2024-2025 ISO Reliability Assessment - Preliminary Study Results
Study Area: PG&E North Valley
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Benton-Deschutes 60 kV Line	P1-2:A3:42:_CASCADE-COTTONWOOD 115KV [1240]	P1	N-1	67	21	86	80	82	99	102	77	21	Sensitivity Only
	P2-1:A3:48:_CASCADE-COTTONWOOD 115KV [1240] (COTWDPGE-JESSUPJ1)	P2	Bus/Breaker	50	NA	NA	NA	86	NA	112	82	NA	Sensitivity Only
	P2-1:A3:50:_CASCADE-COTTONWOOD 115KV [1240] (CASCADE-OREGNTRL)	P2	Bus/Breaker	67	22	86	80	82	99	102	77	21	Sensitivity Only
	P2-2:A3:34:_COTWDPGE 115KV SECTION 2D	P2	Bus/Breaker	43	NA	NA	NA	93	NA	110	87	NA	Sensitivity Only
	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	37	109	152	NA	216	NA	NA	35	Continue to monitor
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	37	109	152	NA	216	NA	NA	36	Continue to monitor
	P2-3:A3:33:_COTWDPGE - 2D 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	43	NA	NA	NA	93	NA	110	87	NA	Sensitivity Only
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	12	50	127	234	203	306	112	187	50	Continue to monitor
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	37	109	152	NA	216	NA	NA	35	Continue to monitor
	P2-4:A3:29:_COTWD_2D SECTION 2D & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	7	79	110	NA	151	NA	NA	7	Generation Re-dispatch
	P5-5(DC):A3:24:_Cottonwood 115kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	32	50	87	140	48	164	46	45	50	Add Redundant Battery
	P5-5(DC):A3:3:_Cottonwood 230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	63	35	NConv	35	46	NConv	Add Redundant Battery
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	63	36	NConv	35	46	NConv	Add Redundant relay
	P5-5:A3:11:_COTTONWOOD 115KV BUS 1/BUS 2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	51	87	141	134	164	82	127	51	Add Redundant relay
	P1-1:A3:99:_COLUSAPPCTG1 18.00KV & COLUSAPPCTG2 18.00KV & COLUSAPPSTG1 18.00KV GEN UNITS & P1-2:A3:42:_CASCADE-COTTONWOOD 115KV [1240]	P3	N-1/G-1	<100	<100	<100	92	<100	100	97	<100	<100	Generation re-dispatch
Butte-Sycamore Creek 115 kV Line	P1-2:A3:53:_TABLE MTN-BUTTE #1 115KV [3910] & P1-2:A3:51:_SYCAMORE CREEK-NOTRE DAME-TABLE MTN 115KV [4314]	P6	N-1-1	<100	<100	111	<100	<100	<100	<100	<100	<100	Continue to monitor
Caribou No.11 230/115/60 kV Transformer	P5-5:A3:7:_TABLE MTN 230KV BUS SECTION D/E (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	0	NConv	0	1	0	NConv	0	0	Add Redundant relay
Caribou-Plumas Jct 60 kV Line	P5-5:A3:7:_TABLE MTN 230KV BUS SECTION D/E (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	0	NConv	0	17	0	NConv	25	0	Add Redundant relay
