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	84	85	158	79	86	127	80	46	86	62	80	Continue to Monitor
	P5-5A:A2:11:_MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	84	84	157	78	85	125	80	46	86	62	80	Add Redundant Relay
	P5-5A:A2:8:_FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	NConv	NConv	NConv	NConv	NConv	NConv	NConv	65	NConv	66	NConv	Add Redundant Relay
	P5-5A:A2:9:_FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	NConv	NConv	NConv	NConv	NConv	NConv	NConv	64	NConv	64	NConv	Add Redundant Relay
	P7-1:A2:23:_EAGLE ROCK -REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	76	77	108	70	74	84	69	39	NConv	64	NConv	Continue to Monitor
Corona- Lakeville 115kV Line	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	127	52	65	142	49	53	111	20	53	82	111	Project: Santa Rosa 115 kV lines Reconductoring project
	P5-5A:A2:1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	119	54	86	135	52	50	104	7	55	51	104	Project: Santa Rosa 115 kV lines Reconductoring project
	P5-5A:A2:9:_FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	NConv	NConv	64	NConv	NConv	53	NConv	20	NConv	83	NConv	Project: Santa Rosa 115 kV lines Reconductoring project
	P5-5A:A2:1:_CLOVERDALE 115 KV(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	128	52	64	142	49	53	111	20	53	82	111	Project: Santa Rosa 115 kV lines Reconductoring project
	P7-1:A2:15:_FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	128	52	65	142	50	53	112	20	53	83	111	Project: Santa Rosa 115 kV lines Reconductoring project
EAGLE ROCK 115/60 KV BANK NO.1	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	86	88	131	90	97	129	72	28	90	52	72	Continue to Monitor
	P5-5A:A2:11:_MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	86	88	130	90	96	128	71	28	89	52	72	Add Redundant Relay
	P5-5A:A2:8:_FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	NConv	NConv	NConv	NConv	NConv	NConv	NConv	38	NConv	55	NConv	Add Redundant Relay
	P7-1:A2:23:_EAGLE ROCK -REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	81	82	100	84	88	101	65	24	83	48	65	Continue to Monitor
GEYSER # 3 - CLOVERDALE 115K (CLOVERDALE 115KV to MPE TAP115KV)	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	71	72	119	62	65	82	66	33	73	47	66	Continue to Monitor
	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	79	78	122	66	69	79	70	40	79	55	70	Continue to Monitor
	P5-5A:A2:11:_MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	69	69	110	59	62	79	64	36	70	46	64	Continue to Monitor
	P7-1:A2:23:_EAGLE ROCK -REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	89	90	129	80	85	97	81	39	92	58	81	Continue to Monitor
	P7-1:A2:4:_MENDOCINO-REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	77	78	111	68	71	83	72	37	78	53	72	Continue to Monitor
	P1-2:A2:56:_KONOCITI-EAGLE ROCK 60KV [6861]	P1	N-1	108	108	44	102	104	44	87	50	109	74	87	Maintenance project to increase capacity of Hopland Bank#2
	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	107	108	44	102	104	44	87	51	109	74	87	Maintenance project to increase capacity of Hopland Bank#2
	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	108	102	35	94	90	35	89	83	103	93	89	Maintenance project to increase capacity of Hopland Bank#2
	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	106	102	36	94	90	36	89	83	102	93	89	Maintenance project to increase capacity of Hopland Bank#2
	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	108	102	35	94	90	35	89	83	104	93	89	Maintenance project to increase capacity of Hopland Bank#2

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				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
HOPLAND BANK 115/60.00 BANK NO.2	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	109	108	66	120	129	66	99	64	109	84	99	Maintenance project to increase capacity of Hopland Bank#2
	P2-4:A2:8:_FULTON 115KV - SECTION 2F & 1F	P2-4	Bus-Tie-Breaker	NConv	NConv	73	NConv	NConv	73	NConv	126	NConv	142	NConv	Maintenance project to increase capacity of Hopland Bank#2
	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	118	109	48	106	105	48	89	51	111	79	89	Maintenance project to increase capacity of Hopland Bank#2
	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	112	112	68	123	133	68	102	64	113	86	102	Maintenance project to increase capacity of Hopland Bank#2
	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	76	NConv	NConv	76	NConv	130	NConv	144	NConv	Maintenance project to increase capacity of Hopland Bank#2
	P5-5A:A2:9:_ FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	73	NConv	NConv	73	NConv	129	NConv	141	NConv	Maintenance project to increase capacity of Hopland Bank#2
	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60KV Batt"	P5	Non-Redundant Relay	108	103	36	95	92	36	89	82	104	93	89	Maintenance project to increase capacity of Hopland Bank#2
	P7-1:A2:6:_GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	104	96	47	95	93	47	88	66	96	86	88	Maintenance project to increase capacity of Hopland Bank#2
Konocti - Eagle Rock 60KV	P2-1:A2:25:_GEYSERS #3-CLOVERDALE 115KV [1650] (CLOVRDLE-AIDLINJCT)	P2-1	Line Section w/o Fault	91	93	101	79	82	88	76	37	94	59	76	Continue to Monitor
	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	98	100	151	88	94	123	81	31	101	59	81	Continue to Monitor
	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	72	72	116	62	65	73	58	26	83	48	58	Continue to Monitor
	P7-1:A2:23:_EAGLE ROCK-REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	92	94	113	82	85	99	73	27	95	54	73	Continue to Monitor
Clear Lake- Hopland 60 Kv(Clear Lake 60 KV sub to Granite Sub 60 KV)	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	113	118	80	79	82	52	86	10	121	51	86	Project: Clear Lake 60 kV System Reinforcement
	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	113	118	80	79	82	52	85	10	120	51	85	Project: Clear Lake 60 kV System Reinforcement
	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	114	121	59	81	84	55	88	18	123	55	88	Project: Clear Lake 60 kV System Reinforcement
	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	114	121	59	81	84	55	88	18	123	55	88	Project: Clear Lake 60 kV System Reinforcement
	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	114	121	NConv	81	84	54	88	18	124	55	88	Under review
	P2-3:A2:27:_EGLE RCK - MA 115KV & EGLE RCK-HOMSTKTP-CORTINA LINE	P2-3	Non-Bus-Tie Breaker	117	123	NConv	83	85	NConv	89	19	124	56	89	Under review
	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	116	122	86	82	85	55	88	12	125	54	89	Project: Clear Lake 60 kV System Reinforcement
	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	115	122	60	81	85	55	88	18	124	55	88	Project: Clear Lake 60 kV System Reinforcement
	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60KV Batt"	P5	Non-Redundant Relay	114	121	NConv	80	84	55	88	18	124	55	88	Add Redunctane Battery
Mendocino - Clearlake 60 kv (Mendocino Sub 60 kv to Upper Lake Sub 60 Kv)	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	79	80	132	63	64	102	55	3	81	35	55	Continue to Monitor
	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	79	80	131	63	64	102	55	3	81	35	55	Continue to Monitor
	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	71	75	121	56	58	96	51	1	76	31	51	Continue to Monitor
	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	136	48	61	137	46	50	120	19	49	89	120	Project: Santa Rosa 115 kv lines Reconductoring project
	P5-5A:A2:1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	127	51	82	130	49	47	112	7	51	53	112	Project: Santa Rosa 115 kv lines Reconductoring project