Caribou-Westwood 60 kV Line	P5-5:A3:7:_TABLE MTN 230KV BUS SECTION D/E (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	0	NConv	0	32	0	NConv	144	0	Add Redundant relay
Cascade-Benton-Deschute 60 kV line	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	22	49	74	NA	103	NA	NA	21	Generation Re-dispatch
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	22	49	74	NA	103	NA	NA	21	Generation Re-dispatch
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	10	28	57	112	100	145	57	93	28	Generation Re-dispatch
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	22	49	74	NA	103	NA	NA	21	Generation Re-dispatch
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	26	22	NConv	10	26	NConv	Add Redundant relay
Cascade-Cottonwood 115 kV Line	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	64	22	61	81	74	108	25	66	22	Generation Re-dispatch
	P5-5(DC):A3:3:_Cottonwood 230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	93	72	NConv	18	66	NConv	Add Redundant Battery
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	93	72	NConv	18	66	NConv	Add Redundant relay
	P1-3:A3:15:_COTWD_E 230/60KV TB 3 & P1-3:A3:14:_COTWD_E2 230/60KV TB 2	P6	N-1-1	<100	<100	119	<100	<100	78	<100	<100	<100	Continue to monitor
Cascade-Craig View 115 kV Line (Path 25)	P5-5(DC):A3:1:_Round Mtn 500-230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	50	23	13	NA	77	NConv	Add Redundant Battery
	P5-5(DC):A3:3:_Cottonwood 230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	106	43	NConv	NA	31	NConv	Add Redundant Battery
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NA	NA	NA	NA	NA	24	NA	NA	Add Redundant relay
	P1-3:A3:83:_JESSUP 115/25KV TB 1	P1	N-1	NA	NA	128	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-1:A3:48:_CASCADE-COTTONWOOD 115KV [1240] (COTWDPGE-JESSUPJ1)	P2	Bus/Breaker	80	NA	NA	NA	107	NA	119	108	NA	Generation Re-dispatch
	P2-2:A3:34:_COTWDPGE 115KV SECTION 2D	P2	Bus/Breaker	71	NA	NA	NA	115	NA	116	114	NA	Generation Re-dispatch
	P2-3:A3:115:_COTWD_2D - 2D 115KV & CASCADE-COTTONWOOD LINE	P2	Bus/Breaker	NA	83	128	91	NA	93	NA	NA	82	continue to monitor
	P2-3:A3:33:_COTWDPGE - 2D 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	71	NA	NA	NA	115	NA	116	115	NA	Generation Re-dispatch
	P2-3:A3:34:_COTWDPGE - 2D 115KV & CASCADE-COTTONWOOD LINE	P2	Bus/Breaker	94	NA	NA	NA	109	NA	102	108	NA	Generation Re-dispatch
	P2-4:A3:29:_COTWD_2D SECTION 2D & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	63	97	131	NA	160	NA	NA	64	Generation Re-dispatch
	P2-4:A3:8:_COTWDPGE 115KV - SECTION 2D & 1D	P2	Bus/Breaker	NConv	NA	NA	NA	182	NA	94	179	NA	Generation Re-dispatch

2024-2025 ISO Reliability Assessment - Preliminary Study Results
Study Area: PG&E North Valley
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Cascade-Deschutes 60 kV Line	P5-5(DC):A3:14:_Jessup 115kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	55	82	128	92	50	92	28	53	82	Add Redundant Battery
	P5-5(DC):A3:24:_Cottonwood 115kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	57	118	128	179	57	184	31	60	119	Add Redundant Battery
	P5-5(DC):A3:3:_Cottonwood 230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	97	39	NConv	66	57	NConv	Add Redundant Battery
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	97	41	NConv	66	58	NConv	Add Redundant relay
	P5-5:A3:11:_COTTONWOOD 115KV BUS 1/BUS 2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	120	129	179	173	184	79	170	121	Add Redundant relay
	P1-1:A3:99:_COLUSAPPCTG1 18.00KV & COLUSAPPCTG2 18.00KV & COLUSAPPSTG1 18.00KV GEN UNITS & P1-3:A3:83:_JESSUP 115/25KV TB 1	P3	N-1/G-1	<100	<100	134	<100	<100	<100	<100	<100	<100	Continue to monitor
Coleman-Red Bluff 60 kV Line	P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P1	N-1	152	66	78	5	69	17	59	69	67	Project:Red Bluff-Coleman 60 kV Reinforcement Project
	P1-1:A3:66:_SOUTH G 4.16KV GEN UNIT 1 & P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P3	N-1/G-1	154	<100	<100	<100	<100	<100	<100	<100	<100	Project:Red Bluff-Coleman 60 kV Reinforcement Project
Cottonwood-Benton No.1 60 kV Line	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	58	31	115	108	82	155	38	74	32	Continue to monitor
	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	35	103	69	NA	113	NA	NA	36	Continue to monitor
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	35	103	69	NA	113	NA	NA	36	Continue to monitor
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	35	103	69	NA	113	NA	NA	36	Continue to monitor
	P5-5(DC):A3:3:_Cottonwood 230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	30	23	NConv	18	29	NConv	Add Redundant Battery
	P5-5:A3:10:_COTTONWOOD 230KV BUS SECTION E/G/WAPA/F (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	30	23	NConv	18	29	NConv	Add Redundant relay
	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	<100	<100	116	44	<100	58	<100	<100	<100	Continue to monitor
Cottonwood-Benton No.2 60 kV Line	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	20	4	61	88	72	119	39	66	4	Generation Re-dispatch
Cottonwood-BRNY_FST 230 kV	P5-5(DC):A3:1:_Round Mtn 500-230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	NConv	NConv	37	84	85	71	85	NConv	Add Redundant Battery
Cottonwood-Round Mountain 230 kV Line	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	126	62	14	44	52	NConv	72	126	Add Redundant Battery
Cottonwood-Roundmountain 230kV line 2	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	151	75	16	52	63	NConv	85	151	Add Redundant Battery
Humboldt-Trinity 115 kV Line	P1-2:A3:39:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P1	N-1	60	57	0	100	98	95	31	87	58	Generation Re-dispatch
Keswick-Cascade 60 kV Line	P5-5(DC):A3:24:_Cottonwood 115kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	47	67	52	157	10	154	30	8	69	Add Redundant Battery
	P5-5:A3:11:_COTTONWOOD 115KV BUS 1/BUS 2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	70	52	158	150	154	91	130	72	Add Redundant relay
Round Mountain 500/230 kV Bank	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	73	12	6	107	119	NConv	30	73	Add Redundant Battery
Round Mountain-Cottonwood(E) No.3 230 kV Line	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	NConv	165	81	18	57	68	NConv	94	165	Add Redundant Battery
Sycamore Creek-Notre Dame-Table Mountain 115 kV Line	P2-1:A3:72:_BUTTE-SYCAMORE CREEK 115KV [1190] (CHICOTP2-BUTTE)	P2	Bus/Breaker	92	93	117	9	43	30	35	43	95	Continue to monitor
	P2-2:A3:45:_BUTTE 115KV SECTION MD	P2	Bus/Breaker	92	94	118	9	43	30	35	43	95	Continue to monitor
	P2-3:A3:47:_BUTTE - MD 115KV & TABLE MTN-BUTTE #1 LINE	P2	Bus/Breaker	116	118	147	11	54	32	50	55	120	Project:Table Mountain 115 kV RAS (proposed)
	P2-4:A3:12:_BUTTE 115KV - SECTION MD & ME	P2	Bus/Breaker	95	97	124	9	43	30	35	43	98	Continue to monitor
	P2-2:A3:49:_TBLE MTN 115KV SECTION 1D	P2	Bus/Breaker	86	88	101	10	39	21	38	39	90	Continue to monitor
	P2-3:A3:51:_TBLE MTN - 1D 115KV & TABLE MTN-BUTTE #1 LINE	P2	Bus/Breaker	86	88	101	10	39	21	38	39	89	Continue to monitor
	P1-2:A3:54:_TABLE MTN-BUTTE #2 115KV [3920] & P1-2:A3:53:_TABLE MTN-BUTTE #1 115KV [3910]	P6	N-1-1	<100	<100	104	<100	<100	<100	<100	<100	<100	Continue to monitor
Table Mountain No.3 230/115 kV Transformer	P2-2:A3:28:_TABLE MTN D 230KV SECTION 1D	P2	Bus/Breaker	NConv	108	NConv	19	5	69	NConv	24	108	Project: Table mountain 115kV RAS(proposed) modify to add the Table Mountain bank
	P2-3:A3:26:_TABLE MTN D - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	106	116	19	5	70	NConv	24	106	Project: Table mountain 115kV RAS(proposed) modify to add the Table Mountain bank
	P2-3:A3:27:_TABLE MTN D - 1D 230KV & LINE	P2	Bus/Breaker	NConv	NA	NA	NA	90	NA	NConv	90	NA	Project: Table mountain 115kV RAS(proposed) modify to add the Table Mountain bank