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				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
Santa Rosa- Corona 115 kv (Santa Rosa 115kv sub to Stony Point Sub 115 kv)	P5-5A:A2:9:_ FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	60	NConv	NConv	50	NConv	19	NConv	89	NConv	Project: Santa Rosa 115 kv lines Reconductoring project
	P5-5A:A2:1:_ CLOVERDALE 115 KV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	136	48	60	137	46	50	120	19	49	89	120	Project: Santa Rosa 115 kv lines Reconductoring project
	FULTON-SANTA ROSA #2 115KV [1630] & FULTON-SANTA ROSA #1 115KV [1620]	P6	N-1-1	136.60	<100	<100	136.73	<100	<100	119.35	<100	<100	<100	119.36	Project: Santa Rosa 115 kv lines Reconductoring project
	P7-1:A2:15:_ FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	137	48	61	137	47	50	121	19	49	89	119	Project: Santa Rosa 115 kv lines Reconductoring project
Tulucay - Vaca 230 kv Line	P2-4:A2:2:_ LAKEVILLE 230KV - SECTION 2E & 1E	P2-4	Bus-Tie-Breaker	118	76	88	106	77	87	92	17	77	91	92	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
	P5-5A:A2:13:_ LAKEVILLE 230 KV BUS 1&2 SECTION E(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	118	76	88	106	77	87	92	17	77	91	92	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
	VACA-LAKEVILLE #1 230KV [5840] & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SANTAFE	P6	N-1-1	112.85	<100	<100	103.23	<100	<100	91.82	<100	<100	77.75	91.78	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
	P7-1:A2:11:_ GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	102	75	85	89	69	79	82	22	76	79	82	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
Vaca - Lakeville 230 kv Line No. 1	P2-4:A2:1:_ LAKEVILLE 230KV - SECTION 2E & 2D	P2-4	Bus-Tie-Breaker	114	75	88	110	88	94	88	7	76	77	88	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
	TULUCAY-VACA 230KV [5800] & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SANTAFE	P6	N-1-1	115	<100	<100	107	<100	<100	93	<100	<100	79	93	Project: Vaca Dixon-Lakeville 230 kv Corridor Series Compensation
Fulton - Hopland 60 kv (Hopland Jct 60 kv to Cloverdale Jct 60 kv)	P1-2:A2:19:_ EGGLE ROCK-FULTON-SILVERDO 115KV [0]	P1	N-1	101	81	76	54	47	65	81	85	80	100	81	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P1-2:A6:12:_ SILVERDO-FULTON-EGGLE ROCK 115KV [0]	P1	N-1	101	81	76	54	47	65	81	85	80	100	81	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P2-1:A2:30:_ EAGLE ROCK-FULTON-SILVERADO 115KV [4392] (EGGLE ROCK-ERFT4_23CRJ)	P2-1	Line Section w/o Fault	101	81	77	54	47	65	82	85	81	100	82	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P2-3:A6:2:_ SILVERDO - 1E 115KV & SILVERDO-FULTON-EGGLE ROCK LINE	P2-3	Non-Bus-Tie Breaker	101	81	76	54	47	65	81	85	80	100	81	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	229	NConv	NConv	179	NConv	199	NConv	217	NConv	Add Redunctane Relay
	P5-5A:A2:9:_ FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	220	NConv	NConv	173	NConv	199	NConv	216	NConv	Add Redunctane Relay
	P5-5c(DC):A2:17: Station DC Battery Supply "RINCON 115KV Batt"	P5	Non-Redundant Relay	101	81	76	54	47	65	81	85	80	100	81	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P7-1:A2:5:_ GEYSERS #17-FULTON & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	106	86	81	57	50	68	90	89	85	104	90	Project: Fulton –Fitch Mountain 60 kv Line reconductor
	P7-1:A2:6:_ GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	114	93	88	63	55	73	94	96	92	112	94	Project: Fulton –Fitch Mountain 60 kv Line reconductor
Fulton- Molino- Cotati 60 kv(Molino sub 60 kv to Molino Jct 60 kv)	P1-2:A2:66: LAKEVILLE #2 60KV [7340] MOAS OPENED ON PETLMA A_LKVL JT	P1	N-1	76	84	101	71	73	79	79	9	85	21	79	Continue to Monitor
	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	220	NConv	NConv	164	NConv	11	NConv	19	NConv	Add Redunctane Relay
	P5-5A:A2:9:_ FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NConv	NConv	224	NConv	NConv	168	NConv	11	NConv	20	NConv	Add Redunctane Relay
	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	61	69	155	59	61	65	62	6	70	10	62	Continue to Monitor
	P5-5A:A2:2:_ FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	62	67	NConv	58	62	211	54	6	70	10	54	Continue to Monitor
	P1-2:A2:67:_ LAKEVILLE #1 60KV [7360]	P1	N-1	76	82	113	51	55	71	55	14	84	35	55	Continue to Monitor

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				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
Fulton - Calistoga 60 kV (Fulton Sub 60 kV to St. Helena Jct 60 kV)	P5-5A:A2.2: *FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	100	97	NConv	51	54	75	59	11	104	35	59	Add Redunctane Relay
Tulucay - Napa #2 60 kV (Tulucay 60 kV to Basalt 60 kV)	Base Case	P0	Base case	104	46	49	61	39	40	84	20	46	77	84	Project: Tulucay-Napa #2 60 kV line Reconductoring project
	P1-2:A2:68:_TULUCAY-NAPA #1 60KV [8180] MOAS OPENED ON TULCAY1_TULCY JT	P1	N-1	117	59	65	75	51	52	95	26	60	87	95	Project: Tulucay-Napa #2 60 kV line Reconductoring project
	P1-2:A2:70:_TULUCAY-NAPA #1 60KV [8180] MOAS OPENED ON TULCY JT_CRD-JCT	P1	N-1	114	58	63	73	50	51	92	25	59	84	92	Project: Tulucay-Napa #2 60 kV line Reconductoring project
Eagle Rock- Fulton- Silverado 115 kV (Eagle rock sub to Ricon Jct Jct2 115 kV)	P5-5A:A2.1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	106	100	121	66	63	71	97	62	101	82	97	Add Redunctane Relay
	P5-5A:A2.2: *FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	128	108	NConv	81	74	87	91	50	111	84	91	Add Redunctane Relay
LAKEVILLE #2 60 kV (Petaluma Jct 60 kV to Petaluma A)	P1-2:A2:65:_LAKEVILLE-PETALUMA C 60KV [7350]	P1	N-1	74	77	113	56	59	82	62	14	78	34	62	Continue to Monitor
	P5-5A:A2.1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0	0	199	0	0	93	0	0	0	0	0	Continue to Monitor
	P5-5A:A2.8:_FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0	0	237	0	0	184	0	0	0	0	0	Continue to Monitor
	P5-5A:A2.9:_FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0	0	241	0	0	186	0	0	0	0	0	Continue to Monitor
LAKEVILLE #2 60KV	P5-5A:A2.1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NA	NA	295	NA	NA	140	NA	NA	NA	NA	NA	Add Redunctane Relay
	P5-5A:A2.8:_FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NA	NA	351	NA	NA	276	NA	NA	NA	NA	NA	Add Redunctane Relay
	P5-5A:A2.9:_FULTON BUS 115 KV 1 & 2 SECTION E/F(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NA	NA	358	NA	NA	281	NA	NA	NA	NA	NA	Add Redunctane Relay
	P5-5A:A2.2: *FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	NA	NA	NConv	NA	NA	139	NA	NA	NA	NA	NA	Add Redunctane Relay
LAKEVILLE 230/60 kV Bank # 3	P1-3:A2:6:_LAKEVILLE 230/60KV TB 5	P1	N-1	64	30	56	60	63	98	148	74	35	109	148	Operating Solution
	P2-2:A2:13:_LAKEVILLE 230KV SECTION 1D	P2-2	Bus	64	30	57	60	63	99	148	73	35	109	148	Operating Solution
	P2-4:A2:3:_LAKEVILLE 230KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	64	35	57	60	63	99	148	72	38	109	148	Operating Solution
	P2-4:A2:4:_LAKEVILLE 230KV - SECTION 1D & 1E	P2-4	Bus-Tie-Breaker	64	29	60	60	63	102	148	71	38	109	148	Continue to Monitor
Cortina - Mendocino 115 kV Line	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	68	65	NConv	63	69	98	48	17	67	17	48	Continue to Monitor
	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	78	76	NConv	74	81	110	55	15	78	23	55	Continue to Monitor
	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	78	76	NConv	74	81	110	55	15	78	23	55	Continue to Monitor
	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	67	66	118	63	68	85	52	5	67	32	52	Continue to Monitor
	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	77	75	NConv	73	80	110	54	15	77	23	54	Continue to Monitor
	P5-5A:A2.2: *FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	85	75	NConv	79	78	102	54	11	77	31	54	Continue to Monitor
	P5-5c(DC):A2:8: Station DC Battery Supply *EGLE ROCK 115-60KV Batt"	P5	Non-Redundant Relay	79	77	NConv	75	81	111	55	15	79	24	55	Continue to Monitor