2024-2025 ISO Reliability Assessment - Preliminary Study Results
Study Area: PG&E North Valley
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)						Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
Table Mountain-Butte No.1 115 kV Line	P1-2:A3:51:_SYCAMORE CREEK-NOTRE DAME-TABLE MTN 115KV [4314] & P1-2:A3:54: _TABLE MTN-BUTTE #2 115KV [3920]	P6	N-1-1	103	105	121	<100	<100	<100	<100	<100	106	Project:Table Mountain 115 kV RAS proposed
	P1-2:A3:54:_TABLE MTN-BUTTE #2 115KV [3920] & P1-2:A3:51:_SYCAMORE CREEK-NOTRE DAME-TABLE MTN 115KV [4314]	P6	N-1-1	118	120	138	<100	<100	<100	<100	<100	122	Project:Table Mountain 115 kV RAS proposed
Table Mountain-Butte No.2 115 kV Line	P1-2:A3:53:_TABLE MTN-BUTTE #1 115KV [3910] & P1-2:A3:51:_SYCAMORE CREEK-NOTRE DAME-TABLE MTN 115KV [4314]	P6	N-1-1	117	119	138	<100	<100	<100	<100	<100	121	Project:Table Mountain 115 kV RAS proposed
Table Mountain-Paradise 115 kV Line	P2-2:A3:49:_TBLE MTN 115KV SECTION 1D	P2	Bus/Breaker	87	89	101	10	40	21	39	40	91	Continue to monitor
	P2-3:A3:51:_TBLE MTN - 1D 115KV & TABLE MTN-BUTTE #1 LINE	P2	Bus/Breaker	87	89	101	10	40	21	38	40	90	Continue to monitor
	P1-2:A3:54:_TABLE MTN-BUTTE #2 115KV [3920] & P1-2:A3:53:_TABLE MTN-BUTTE #1 115KV [3910]	P6	N-1-1	<100	<100	101	<100	<100	<100	<100	<100	<100	Continue to monitor
Trinity-Cottonwood 115kkV line	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	NA	29	31	82	NA	103	NA	NA	30	Generation Re-dispatch
Trinity-Keswick 60 kV Line	P2-4:A3:8: COTWDPGE 115KV - SECTION 2D & 1D	P2	Bus/Breaker	NConv	NA	NA	NA	161	NA	79	141	NA	under review
	P5-5(DC):A3:24:_Cottonwood 115kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	16	84	18	163	23	153	16	20	85	Add Redundant Battery
	P5-5:A3:11:_COTTONWOOD 115KV BUS 1/BUS 2 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	87	18	164	165	154	76	145	88	Add Redundant relay
Volta-South 60 kV Line	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	14	3	40	77	74	101	42	63	3	Generation Re-dispatch
Westwood 60kV line	P5-5(DC):A3:1:_Round Mtn 500-230kV Batt (Failure of Station DC Battery Supply)	P5	Non-Redundent battery supply/Relay	15	18	NConv	20	14	20	16	108	18	Add Redundant Battery
	P5-5:A3:7:_TABLE MTN 230KV BUS SECTION D/E (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent battery supply/Relay	NConv	0	NConv	0	46	0	NConv	60	0	Add Redundant relay

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
CARBOU M 230 kV	P1-1:A3:111:_CARIBOU 1-25 25.00KV GEN UNIT VB & P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P3	N-1/G-1	NA	NA	0.46	>0.9	NA	>0.9	NA	NA	NA	Continue to monitor
	P1-2:A3:42:_CASCADE-COTTONWOOD 115KV [1240] & P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P6	N-1-1	NA	NA	0.46	NA	0.52	NA	NA	0.49	NA	Continue to monitor
	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-redundant relay/Battery	NConv	NA	0.59	NA	0.97	NA	NConv	0.95	NA	Continue to monitor
	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	NConv	NA	0.56	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-1:A3:21:_CARIBOU-TABLE MTN 230KV [4440] (CARIBOU-BELDENTP)	P2	Bus/Breaker	NConv	NA	0.57	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-2:A3:21:_CARIBOU 230KV SECTION 1D	P2	Bus/Breaker	NConv	NA	0.46	NA	0.97	NA	NConv	0.96	NA	Continue to monitor
	P2-3:A3:21:_CARIBOU - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.46	NA	0.97	NA	NConv	0.96	NA	Continue to monitor
	P2-3:A3:26:_TABLE MTN D - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.57	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
CARIBOU 115 kV	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-redundant relay/Battery	NConv	NA	0.59	NA	0.97	NA	NConv	0.95	NA	Continue to monitor
	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	NConv	NA	0.56	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-1:A3:21:_CARIBOU-TABLE MTN 230KV [4440] (CARIBOU-BELDENTP)	P2	Bus/Breaker	NConv	NA	0.57	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-2:A3:21:_CARIBOU 230KV SECTION 1D	P2	Bus/Breaker	NConv	NA	0.46	NA	0.97	NA	NConv	0.96	NA	Continue to monitor
	P2-3:A3:21:_CARIBOU - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.46	NA	0.97	NA	NConv	0.96	NA	Continue to monitor
	P2-3:A3:26:_TABLE MTN D - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.57	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
CARIBOU 230 kV	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-redundant relay/Battery	NConv	NA	0.60	NA	0.97	NA	NConv	0.95	NA	Continue to monitor
	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	NConv	NA	0.57	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-1:A3:21:_CARIBOU-TABLE MTN 230KV [4440] (CARIBOU-BELDENTP)	P2	Bus/Breaker	NConv	NA	0.58	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P2-3:A3:26:_TABLE MTN D - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.58	NA	0.96	NA	NConv	0.96	NA	Continue to monitor
	P1-1:A3:111:_CARIBOU 1-25 25.00KV GEN UNIT VB & P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P3	N-1/G-1	NA	NA	0.45	>0.9	NA	>0.9	NA	NA	NA	Continue to monitor
	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440] & P1-3:A3:4:_CARIBOU 230/230KV TB 11	P6	N-1-1	NA	NA	0.45	NA	NA	NA	NA	NA	NA	Continue to monitor
	P5-5(DC):A3:2:_Table Mtn 500-230-115-60kV Batt (Failure of Station DC Battery Supply)	P5	Non-redundant relay/Battery	NConv	NA	0.57	NA	0.95	NA	NConv	0.93	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
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
CARIBOU 60 kV	P5-5:A3:12:_CARIBOU PH #2 230 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-redundant relay/Battery	NConv	NA	0.45	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P5-5:A3:2:_CARIBOU 230 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-redundant relay/Battery	NConv	NA	0.45	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	NConv	NA	0.55	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P2-1:A3:21:_CARIBOU-TABLE MTN 230KV [4440] (CARIBOU-BELDENTP)	P2	Bus/Breaker	NConv	NA	0.55	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P2-2:A3:21:_CARIBOU 230KV SECTION 1D	P2	Bus/Breaker	NConv	NA	0.45	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P2-3:A3:21:_CARIBOU - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.45	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
	P2-3:A3:26:_TABLE MTN D - 1D 230KV & CARIBOU-TABLE MTN LINE	P2	Bus/Breaker	NConv	NA	0.55	NA	0.95	NA	NConv	0.94	NA	Continue to monitor
CLMN JCT 60 kV	P1-1:A3:66:_SOUTH G 4.16KV GEN UNIT 1 & P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P3	N-1/G-1	0.88	NA	NA	>0.9	NA	>0.9	NA	NA	NA	Project:Red Bluff-Coleman 60 kV Reinforcement Project
	P1-3:A3:15:_COTWD_E 230/60KV TB 3 & P1-3:A3:14:_COTWD_E2 230/60KV TB 2	P6	N-1-1	0.84	0.87	0.57	NA	NA	NA	NA	NA	0.86	Operating solution
	P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P1	N-1	0.89	0.95	0.92	1.05	1.04	1.05	0.97	1.03	0.94	Project:Red Bluff-Coleman 60 kV Reinforcement Project
COTTONWD 60 kV	P1-3:A3:14:_COTWD_E2 230/60KV TB 2 & P1-3:A3:15:_COTWD_E 230/60KV TB 3	P6	N-1-1	0.89	NA	0.63	NA	NA	NA	NA	NA	NA	Operating solution
COTWD_1D 115 kV	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	NA	NA	0.74	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	NA	1.03	0.73	1.04	NA	1.02	NA	NA	1.03	Continue to monitor
COTWD_1E 115 kV	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	NA	NA	0.74	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	NA	1.03	0.73	1.04	NA	1.02	NA	NA	1.03	Continue to monitor
COTWD_2D 115 kV	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	NA	NA	0.74	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	1.06	0.74	1.08	NA	1.06	NA	NA	1.06	Continue to monitor
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	1.06	0.74	1.08	NA	1.06	NA	NA	1.06	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	NA	1.03	0.73	1.04	NA	1.02	NA	NA	1.03	Continue to monitor
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	1.06	0.74	1.08	NA	1.06	NA	NA	1.06	Continue to monitor