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)								Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
	EAGLE ROCK-REDBUD 115KV [1480] & GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	<100	<100	143	<100	<100	104	<100	<100	<100	<100	<100	Continue to Monitor
	GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR & EGLE RCK 115/60KV TB 1	P6	N-1-1	<100	<100	127	<100	<100	108	<100	<100	<100	<100	<100	Continue to Monitor
Eagle Rock - Cortina 115 kV (Highland to Highland Jct2)	P5-5A:A2:1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	71	71	123	68	70	94	46	28	73	13	46	Continue to Monitor
	P5-5A:A2:2:_FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	100	85	NConv	95	90	124	52	40	87	23	52	Continue to Monitor
	FULTON 230/115KV TB 4 & FULTON 230/115KV TB 9	P6	N-1-1	<100	<100	119	<100	<100	<100	<100	<100	<100	<100	<100	Continue to Monitor
Hartley - Clear Lake 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	67	71	142	66	73	105	66	28	72	42	66	Continue to Monitor
Monte Rio - Fulton 60 KV(Wohler Jct 60 Kv to Monte Rio Sub 60 KV)	P1-2:A2:6:1:_FULTON-MOLINO-COTATI 60KV [6910] MOAS OPENED ON SNMA TAP_SNMALDFL	P1	N-1	65	71	104	73	76	88	67	12	73	17	67	Continue to Monitor
	P7-1:A2:12:_FULTON-SANTA ROSA #1 & FULTON-MOLINO-COTATI LINES	P7	DCTL	NA	NA	117	NA	NA	NA	NA	NA	NA	NA	NA	Operating Solution
Sonoma - Pueblo 115 kV	P5-5A:A2:1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	115	116	173	102	102	97	100	13	118	49	100	Add Redunctane Relay
	FULTON 230/115KV TB 9 & FULTON 230/115KV TB 4	P6	N-1-1	116	118	172	<100	103	98	99	<100	121	<100	99	Operating Solution
	P2-4:A2:11:_LAKEVILLE 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	110	111	119	51	51	55	80	21	114	48	80	Under review
	P5-5A:A2:10:_LAKEVILLE 115 KV BUS 182 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	111	111	119	51	51	55	80	21	114	48	80	Add Redunctane Relay
	P5-5A:A2:2:_FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	130	136	NConv	53	54	60	87	21	138	49	87	Add Redunctane Relay
	LAKEVILLE-SONOMA #2 115KV [2070] & LAKEVILLE-SONOMA #1 115KV [2063]	P6	N-1-1	108	109	116	<100	<100	<100	<100	<100	112	<100	<100	Operating Solution
	P7-1:A2:16:_LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	109	109	117	51	52	55	79	21	112	48	79	Operating Solution
Ukiah-Hopland-Cloverdale 115 kV (Ukiah sub 115kv to Hopland Jct 115kv)	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	63	65	108	49	53	67	59	34	66	44	59	Continue to Monitor
	P7-1:A2:23:_EAGLE ROCK -REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	81	84	119	65	69	79	74	40	85	56	74	Continue to Monitor
	P7-1:A2:4:_MENDOCINO-REDBUD & CORTINA-MENDOCINO #1 LINES	P7	DCTL	69	71	101	54	58	66	65	38	72	51	65	Continue to Monitor
FULTON 230/115 kV Bank # 9	CORONA-LAKEVILLE 115KV [4311] & FULTON 230/115KV TB 4	P6	N-1-1	<100	<100	111	<100	<100	<100	<100	<100	<100	<100	<100	Continue to Monitor
FULTON 230/115 kV Bank # 4	CORONA-LAKEVILLE 115KV [4311] & FULTON 230/115KV TB 9	P6	N-1-1	<100	<100	109	<100	<100	<100	<100	<100	<100	<100	<100	Continue to Monitor

2023-2024 ISO Reliability Assessment - Preliminary Study Results

Study Area: PG&E North Coast & North Bay

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
MIDDLTWN 60kV	Base Case	P0	Base Case	0.95	0.94	0.98	0.99	0.99	1.03	0.97	1.04	0.95	0.99	0.97	Project: Clear Lake 60 kV System Reinforcement
CALISTGA 60kV	Base Case	P0	Base Case	0.95	0.95	0.91	0.97	0.96	0.94	0.98	1.03	0.94	0.98	0.98	Switch in Fulton 230kV SVD
LYTNVLE 60kV	P1-2:A2:45:_LAYTONVILLE-WILLITS 60KV [8360]	P1	N-1	0.72	0.86	NA	0.51	0.50	NA	0.77	1.04	0.85	0.87	0.77	Project: Garberville area reinforcement project
COVELO6 60kV	P1-2:A2:45:_LAYTONVILLE-WILLITS 60KV [8360]	P1	N-1	0.71	0.85	NA	0.50	0.49	NA	0.76	1.04	0.84	0.86	0.76	Project: Garberville area reinforcement project
UPPR LKE 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.95	0.94	0.85	0.96	0.96	0.92	0.95	1.02	0.94	0.99	0.95	Continue to Monitor
UPPR LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.94	0.94	0.85	0.96	0.96	0.92	0.95	1.02	0.94	0.99	0.95	Continue to Monitor
HARTLEY 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.93	0.93	0.80	0.94	0.94	0.90	0.93	1.03	0.92	0.99	0.93	Continue to Monitor
HARTLEY 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.93	0.93	0.80	0.94	0.94	0.90	0.93	1.03	0.92	0.99	0.93	Continue to Monitor
CLER LKE 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.92	0.92	0.78	0.94	0.94	0.89	0.93	1.03	0.92	0.98	0.93	Continue to Monitor
CLER LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.92	0.92	0.78	0.94	0.94	0.89	0.93	1.03	0.92	0.98	0.93	Continue to Monitor
GRANITE 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.94	0.94	0.83	0.95	0.95	0.91	0.95	1.03	0.94	0.99	0.95	Continue to Monitor
GRANITE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.94	0.94	0.83	0.95	0.95	0.91	0.95	1.03	0.94	0.99	0.95	Continue to Monitor
KONOCTI6 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.86	0.86	0.69	0.90	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Existing Middletown UVLS
KONOCTI6 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.86	0.86	0.70	0.90	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Existing Middletown UVLS
LOWR LKE 60kV	P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P1	N-1	0.84	0.83	0.67	0.89	0.89	0.86	0.86	1.04	0.82	0.95	0.86	Existing Middletown UVLS
LOWR LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	0.84	0.83	0.67	0.89	0.89	0.86	0.87	1.04	0.82	0.95	0.87	Existing Middletown UVLS
DUNBAR 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	0.92	0.92	0.84	0.98	0.98	0.95	0.95	1.05	0.91	0.99	0.95	Continue to Monitor
ST.HELNA 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	0.94	0.94	0.88	0.99	0.98	0.96	0.97	1.05	0.94	1.00	0.97	Continue to Monitor
CALISTGA 60kV	P1-2:A2:1:_FULTON-GEYSR16-GEYSR12-GEYSR14 230KV [0]	P1	N-1	0.94	0.93	0.89	0.97	0.96	0.93	0.98	1.03	0.93	0.96	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-2:A2:2:_GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230KV [0] MOAS OPENED ON G13TT1_8_SANTAFE	P1	N-1	0.95	0.94	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	0.89	0.88	0.80	0.95	0.94	0.91	0.94	1.04	0.88	0.96	0.94	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-3:A2:1:_FULTON 230/115KV TB 4	P1	N-1	0.95	0.93	0.90	0.97	0.96	0.93	0.98	1.03	0.93	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-3:A2:26:_FULTON 115/60KV TB 1	P1	N-1	0.95	0.94	0.90	0.97	0.96	0.93	0.97	1.03	0.93	0.98	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-3:A2:27:_FULTON 115/60KV TB 2	P1	N-1	0.95	0.94	0.90	0.97	0.96	0.93	0.97	1.03	0.93	0.98	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-3:A2:2:_FULTON 230/115KV TB 9	P1	N-1	0.94	0.93	0.90	0.97	0.96	0.93	0.98	1.02	0.93	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-4:A2:6:_FULTON SVD=V	P1	N-1	0.95	0.95	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.98	0.98	Switch in Fulton 230kV SVD
PENNGRVE 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.90	0.94	0.89	0.92	0.97	0.96	0.89	1.00	0.93	0.94	0.89	Operating Solution
MONROE1 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.84	0.91	0.83	0.89	0.97	0.96	0.82	1.01	0.91	0.90	0.82	Operating Solution
MONROE2 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.84	0.91	0.83	0.89	0.97	0.96	0.82	1.01	0.91	0.90	0.82	Operating Solution
SNTA RSA 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.84	0.91	0.83	0.89	0.97	0.96	0.83	1.01	0.91	0.90	0.83	Operating Solution
STNY PTP 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.86	0.92	0.85	0.90	0.97	0.96	0.84	1.01	0.92	0.91	0.84	Operating Solution