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
COTWD_2E 115 kV	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	NA	NA	0.74	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	NA	1.03	0.73	1.04	NA	1.02	NA	NA	1.03	Continue to monitor
COTWD_E2 230kV	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	1.00	1.00	0.69	1.04	1.00	1.00	1.03	1.00	0.99	Continue to monitor
DESCHSJCT 60 kV	P1-3:A3:15:_COTWD_E 230/60KV TB 3 & P1-3:A3:14:_COTWD_E2 230/60KV TB 2	P6	N-1-1	NA	NA	0.77	NA	NA	NA	NA	NA	NA	Continue to monitor
DESCHSJCT1 60kV	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	1.01	1.02	0.90	1.04	1.04	1.03	1.04	1.04	1.02	Continue to monitor
DESCHUTS 60 kV	P1-3:A3:15:_COTWD_E 230/60KV TB 3 & P1-3:A3:14:_COTWD_E2 230/60KV TB 2	P6	N-1-1	NA	NA	0.79	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	1.00	1.02	0.88	1.04	1.03	1.02	1.03	1.03	1.02	Continue to monitor
OREGNTRL 115 kV	P1-3:A3:8:_COTWD_F2 230/115KV TB 4 & P1-3:A3:7:_COTWD_E2 230/115KV TB 1	P6	N-1-1	NA	NA	0.76	NA	NA	NA	NA	NA	NA	Continue to monitor
	P2-1:A3:214:_CASCADE-COTTONWOOD 115KV [1240] (COTWD_2D-JESSUPJ1)	P2	Bus/Breaker	NA	1.04	0.84	1.08	NA	1.08	NA	NA	1.04	Continue to monitor
	P2-2:A3:88:_COTWD_2D 115KV SECTION 2D	P2	Bus/Breaker	NA	1.04	0.84	1.08	NA	1.08	NA	NA	1.04	Continue to monitor
	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	1.06	0.77	1.08	NA	1.06	NA	NA	1.06	Continue to monitor
	P2-3:A3:114:_COTWD_2D - 2D 115KV & COTTONWOOD-PANORAMA LINE	P2	Bus/Breaker	NA	1.04	0.84	1.08	NA	1.08	NA	NA	1.04	Continue to monitor
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	1.06	0.77	1.08	NA	1.06	NA	NA	1.06	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	1.00	1.03	0.75	1.04	1.01	1.01	1.05	1.02	1.03	Continue to monitor
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	1.06	0.77	1.08	NA	1.06	NA	NA	1.06	Continue to monitor
	P2-4:A3:29:_COTWD_2D SECTION 2D & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	1.04	0.84	1.07	NA	1.07	NA	NA	1.04	Continue to monitor
OREGNTRL 60kV	P2-2:A3:89:_COTWD_2E 115KV SECTION 2E	P2	Bus/Breaker	NA	1.03	0.88	1.05	NA	1.04	NA	NA	1.04	Continue to monitor
	P2-3:A3:116:_COTWD_2E - 2E 115KV & BRIDGEVILLE-COTTONWOOD LINE	P2	Bus/Breaker	NA	1.03	0.88	1.05	NA	1.04	NA	NA	1.04	Continue to monitor
	P2-4:A3:22:_COTWD_F2 SECTION 2F & COTWD_E2 SECTION 2E 230KV	P2	Bus/Breaker	1.00	1.03	0.84	1.03	1.02	1.02	1.03	1.03	1.03	Continue to monitor
	P2-4:A3:28:_COTWD_1E SECTION 1E & COTWD_2E SECTION 2E 115KV	P2	Bus/Breaker	NA	1.03	0.88	1.05	NA	1.04	NA	NA	1.04	Continue to monitor
RED BLFF 60kV	P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P1	N-1	0.85	0.93	0.90	1.05	1.04	1.05	0.96	1.04	0.93	Project:Red Bluff-Coleman 60 kV Reinforcement Project