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
STONY PT 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.86	0.92	0.85	0.90	0.97	0.96	0.84	1.00	0.92	0.91	0.84	Operating Solution
BELLVUE 115kV	P2-4:A2:7:_FULTON 115KV - SECTION 2D & 1D	P2-4	Bus-Tie-Breaker	0.87	0.92	0.85	0.90	0.97	0.96	0.85	1.00	0.92	0.92	0.85	Operating Solution
SONOMA 115kV	P2-4:A2:11:_LAKEVILLE 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.74	0.74	0.74	1.00	1.01	0.98	0.84	1.07	0.73	0.90	0.84	Operating Solution
WILLITS 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.95	0.94	0.48	0.92	0.91	0.58	0.96	1.04	0.93	0.98	0.96	Operating Solution
LYTNVLE 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.92	0.91	0.44	0.87	0.87	0.55	0.94	1.03	0.91	0.96	0.94	New reactive device
COVELO6 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.91	0.90	0.42	0.87	0.87	0.54	0.93	1.04	0.90	0.96	0.93	New reactive device
HARTLEY 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.94	0.93	NConv	0.96	0.94	0.90	0.93	1.03	0.92	0.99	0.93	Continue to Monitor
HARTLEY 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.94	0.93	NConv	0.96	0.94	0.90	0.93	1.03	0.92	0.99	0.93	Continue to Monitor
CLER LKE 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.93	0.92	NConv	0.95	0.94	0.89	0.93	1.03	0.91	0.98	0.93	Continue to Monitor
CLER LKE 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.93	0.92	NConv	0.95	0.94	0.89	0.93	1.03	0.91	0.98	0.93	Continue to Monitor
CLER LKE 60kV	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	0.93	0.92	NConv	0.95	0.94	0.89	0.93	1.03	0.92	0.98	0.93	Continue to Monitor
KONOCI6 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.88	0.86	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Existing Middletown UVLS
KONOCI6 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.88	0.86	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Existing Middletown UVLS
KONOCI6 60kV	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	0.88	0.86	NConv	0.92	0.90	0.87	0.88	1.04	0.85	0.96	0.88	Existing Middletown UVLS
KONOCI6 60kV	P2-3:A2:27:_EGLE RCK - MA 115KV & EGLE RCK-HOMSTKTP-CORTINA LINE	P2-3	Non-Bus-Tie Breaker	0.87	0.86	NConv	0.92	0.91	NConv	0.90	1.04	0.86	0.96	0.90	Existing Middletown UVLS
LOWR LKE 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.85	0.83	NConv	0.91	0.89	0.85	0.87	1.04	0.82	0.95	0.87	Existing Middletown UVLS
LOWR LKE 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.85	0.83	NConv	0.91	0.89	0.85	0.87	1.04	0.82	0.95	0.87	Existing Middletown UVLS
LOWR LKE 60kV	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	0.85	0.83	NConv	0.91	0.89	0.86	0.86	1.04	0.82	0.95	0.86	Existing Middletown UVLS
LOWR LKE 60kV	P2-3:A2:27:_EGLE RCK - MA 115KV & EGLE RCK-HOMSTKTP-CORTINA LINE	P2-3	Non-Bus-Tie Breaker	0.84	0.83	NConv	0.91	0.90	NConv	0.88	1.04	0.83	0.95	0.88	Existing Middletown UVLS
MIDDLTWN 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.81	0.79	NConv	0.89	0.87	0.85	0.84	1.04	0.78	0.93	0.84	Existing Middletown UVLS
MIDDLTWN 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.81	0.79	NConv	0.89	0.87	0.85	0.84	1.04	0.78	0.93	0.84	Existing Middletown UVLS
MIDDLTWN 60kV	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	0.81	0.78	NConv	0.89	0.87	0.86	0.84	1.04	0.78	0.93	0.84	Existing Middletown UVLS
MIDDLTWN 60kV	P2-3:A2:27:_EGLE RCK - MA 115KV & EGLE RCK-HOMSTKTP-CORTINA LINE	P2-3	Non-Bus-Tie Breaker	0.80	0.79	NConv	0.89	0.88	NConv	0.86	1.04	0.79	0.93	0.86	Existing Middletown UVLS
MIDDLTWN 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.94	0.93	0.78	0.97	0.97	0.96	0.96	1.04	0.93	0.98	0.96	Existing Middletown UVLS
EGLE RCK 60kV	P2-2:A2:21:_EGLE RCK 115KV SECTION MA	P2-2	Bus	0.88	0.86	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Operating Solution
EGLE RCK 60kV	P2-3:A2:25:_EGLE RCK - MA 115KV & EGLE RCK-FULTON-SILVERDO LINE	P2-3	Non-Bus-Tie Breaker	0.88	0.86	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Operating Solution

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
EGLE RCK 60kV	P2-3:A2:26:_EGLE RCK - MA 115KV & EAGLE ROCK-REDBUD LINE	P2-3	Non-Bus-Tie Breaker	0.88	0.86	NConv	0.92	0.90	0.87	0.88	1.04	0.85	0.96	0.88	Operating Solution
EGLE RCK 60kV	P2-3:A2:27:_EGLE RCK - MA 115KV & EGLE RCK-HOMSTKTP-CORTINA LINE	P2-3	Non-Bus-Tie Breaker	0.87	0.86	NConv	0.92	0.91	NConv	0.90	1.04	0.86	0.96	0.90	Operating Solution
PUEBLO 115kV	P2-4:A2:11:_LAKEVILLE 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.78	0.79	0.78	1.01	1.01	0.99	0.86	1.07	0.78	0.93	0.86	Operating Solution
CALISTGA 60kV	P2-1:A2:2:_GEYSERS #12-FULTON 230KV [4750] (CR1T3 18-FULTON)	P2-1	"Line Section w/o Fault	0.94	0.93	0.89	0.97	0.96	0.93	0.98	1.03	0.93	0.96	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-2:A2:5:_NCPA2 230KV SECTION 1D	P2-2	Bus	0.94	0.93	0.89	0.97	0.96	0.93	0.98	1.03	0.93	0.96	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-3:A2:11:_FULTON 230KV - MIDDLE BREAKER BAY 1	P2-3	Non-Bus-Tie Breaker	0.95	0.94	0.90	0.97	0.96	0.93	0.97	1.02	0.93	0.97	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-3:A2:2:_GEYSR18 - 1D 230KV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 LINE	P2-3	Non-Bus-Tie Breaker	0.95	0.94	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-3:A2:5:_SANTAFE - 1D 230KV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 LINE	P2-3	Non-Bus-Tie Breaker	0.95	0.94	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-3:A2:6:_GEYSR13 - 1D 230KV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 LINE	P2-3	Non-Bus-Tie Breaker	0.95	0.94	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-3:A2:7:_GEYSR20 - 1D 230KV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 LINE	P2-3	Non-Bus-Tie Breaker	0.95	0.94	0.90	0.97	0.96	0.94	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-4:A2:11:_LAKEVILLE 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.95	0.93	0.89	0.97	0.97	0.94	0.97	1.03	0.93	0.97	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P2-4:A2:5:_MENDOCNO 115KV - SECTION 1D & 2D	P2-4	Bus-Tie-Breaker	0.95	0.95	0.89	0.97	0.96	0.93	0.98	1.03	0.94	0.98	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P1-1:A2:14:_GEYSER17 13.80KV GEN UNIT 1 & P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P3	G-1/N-1	0.89	0.87	0.79	NA	NA	NA	NA	NA	0.87	NA	NA	Switch in Fulton 230kV SVD
COVELO6 60kV	P1-1:A2:18:_POTTRVLY 2.40KV GEN UNIT 1 & P1-2:A2:43:_MENDOCINO-WILLITS-FORT BRAGG 60KV [7550] MOAS OPENED ON FRT BRGG_BIG RIVR	P3	G-1/N-1	NA	NA	0.90	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
DUNBAR 60kV	P1-1:A2:14:_GEYSER17 13.80KV GEN UNIT 1 & P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P3	G-1/N-1	NA	NA	0.84	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
EGLE RCK 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P3	G-1/N-1	NA	NA	0.70	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
GUALALA 60kV	P1-1:A2:6:_GEYSR5-6 13.80KV GEN UNIT 2 & P1-2:A2:61:_FULTON-MOLINO-COTATI 60KV [6910] MOAS OPENED ON SNMA TAP_SNMALDFL	P3	G-1/N-1	NA	NA	0.87	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
HARTLEY 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P3	G-1/N-1	NA	NA	0.80	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
KONOCTI6 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P3	G-1/N-1	NA	NA	0.69	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor

2023-2024 ISO Reliability Assessment - Preliminary Study Results

Study Area: PG&E North Coast & North Bay

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
LOWR LKE 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P3	G-1/N-1	NA	NA	0.66	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
LYTNVLE 60kV	P1-1:A6:6:_MONTICLO 9.11KV GEN UNIT 3 & P1-2:A2:45:_LAYTONVILLE-WILLITS 60KV [8360]	P3	G-1/N-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.86	NA	Continue to Monitor
MIDDLTWN 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P3	G-1/N-1	NA	NA	0.62	0.87	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
ST.HELNA 60kV	P1-1:A2:14:_GEYSER17 13.80KV GEN UNIT 1 & P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P3	G-1/N-1	NA	NA	0.87	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
UPPR LKE 60kV	P1-1:A2:15:_GEYSER18 13.80KV GEN UNIT 1 & P1-2:A2:56:_KONOCTI-EAGLE ROCK 60KV [6861]	P3	G-1/N-1	NA	NA	0.85	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
CR1T3_18 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.88	0.94	NConv	0.99	0.99	0.97	0.97	1.02	0.92	1.00	0.97	Add Redunctane Battery
G14CRT15 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
GEYSR12 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
GEYSR14 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
G16T0_2 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
GEYSR16 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
NCPA2 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.94	NConv	1.00	1.00	0.98	0.98	1.02	0.93	1.00	0.98	Add Redunctane Battery
BOTTLERK 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.86	0.91	NConv	0.99	0.99	0.95	0.96	1.02	0.89	1.00	0.96	Add Redunctane Battery
GEYSR17 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.86	0.91	NConv	0.99	0.99	0.95	0.96	1.02	0.89	1.00	0.96	Add Redunctane Battery
FULTON 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.84	0.89	NConv	0.97	0.97	0.93	0.93	1.03	0.87	0.99	0.93	Add Redunctane Battery
IGNACIO 230kV	P5-5c(DC):A2:8: Station DC Battery Supply "EGLE ROCK 115-60kV Batt"	P5	Non-Redundant Relay	0.88	0.90	NConv	0.96	0.96	0.92	0.95	1.01	0.89	0.98	0.95	Add Redunctane Battery
PENNGRVE 115kV	P5-5A:A2:1:_FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.90	0.92	0.74	0.93	0.95	0.95	0.90	1.01	0.92	0.94	0.90	Add Redunctane Relay