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)						Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	

2024-2025 ISO Reliability Assessment - Preliminary Study Results
Study Area: PG&E North Valley
Voltage Deviation

Substation	Contingency	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)						Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2029 Summer-Off Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	
CARIBOU 60kV	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	<8	<8	45	<8	<8	<8	<8	<8	<8	Continue to monitor
CARIBOU 115kV	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	<8	<8	46	<8	<8	<8	<8	<8	<8	Continue to monitor
CARIBOU 230kV	P1-2:A3:24:_CARIBOU-TABLE MTN 230KV [4440]	P1	N-1	<8	<8	46	<8	<8	<8	<8	<8	<8	Continue to monitor
CLMN JCT 60kV	P1-2:A3:80:_COTTONWOOD-RED BLUFF 60KV [6660] MOAS OPENED ON RED B JT_RED BLFF	P1	N-1	10	<8	<8	<8	<8	<8	<8	<8	<8	Project:Red Bluff-Coleman 60 kV Reinforcement Project

Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2026 Spring Off-Peak	2029 Summer Peak	2034 Summer Peak	2026 OP Sensitivity	2029 SP High CEC Forecast	
"P5-5a - Failure of non-redundant bus differential relay protecting Substation Bus TBL MT D 230 kV (ALL 230 kV elements clear	P5	Non-redundant relay/battery	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No Issues	No Issues	No Issues	Install redundant relay
"RAS1-P2-2-Bus Fault at COTWD_F 230kV" 1.00 "" "" "" 0	P2	Bus/Breaker	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	Sensitivity only
"RAS1-P2-4-Internal fault at Bus-tie Breaker 412 at COTWD_F 230kV" 1.00 "" "" "" 0	P2	Bus/Breaker	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	Sensitivity only
"RAS1-P4-3-Stuck Breaker 462 protecting Tran TABLE MT 500/230kV bk 1" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	Sensitivity only
"RAS1-P4-5-Stuck non-Bus-tie Breaker 232 protecting Substation Bus COTWD_F 230kV Section F" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	Sensitivity only
"RAS1-P4-2-Stuck Breaker Table Mountain 212 protecting Line TABLE MTN D to PALERMO 230kV ckt 1" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	Sensitivity only
"RAS1-P4-3-Stuck Breaker 462 protecting Tran TABLE MT 500/230kV bk 1" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	Sensitivity only
"RAS1-P4-5-Stuck non-Bus-tie Breaker 232 protecting Substation Bus COTWD_F 230kV Section F" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	Sensitivity only
"RAS1-P4-6-Stuck Bus-tie Breaker 412 protection Substation Bus COTWD_F 230kV Section 1F" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	No Issues	No Issues	Potential WECC/NERC criteria violation	Sensitivity only
"RAS1-P2-4-Internal fault at Bus-tie Breaker 452 at COTWD_F 230kV" 1.00 "" "" "" 0	P2	Bus/Breaker	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	No Issues	Continue to monitor
"RAS1-P4-3-Stuck Breaker 462 protecting Tran TABLE MT 500/230kV bk 1" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	No Issues	Continue to monitor
"RAS1-P4-5-Stuck non-Bus-tie Breaker 232 protecting Substation Bus COTWD_F 230kV Section F" 1.00 "" "" "" 0	P4	Stuck breaker	No Issues	No Issues	Potential WECC/NERC criteria violation	No Issues	No Issues	Continue to monitor

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
			2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2034 Summer Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	

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

2024-2025 ISO Reliability Assessment - Preliminary Study Results
Study Area: **PG&E North Valley**
Single Source Substation with more than 100 MW Load

Substation	Load Served (MW)											Potential Mitigation Solutions
	2026 Summer Peak	2026 Summer Peak	2029 Summer Peak	2034 Summer Peak	2026 Spring Off-Peak	2029 Spring Off-Peak	2029 Summer-Off Peak	2034 Summer Peak	2026 SP Heavy Renewable & Min Gas Gen	2026 OP Sensitivity	2029 SP High CEC Forecast	

No single source substation with more than 100 MW