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
PENNGRVE 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.90	0.94	0.90	0.92	0.97	0.96	0.89	1.00	0.94	0.93	0.89	Add Redunctane Relay
PENNGRVE 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.78	0.87	NConv	0.99	1.01	0.96	0.90	1.08	0.85	0.98	0.90	Add Redunctane Relay
FULTON 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.86	0.58	0.91	0.94	0.92	0.83	1.01	0.86	0.91	0.83	Add Redunctane Relay
FULTON 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.01	0.96	0.94	1.07	0.87	1.01	0.94	Add Redunctane Relay
MONROE1 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.87	0.59	0.91	0.94	0.92	0.83	1.01	0.87	0.91	0.83	Add Redunctane Relay
MONROE1 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.92	0.84	0.89	0.98	0.96	0.82	1.01	0.91	0.90	0.82	Add Redunctane Relay
MONROE1 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.81	0.88	NConv	1.00	1.01	0.96	0.92	1.08	0.87	1.00	0.92	Add Redunctane Relay
MONROE2 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.87	0.59	0.91	0.94	0.92	0.83	1.01	0.87	0.91	0.83	Add Redunctane Relay
MONROE2 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.81	0.88	NConv	0.99	1.01	0.96	0.92	1.08	0.87	0.99	0.92	Add Redunctane Relay
SNTA RSA 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.87	0.60	0.91	0.94	0.93	0.83	1.01	0.87	0.91	0.83	Add Redunctane Relay
SNTA RSA 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.84	0.92	0.84	0.89	0.98	0.96	0.83	1.00	0.91	0.90	0.83	Add Redunctane Relay
SNTA RSA 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.80	0.88	NConv	0.99	1.01	0.96	0.91	1.08	0.86	0.99	0.91	Add Redunctane Relay
STNY PTP 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.86	0.89	0.64	0.91	0.95	0.93	0.85	1.01	0.88	0.92	0.85	Add Redunctane Relay
STNY PTP 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.86	0.92	0.86	0.89	0.97	0.96	0.84	1.00	0.92	0.91	0.84	Add Redunctane Relay
STNY PTP 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.79	0.88	NConv	0.99	1.01	0.96	0.90	1.08	0.86	0.99	0.90	Add Redunctane Relay
STONY PT 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.86	0.89	0.64	0.91	0.94	0.93	0.85	1.01	0.88	0.92	0.85	Add Redunctane Relay
STONY PT 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.86	0.92	0.86	0.89	0.97	0.96	0.84	1.00	0.92	0.91	0.84	Add Redunctane Relay

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
STONY PT 115kV	P5-5A:A2:8:_ FULTON BUS 115 KV 1 & 2 SECTION D(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.79	0.88	NConv	0.99	1.01	0.96	0.90	1.08	0.86	0.99	0.90	Add Redunctane Relay
BELLVUE 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.87	0.89	0.66	0.92	0.95	0.93	0.86	1.01	0.89	0.93	0.86	Add Redunctane Relay
RINCON 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.85	0.87	0.57	0.92	0.95	0.93	0.85	1.02	0.87	0.92	0.85	Add Redunctane Relay
CORONA 115kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.82	0.96	0.97	0.96	0.95	1.00	0.95	0.97	0.95	Add Redunctane Relay
SONOMA 115kV	P5-5A:A2:10:_ LAKEVILLE 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.74	0.74	0.74	1.00	1.01	0.98	0.84	1.07	0.73	0.90	0.84	Add Redunctane Relay
WILLITS 60kV	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.95	0.96	0.50	0.92	0.91	0.58	0.95	1.04	0.96	0.97	0.95	Add Redunctane Relay
LYTNVLE 60kV	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.92	0.93	0.45	0.87	0.87	0.55	0.93	1.03	0.93	0.96	0.93	Add Redunctane Relay
COVELO6 60kV	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.91	0.92	0.44	0.87	0.87	0.54	0.93	1.03	0.92	0.96	0.93	Add Redunctane Relay
HARTLEY 60kV	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	0.95	0.93	0.55	0.96	0.95	0.91	0.93	1.03	0.92	0.99	0.93	Add Redunctane Relay
HARTLEY 60kV	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.94	0.92	NConv	0.96	0.94	0.90	0.93	1.03	0.92	0.99	0.93	Add Redunctane Relay
CLER LKE 60kV	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	0.94	0.92	0.53	0.96	0.94	0.90	0.93	1.03	0.91	0.98	0.93	Add Redunctane Relay
CLER LKE 60kV	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.94	0.92	NConv	0.95	0.94	0.89	0.93	1.03	0.92	0.98	0.93	Add Redunctane Relay
KONOCIT6 60kV	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	0.88	0.86	0.47	0.92	0.91	0.88	0.88	1.04	0.85	0.96	0.88	Add Redunctane Relay
KONOCIT6 60kV	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.88	0.85	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Add Redunctane Relay
LOWR LKE 60kV	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	0.86	0.83	0.44	0.91	0.89	0.88	0.87	1.04	0.82	0.95	0.86	Add Redunctane Relay
LOWR LKE 60kV	P5-5A:A2:7:_EAGLE ROCK 115KV(FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	0.86	0.83	NConv	0.91	0.89	0.85	0.86	1.04	0.82	0.95	0.86	Add Redunctane Relay
MIDDLTWN 60kV	P4-2:A2:1:_NO BF RELAY EAGLE ROCK 115KV CB 142	P5	Non-Redundant Relay	0.82	0.78	0.41	0.89	0.87	0.88	0.84	1.04	0.77	0.93	0.84	Add Redunctane Relay

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
MIDDLTWN 60kV	P5-5A:A2:11:_ MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.94	0.93	0.81	0.98	0.97	0.95	0.96	1.04	0.93	0.98	0.96	Add Redunctane Relay
MIDDLTWN 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.94	0.55	0.99	0.99	1.03	0.96	1.04	0.95	0.99	0.96	Add Redunctane Relay
MIDDLTWN 60kV	P5-5A:A2:7:_ EAGLE ROCK 115KV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.81	0.78	NConv	0.89	0.87	0.85	0.84	1.05	0.78	0.93	0.84	Add Redunctane Relay
EGLE RCK 60kV	P5-5A:A2:7:_ EAGLE ROCK 115KV(FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.88	0.85	NConv	0.92	0.90	0.86	0.88	1.04	0.85	0.96	0.88	Add Redunctane Relay
GUALALA 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.84	0.86	0.41	0.88	0.91	0.82	0.79	1.05	0.86	0.98	0.79	Add Redunctane Relay
ANNAPOLS 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.87	0.44	0.90	0.93	0.85	0.81	1.05	0.87	0.98	0.81	Add Redunctane Relay
FORT RSS 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.88	0.46	0.91	0.94	0.87	0.82	1.05	0.88	0.98	0.81	Add Redunctane Relay
SLMN CRK 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.88	0.46	0.91	0.94	0.88	0.82	1.05	0.88	0.97	0.82	Add Redunctane Relay
MONTE RO 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.87	0.89	0.49	0.93	0.96	0.91	0.83	1.04	0.89	0.98	0.83	Add Redunctane Relay
MONTE RO 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.86	0.92	NConv	1.01	1.00	0.94	0.96	1.05	0.90	1.04	0.96	Add Redunctane Battery
WOHLER 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.88	0.91	0.56	0.96	0.99	0.96	0.86	1.04	0.91	0.97	0.86	Add Redunctane Relay
WOHLER 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.87	0.94	NConv	1.04	1.03	0.99	0.98	1.05	0.91	1.04	0.98	Add Redunctane Battery
MIRABEL 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.88	0.91	0.55	0.96	0.99	0.95	0.86	1.04	0.91	0.97	0.86	Add Redunctane Relay
MIRABEL 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.87	0.93	NConv	1.04	1.03	0.98	0.98	1.05	0.91	1.04	0.98	Add Redunctane Battery
MOLINO 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.88	0.56	0.95	0.98	0.95	0.83	1.04	0.88	0.96	0.83	Add Redunctane Relay
MOLINO 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.91	NConv	1.03	1.02	0.93	0.96	1.05	0.89	1.03	0.96	Add Redunctane Battery
GYSRVILLE 60kV	P5-5A:A2:1:_ FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.88	0.52	0.95	0.98	0.95	0.85	1.03	0.88	0.95	0.85	Add Redunctane Relay

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
GYSRVILLE 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.84	0.90	NConv	1.01	1.01	0.97	0.96	1.04	0.88	1.01	0.96	Add Redunctane Battery
GYSR 1-2 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.88	0.53	0.95	0.98	0.95	0.85	1.03	0.88	0.95	0.85	Add Redunctane Relay
GYSR 1-2 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.84	0.90	NConv	1.01	1.02	0.97	0.96	1.03	0.88	1.01	0.96	Add Redunctane Battery
WINDSOR 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.89	0.55	0.96	0.99	0.96	0.86	1.03	0.89	0.95	0.86	Add Redunctane Relay
WINDSOR 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.91	NConv	1.02	1.03	0.98	0.97	1.04	0.89	1.02	0.97	Add Redunctane Battery
FULTON 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.89	0.91	0.59	0.97	1.00	0.97	0.88	1.04	0.91	0.97	0.88	Add Redunctane Relay
FULTON 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.88	0.94	NConv	1.05	1.04	1.00	1.00	1.05	0.92	1.04	1.00	Add Redunctane Battery
FTCH MTN 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.88	0.54	0.95	0.98	0.95	0.85	1.03	0.88	0.95	0.85	Add Redunctane Relay
FTCH MTN 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.84	0.91	NConv	1.02	1.02	0.98	0.96	1.04	0.89	1.01	0.96	Add Redunctane Battery
FTCHMTNP 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.86	0.89	0.54	0.95	0.98	0.96	0.86	1.03	0.89	0.95	0.86	Add Redunctane Relay
FTCHMTNP 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.91	NConv	1.02	1.02	0.98	0.97	1.04	0.89	1.01	0.97	Add Redunctane Battery
LAGUNA 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.84	0.87	0.61	0.93	0.96	0.95	0.82	1.04	0.87	0.95	0.82	Add Redunctane Relay
LAGUNA 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.90	NConv	1.01	1.01	0.86	0.95	1.05	0.87	1.02	0.95	Add Redunctane Battery
COTATI 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.84	0.86	0.65	0.92	0.96	0.95	0.81	1.04	0.86	0.96	0.81	Add Redunctane Relay
COTATI 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.00	0.81	0.94	1.05	0.87	1.03	0.94	Add Redunctane Battery
SNMALDFL 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.84	0.86	0.65	0.93	0.96	0.95	0.81	1.04	0.86	0.96	0.81	Add Redunctane Relay
SNMALDFL 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.00	0.82	0.94	1.05	0.87	1.03	0.94	Add Redunctane Battery

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
DUNBAR 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.71	0.78	NConv	0.98	0.98	0.90	0.90	1.06	0.75	0.98	0.90	Add Redunctane Battery
SILVERDO 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.87	0.55	0.94	0.96	0.94	0.85	1.03	0.87	0.92	0.85	Add Redunctane Relay
SILVERDO 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.01	0.96	0.95	1.08	0.87	1.00	0.95	Add Redunctane Battery
MONTCLLO 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.87	0.55	0.94	0.96	0.94	0.85	1.03	0.87	0.93	0.85	Add Redunctane Relay
MONTCLLO 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.01	0.96	0.95	1.08	0.87	1.00	0.95	Add Redunctane Battery
MNTCLOPH 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.85	0.87	0.55	0.94	0.96	0.94	0.86	1.04	0.87	0.93	0.86	Add Redunctane Relay
MNTCLOPH 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.83	0.89	NConv	1.01	1.01	0.96	0.95	1.08	0.87	1.00	0.95	Add Redunctane Battery
PUEBLO 115kV	P5-5A:A2:10: LAKEVILLE 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.78	0.79	0.78	1.01	1.01	0.99	0.86	1.07	0.78	0.93	0.86	Add Redunctane Relay
PUEBLO 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.89	0.90	0.73	0.94	0.95	0.94	0.89	1.00	0.90	0.94	0.89	Add Redunctane Relay
PUEBLO 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.57	0.62	NConv	0.96	0.96	0.89	0.80	1.07	0.60	0.91	0.80	Add Redunctane Battery
LS GLLNS 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.92	NConv	1.00	1.00	0.96	0.97	1.06	0.91	1.01	0.97	Add Redunctane Battery
SAN RAFL 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.92	NConv	1.00	1.00	0.96	0.97	1.06	0.90	1.01	0.97	Add Redunctane Battery
SKAGGS 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.90	0.93	NConv	1.00	1.00	0.96	0.97	1.06	0.91	1.02	0.97	Add Redunctane Battery
HIGHWAY 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.86	1.03	1.04	1.01	0.98	1.07	0.95	0.99	0.98	Add Redunctane Relay
HIGHWAY 115kV	P5-5c(DC):A2:1: Station DC Battery Supply "FULTON 230-115-60kV Batt"	P5	Non-Redundant Relay	0.94	0.95	0.88	1.03	1.04	1.01	0.98	1.06	0.95	0.98	0.98	Add Redunctane Battery
HIGHWAY 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.88	NConv	0.99	0.98	0.94	0.95	1.06	0.86	0.98	0.95	Add Redunctane Battery
JMSCNPMP 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.92	NConv	1.00	1.00	0.96	0.97	1.06	0.91	1.01	0.97	Add Redunctane Battery

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
NTWR ALT 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.86	1.03	1.04	1.01	0.98	1.07	0.95	0.99	0.98	Add Redunctane Relay
NTWR ALT 115kV	P5-5c(DC):A2:1: Station DC Battery Supply "FULTON 230-115-60kV Batt"	P5	Non-Redundant Relay	0.94	0.95	0.88	1.03	1.04	1.01	0.97	1.06	0.95	0.98	0.97	Add Redunctane Battery
NTWR ALT 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.87	NConv	0.99	0.98	0.93	0.95	1.06	0.86	0.98	0.95	Add Redunctane Battery
CARQUINZ 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.92	NConv	1.00	1.00	0.96	0.97	1.06	0.91	1.01	0.97	Add Redunctane Battery
MEYERTP1 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.89	0.92	NConv	1.00	1.00	0.96	0.97	1.06	0.91	1.01	0.97	Add Redunctane Battery
MEYERTP2 115kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.86	1.03	1.04	1.01	0.98	1.06	0.95	0.99	0.98	Add Redunctane Relay
MEYERTP2 115kV	P5-5c(DC):A2:1: Station DC Battery Supply "FULTON 230-115-60kV Batt"	P5	Non-Redundant Relay	0.94	0.95	0.88	1.03	1.04	1.01	0.97	1.06	0.95	0.98	0.97	Add Redunctane Battery
MEYERTP2 115kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.85	0.87	NConv	0.99	0.98	0.93	0.95	1.06	0.86	0.98	0.95	Add Redunctane Battery
ST.HELNA 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.82	0.85	0.51	0.93	0.96	0.92	0.84	1.03	0.85	0.93	0.84	Add Redunctane Relay
ST.HELNA 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.74	0.81	NConv	0.99	0.98	0.92	0.92	1.05	0.78	0.99	0.92	Add Redunctane Battery
CALISTGA 60kV	P5-5A:A2:10: LAKEVILLE 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.93	0.89	0.97	0.97	0.94	0.97	1.03	0.93	0.97	0.97	Add Redunctane Relay
CALISTGA 60kV	P5-5A:A2:11: MENDOCINO 115 KV BUS 1&2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.95	0.95	0.90	0.97	0.96	0.93	0.98	1.03	0.94	0.98	0.98	Add Redunctane Relay
CALISTGA 60kV	P5-5A:A2:1: FULTON 230 KV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.76	0.78	0.43	0.89	0.92	0.86	0.80	1.02	0.78	0.89	0.80	Add Redunctane Relay
CALISTGA 60kV	P5-5A:A2:2: FULTON 230 KV BAAH BUS #2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundant Relay	0.94	0.93	0.81	0.97	0.96	0.93	0.95	1.02	0.94	0.97	0.95	Add Redunctane Relay
CALISTGA 60kV	P5-5c(DC):A2:2: Station DC Battery Supply "LAKEVILLE 230-115-60kV Batt"	P5	Non-Redundant Relay	0.67	0.74	NConv	0.95	0.94	0.85	0.88	1.04	0.70	0.95	0.88	Add Redunctane Battery
2365-WD 60kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	0.86	NA	NA	NA	NA	NA	NA	0.86	NA	NA	Continue to Monitor
2606-WD 115kV	P1-2:A2:34: LAKEVILLE-SONOMA #2 115KV [2070] & P1-2:A2:33: LAKEVILLE-SONOMA #1 115KV [2063]	P6	N-1-1	NA	0.76	NA	NA	NA	NA	NA	NA	0.75	NA	NA	Continue to Monitor
AIDLINGYSR 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.70	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
ANNAPOLS 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.26	NA	NA	0.28	NA	0.62	NA	0.39	NA	Continue to Monitor
BELLVUE 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.87	0.89	0.70	NA	NA	NA	0.86	NA	0.89	NA	0.86	Operating Solution
BIG RIVR 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.49	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
CALISTGA 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.25	NA	NA	0.29	NA	0.58	NA	0.32	NA	Continue to Monitor
CALPELLA 115kV	P1-2:A2:11: MENDOCINO-UKIAH 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	0.76	0.74	0.50	0.80	0.80	0.72	0.76	0.88	0.74	0.83	0.76	Continue to Monitor
CARQUINZ 115kV	P1-3:A6:5: IGNACIO 230/115KV TB 6 & P1-2:A6:20: JAMESON CANYON PUMPING PLANT TAP 115KV [1833] MOAS OPENED ON SKGGS J1_HGHWY J1	P6	N-1-1	NA	NA	0.90	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
CLER LKE 60kV	P1-3:A2:25: EGLE RCK 115/60KV TB 1 & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	0.90	0.90	0.47	NA	NA	0.57	NA	NA	0.90	NA	NA	Operating Solution
CLOVRDLE 115kV	P1-2:A2:11: MENDOCINO-UKIAH 115KV [2420] MOAS OPENED ON MENDOCNO_CALPELLA & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	0.77	0.76	0.53	0.81	0.81	0.73	0.77	0.89	0.76	0.84	0.77	Operating Solution
CORONA 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.86	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
COTATI 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.52	NA	NA	0.55	NA	0.62	NA	0.38	NA	Continue to Monitor
COVELO6 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.49	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
DUNBAR 60kV	P1-4:A2:6: FULTON SVD=V & P1-2:A2:67: LAKEVILLE #1 60KV [7360]	P6	N-1-1	NA	NA	0.82	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
EGLE RCK 60kV	P1-3:A2:25: EGLE RCK 115/60KV TB 1 & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	0.84	0.41	NA	NA	0.52	NA	NA	0.83	NA	NA	Continue to Monitor
ELK 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.50	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor

2023-2024 ISO Reliability Assessment - Preliminary Study Results

Study Area: PG&E North Coast & North Bay

Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
FORT RSS 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.27	NA	NA	0.29	NA	0.62	NA	0.39	NA	Continue to Monitor
FRT BRGG 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.48	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
FTCH MTN 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.34	NA	NA	0.38	NA	0.61	NA	0.41	NA	Continue to Monitor
FTCHMTNP 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.36	NA	NA	0.39	NA	0.62	NA	0.42	NA	Continue to Monitor
FULTON 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.34	NA	NA	0.38	NA	0.61	NA	0.39	NA	Continue to Monitor
GARCIA 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.50	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
GEYSERS34 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.70	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
GEYSERS56 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.70	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
GEYSR11 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.71	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
GRANITE 60kV	P1-3:A2:25: EGLE RCK 115/60KV TB 1 & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.52	NA	NA	0.61	NA	NA	NA	NA	NA	Continue to Monitor
GUALALA 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.24	NA	NA	0.26	NA	0.63	NA	0.39	NA	Continue to Monitor
GYSR 1-2 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.34	NA	NA	0.38	NA	0.61	NA	0.41	NA	Continue to Monitor
GYSRVLL 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.34	NA	NA	0.38	NA	0.61	NA	0.40	NA	Continue to Monitor
HARTLEY 60kV	P1-3:A2:25: EGLE RCK 115/60KV TB 1 & P1-2:A2:42: MENDOCINO-HARTLEY 60KV [7510]	P6	N-1-1	0.85	0.85	0.48	0.88	0.87	0.51	0.87	NA	0.84	NA	0.87	Operating Solution
HIGHLAND 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.79	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
HIGHWAY 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.89	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
HOMEGRND 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.77	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
HOMEPROC 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.77	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
INDIN VL 115kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.85	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
KONOCIT6 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1 & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	0.84	0.41	NA	NA	0.52	NA	NA	0.83	NA	NA	Continue to Monitor
LAGUNA 60kV	P1-3:A2:27:_FULTON 115/60KV TB 2 & P1-3:A2:26:_FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.44	NA	NA	0.47	NA	0.61	NA	0.37	NA	Continue to Monitor
LAKEVILLE 115kV	P1-3:A2:4:_LAKEVILLE 230/115KV TB 2 & P1-3:A2:3:_LAKEVILLE 230/115KV TB 1	P6	N-1-1	0.89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Operating Solution
LOWR LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1 & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	0.81	0.40	NA	NA	0.51	NA	NA	NA	NA	NA	Continue to Monitor
LUCERNE 115kV	P1-2:A2:21:_EAGLE ROCK-REDBUD 115KV [1480] & P1-2:A2:18:_CORTINA-MENDOCINO #1 115KV [1330] MOAS OPENED ON LUCERNJ1_LUCERNE	P6	N-1-1	NA	NA	0.57	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
LYTNVILLE 60kV	P1-2:A2:24:_EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.50	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
MASONITE 60kV	P1-2:A2:24:_EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.61	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
MCDWLLSW 60kV	P1-3:A2:6:_LAKEVILLE 230/60KV TB 5 & P1-3:A2:5:_LAKEVILLE 230/60KV TB 3	P6	N-1-1	NA	NA	NA	NA	NA	0.47	NA	NA	NA	NA	NA	Continue to Monitor
MENDOCNO 115kV	P1-2:A2:24:_EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.58	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
MEYERTP2 115kV	P1-3:A2:2:_FULTON 230/115KV TB 9 & P1-3:A2:1:_FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.89	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
MIDDLTWN 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1 & P1-2:A2:15:_GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	0.76	0.37	NA	NA	0.49	NA	NA	NA	NA	NA	Operating Solution
MIRABEL 60kV	P1-3:A2:27:_FULTON 115/60KV TB 2 & P1-3:A2:26:_FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.31	NA	NA	0.35	NA	0.62	NA	0.39	NA	Continue to Monitor
MNTCLOPH 115kV	P1-3:A2:2:_FULTON 230/115KV TB 9 & P1-3:A2:1:_FULTON 230/115KV TB 4	P6	N-1-1	0.85	0.87	0.58	NA	NA	NA	0.86	NA	0.87	NA	0.86	Operating Solution
MOLINO 60kV	P1-3:A2:27:_FULTON 115/60KV TB 2 & P1-3:A2:26:_FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.36	NA	NA	0.40	NA	0.62	NA	0.38	NA	Continue to Monitor
MONROE1 115kV	P1-3:A2:2:_FULTON 230/115KV TB 9 & P1-3:A2:1:_FULTON 230/115KV TB 4	P6	N-1-1	0.84	0.86	0.63	NA	NA	NA	0.83	NA	0.86	NA	0.83	Operating Solution
MONROE2 115kV	P1-3:A2:2:_FULTON 230/115KV TB 9 & P1-3:A2:1:_FULTON 230/115KV TB 4	P6	N-1-1	0.83	0.86	0.62	NA	NA	NA	0.83	NA	0.86	NA	0.83	Operating Solution
MONTCLO 115kV	P1-3:A2:2:_FULTON 230/115KV TB 9 & P1-3:A2:1:_FULTON 230/115KV TB 4	P6	N-1-1	0.85	0.87	0.58	NA	NA	NA	0.86	NA	0.87	NA	0.86	Operating Solution

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
MONTE RO 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.29	NA	NA	0.32	NA	0.62	NA	0.39	NA	Continue to Monitor
NTWR ALT 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	NA	NA	0.89	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
PENNGRVE 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.90	NA	0.78	NA	NA	NA	0.90	NA	NA	NA	0.90	Operating Solution
PETLMA A 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.70	NA	NA	0.71	NA	NA	NA	NA	NA	Continue to Monitor
PETLMA C 60kV	P1-3:A2:6: LAKEVILLE 230/60KV TB 5 & P1-3:A2:5: LAKEVILLE 230/60KV TB 3	P6	N-1-1	NA	NA	NA	NA	NA	0.46	NA	NA	NA	NA	NA	Continue to Monitor
PHILO 60kV	P1-4:A2:5: BIG RIVR SVD=V & P1-2:A2:41: MENDOCINO-PHILO JCT-HOPLAND 60KV [7520] MOAS OPENED ON PHILO JCT HPLND JT	P6	N-1-1	NA	NA	0.50	NA	0.90	0.46	NA	NA	NA	NA	NA	Continue to Monitor
PNT ARNA 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.50	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
PTTR VLY 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.61	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
PUEBLO 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.89	0.90	0.77	NA	NA	NA	0.89	NA	0.90	NA	0.89	Operating Solution
Q1700 60kV	P1-3:A2:6: LAKEVILLE 230/60KV TB 5 & P1-3:A2:5: LAKEVILLE 230/60KV TB 3	P6	N-1-1	NA	NA	NA	NA	NA	0.48	NA	NA	NA	NA	NA	Continue to Monitor
REDBUD 115kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.56	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
RINCON 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.85	0.87	0.61	NA	NA	NA	0.85	NA	0.87	NA	0.85	Switch in Fulton 230kV SVD
SILVERDO 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.85	0.87	0.59	NA	NA	NA	0.85	NA	0.87	NA	0.85	Switch in Fulton 230kV SVD
SLMN CRK 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.27	NA	NA	0.30	NA	0.62	NA	0.39	NA	Continue to Monitor
SNMALDFL 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.52	NA	NA	0.55	NA	0.62	NA	0.38	NA	Continue to Monitor
SNTA RSA 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.84	0.87	0.64	NA	NA	NA	0.84	NA	0.87	NA	0.84	Operating Solution
SONOMA 115kV	P1-2:A2:34: LAKEVILLE-SONOMA #2 115KV [2070] & P1-2:A2:33: LAKEVILLE-SONOMA #1 115KV [2063]	P6	N-1-1	0.75	0.76	0.76	NA	NA	NA	0.85	NA	0.75	NA	0.85	Operating Solution
ST.HELNA 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.29	NA	NA	0.33	NA	0.60	NA	0.36	NA	Continue to Monitor
STNY PTP 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.86	0.88	0.68	NA	NA	NA	0.85	NA	0.88	NA	0.85	Operating Solution
STONY PT 115kV	P1-3:A2:2: FULTON 230/115KV TB 9 & P1-3:A2:1: FULTON 230/115KV TB 4	P6	N-1-1	0.86	0.88	0.68	NA	NA	NA	0.85	NA	0.88	NA	0.85	Operating Solution

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
UKIAH 115kV	P1-2:A2:11: MENDOCINO-UKIAH 115KV [2420] MOAS OPENED ON MENDOCINO_CALPELLA & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	0.76	0.74	0.51	0.80	0.80	0.72	0.76	0.88	0.74	0.83	0.76	Operating Solution
UPPR LKE 60kV	P1-3:A2:25: EGGLE ROCK 115/60KV TB 1 & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.54	NA	NA	0.63	NA	NA	NA	NA	NA	Continue to Monitor
WILLITS 60kV	P1-2:A2:24: EAGLE ROCK-REDBUD 115KV [1480] (2) & P1-2:A2:15: GEYSERS #3-CLOVERDALE 115KV [1650] MOAS OPENED ON AIDLINJCT_AIDLINGYSR	P6	N-1-1	NA	NA	0.55	NA	NA	NA	NA	NA	NA	NA	NA	Continue to Monitor
WINDSOR 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.34	NA	NA	0.38	NA	0.61	NA	0.40	NA	Continue to Monitor
WOHLER 60kV	P1-3:A2:27: FULTON 115/60KV TB 2 & P1-3:A2:26: FULTON 115/60KV TB 1	P6	N-1-1	NA	NA	0.32	NA	NA	0.36	NA	0.61	NA	0.39	NA	Continue to Monitor
PENNGRVE 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.90	0.94	0.89	0.92	0.97	0.96	0.89	1.00	0.94	0.93	0.89	Operating Solution
MONROE1 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.84	0.92	0.83	0.89	0.97	0.96	0.82	1.01	0.91	0.89	0.83	Operating Solution
MONROE2 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.84	0.91	0.83	0.89	0.97	0.96	0.82	1.01	0.91	0.89	0.83	Operating Solution
SNTA RSA 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.84	0.92	0.83	0.89	0.97	0.96	0.82	1.01	0.91	0.89	0.83	Operating Solution
STNY PTP 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.86	0.92	0.85	0.90	0.97	0.96	0.84	1.01	0.92	0.91	0.85	Operating Solution
STONY PT 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.86	0.92	0.85	0.89	0.97	0.96	0.84	1.01	0.92	0.91	0.85	Operating Solution
BELLVUE 115kV	P7-1:A2:15: FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	0.87	0.93	0.85	0.90	0.97	0.96	0.85	1.01	0.92	0.91	0.86	Operating Solution
SONOMA 115kV	P7-1:A2:16: LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	0.75	0.76	0.76	1.00	1.00	0.98	0.85	1.06	0.75	0.90	0.85	Operating Solution
PUEBLO 115kV	P7-1:A2:16: LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	0.80	0.81	0.80	1.01	1.00	0.99	0.87	1.06	0.80	0.93	0.87	Operating Solution
CALISTGA 60kV	P7-1:A2:10: FULTON-IGNACIO #1 & FULTON-LAKEVILLE LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.96	0.93	0.98	1.02	0.94	0.98	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A2:11: GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.97	0.94	0.97	1.02	0.94	0.97	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A2:16: LAKEVILLE-SONOMA #1 & LAKEVILLE-SONOMA #2 LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.96	0.94	0.97	1.03	0.93	0.97	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A2:21: FULTON - HOPLAND 60 KV & GEYSER 12 - FULTON & GEYSER 17 - FULTON 230 KV LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.96	0.93	0.96	1.03	0.93	0.97	0.96	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A2:6: GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	0.95	0.93	0.90	0.96	0.96	0.93	0.98	1.03	0.94	0.97	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A6:10: LAKEVILLE-SOBRAANTE #2 & IGNACIO-SOBRAANTE 230KV LINES	P7	DCTL	0.94	0.93	0.90	0.97	0.97	0.93	0.98	1.03	0.93	0.98	0.98	Switch in Fulton 230kV SVD

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
CALISTGA 60kV	P7-1:A6:17:_IGNACIO-SOBRANTE 230KV & LAKEVILLE-SOBRANTE #2 230KV & IGNACIO-MARE ISLAND #1 115KV LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.97	0.93	0.98	1.03	0.93	0.98	0.98	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A6:20:_VACA- LAKEVILLE #1 & TULUCAY - VACA 230 KV LINE	P7	DCTL	0.95	0.94	0.90	0.97	0.97	0.93	0.97	1.03	0.94	0.98	0.97	Switch in Fulton 230kV SVD
CALISTGA 60kV	P7-1:A6:2:_LAKEVILLE-IGNACIO #1 & IGNACIO-SOBRANTE LINES	P7	DCTL	0.94	0.94	0.90	0.97	0.97	0.93	0.98	1.03	0.93	0.98	0.98	Switch in Fulton 230kV SVD
ALTO 60kV	P7-1:A6:6:_IGNACIO-ALTO-SAUSALITO #2 & IGNACIO-ALTO-SAUSALITO #1 LINES	P7	DCTL	0.94	0.94	0.90	0.95	0.94	0.94	0.93	1.05	0.94	0.99	0.93	Operating Solution

2023-2024 ISO Reliability Assessment - Preliminary Study Results

Study Area: PG&E North Coast & North Bay

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
				2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	
CALISTGA 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	< 8	< 8	11	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
CLER LKE 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	< 8	< 8	20	< 8	< 8	11	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
CLER LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	< 8	< 8	20	< 8	< 8	11	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
COVELO6 60kV	P1-2:A2:45:_LAYTONVILLE-WILLITS 60KV [8360]	P1	N-1	26	12	< 8	44	46	< 8	21	12	13	21	< 8	Project: Garberville area reinforcement project
DUNBAR 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	< 8	< 8	15	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
EGLE RCK 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	17	17	33	< 8	< 8	17	15	< 8	18	15	< 8	Operating Solution
GRANITE 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	< 8	< 8	16	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
GRANITE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	< 8	< 8	15	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
HARTLEY 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	< 8	< 8	16	< 8	< 8	10	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
HARTLEY 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	< 8	< 8	16	< 8	< 8	9	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
KONOCI6 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	14	15	30	< 8	11	16	13	< 8	15	13	< 8	Existing Middletown UVLS
KONOCI6 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	14	15	30	< 8	< 8	16	12	< 8	15	12	< 8	Existing Middletown UVLS
LOWR LKE 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	15	15	32	11	12	17	13	< 8	16	13	< 8	Existing Middletown UVLS
LOWR LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	15	15	32	11	11	17	13	< 8	16	13	< 8	Existing Middletown UVLS
LYTNVLE 60kV	P1-2:A2:45:_LAYTONVILLE-WILLITS 60KV [8360]	P1	N-1	25	11	< 8	44	46	< 8	20	12	12	21	< 8	Project: Garberville area reinforcement project
MIDDLTWN 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	15	16	36	12	12	18	13	< 8	17	13	< 8	Existing Middletown UVLS
MIDDLTWN 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	15	16	35	11	12	17	13	< 8	17	13	< 8	Existing Middletown UVLS
ST.HELNA 60kV	P1-2:A2:67:_LAKEVILLE #1 60KV [7360]	P1	N-1	< 8	< 8	10	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
UPPR LKE 60kV	P1-2:A2:56:_KONOCI-EAGLE ROCK 60KV [6861]	P1	N-1	< 8	< 8	13	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor
UPPR LKE 60kV	P1-3:A2:25:_EGLE RCK 115/60KV TB 1	P1	N-1	< 8	< 8	13	< 8	< 8	< 8	< 8	< 8	< 8	< 8	< 8	Continue to Monitor

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2025 Spring Off-Peak	2028 Summer Peak	2035 Summer Peak	2028 SP High CEC Forecast	2025 OP Sensitivity	
In accordance with TPL-001-4- Requirement R2.6, this area relies on the past studies from the 2019-20 Transmission Planning Process for transient stability studies:								
http://www.caiso.com/Documents/AppendixC-BoardApprovedt2019-2020TransmissionPlan.pdf								

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)													Potential Mitigation Solutions
			2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 Summer-Off Peak	2035 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	

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

Substation	Load Served (MW)													Potential Mitigation Solutions
	2025 Summer Peak	2028 Summer Peak	2035 Summer Peak	2025 Winter Peak	2028 Winter Peak	2035 Winter Peak	2025 Spring Off-Peak	2028 Spring Off-Peak	2028 Summer-Off Peak	2035 Spring Off-Peak	2028 SP High CEC Forecast	2025 SP Heavy Renewable & Min Gas Gen	2025 OP Sensitivity	

No single source substation with more than 100 MW