2026-2027 ISO Reliability Assessment - Study Results
Study Area: PG&E Humboldt
Thermal Overloads

California ISO

Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)									Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Winter Peak	2031 Winter Peak	2041 Winter Peak	2036 Summer-Off Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
BRIDGEVILLE-GARBERVILLE 60KV	BRIDGEVILLE-COTTONWOOD 115KV and HUMBOLDT-TRINITY 115KV	P6	N-1-1	< 100	< 100	< 100	110	< 100	< 100	< 100	102	< 100	101	102	< 100	Project:Garberville Area reinforcement
	BRIDGEVILLE-COTTONWOOD 115KV and HUMBOLDT-TRINITY 115KV	P6	N-1-1	< 100	< 100	< 100	102	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	
FAIRHAVEN-HUMBOLDT 60KV	FAIRHAVN 13.80KV GEN UNIT 1 and ARCATA-HUMBOLDT 60KV	P3	G-1/N-1	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
Fruitland-Fruitland Jct 60 kV	BRIDGEVILLE-COTTONWOOD 115KV and HUMBOLDT-TRINITY 115KV	P6	N-1-1	< 100	< 100	< 100	104	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
GARBERVILLE-LAYTONVILLE 60KV	HUMBOLDT BAY-RIO DELL JCT 60KV and BRDGVLLE 115/60KV TB 1	P6	N-1-1	Diverge	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
HMBLT BY-HARRIS 60KV	HMBOBAYPPA 13.80KV GEN UNIT 1 and HUMBOLDT-EUREKA 60KV	P3	G-1/N-1	< 100	< 100	< 100	< 100	121	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Operating Solution
	HUMBOLDT-EUREKA 60KV	P1	N-1	< 100	< 100	109	< 100	< 100	124	< 100	< 100	< 100	< 100	< 100	< 100	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	< 100	< 100	105	< 100	< 100	Diverge	Diverge	< 100	< 100	< 100	< 100	< 100	Install redundant battery/relay supply
HUMBOLDT BAY-RIO DELL JCT 60KV	BRIDGEVILLE-COTTONWOOD 115KV and HUMBOLDT-BRIDGEVILLE 115KV	P6	N-1-1	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	101	< 100	< 100	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R3 & R2	P2	Breaker	103	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R3	P2	Breaker	103	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R2	P2	Breaker	103	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
HUMBOLDT-BRIDGEVILLE 115KV	BRIDGEVILLE-COTTONWOOD 115KV	P1	N-1	< 100	< 100	100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Continue to monitor
	BRDGVLLE 115KV - RING R1 & R2	P2	Breaker	< 100	< 100	129	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Continue to monitor
HUMBOLDT-MAPLE CREEK 60KV	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	< 100	< 100	Diverge	Diverge	< 100	133	< 100	< 100	< 100	Install redundant battery/relay supply
	BRIDGEVILLE-COTTONWOOD 115KV and HUMBOLDT-TRINITY 115KV	P6	N-1-1	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	101	< 100	< 100	< 100	Operating Solution
	HUMBOLDT 115KV SECTION MA	P2	Bus	< 100	< 100	114	< 100	< 100	< 100	Diverge	< 100	133	< 100	< 100	< 100	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	< 100	< 100	114	< 100	< 100	< 100	Diverge	< 100	133	< 100	< 100	< 100	Continue to monitor
	HUMBOLDT 115KV BATT(FAILLURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	< 100	< 100	Diverge	< 100	< 100	Diverge	Diverge	< 100	136	< 100	< 100	< 100	Install redundant battery/relay supply
RIO DELL JCT-BRIDGEVILLE 60KV	HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	115	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	113	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT 115KV SECTION MA	P2	Bus	< 100	< 100	< 100	105	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT-BRIDGEVILLE 115KV and HUMBOLDT-TRINITY 115KV	P6	N-1-1	< 100	< 100	< 100	100	< 100	< 100	< 100	100	< 100	< 100	100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	107	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT 115KV SECTION MA	P2	Bus	< 100	< 100	< 100	107	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	< 100	< 100	< 100	107	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	< 100	< 100	< 100	105	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	105	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Project:Garberville Area reinforcement
TRINITY-MAPLE CREEK 60KV	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	< 100	< 100	< 100	< 100	< 100	Diverge	Diverge	< 100	121	< 100	< 100	< 100	Install redundant battery/relay supply
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	< 100	< 100	< 100	< 100	< 100	< 100	Diverge	< 100	121	< 100	< 100	< 100	Off-Peak only
	HUMBOLDT 115KV SECTION MA	P2	Bus	< 100	< 100	< 100	< 100	< 100	< 100	Diverge	< 100	121	< 100	< 100	< 100	Off-Peak only
	HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	< 100	< 100	Diverge	< 100	< 100	Diverge	Diverge	< 100	132	< 100	< 100	< 100	Install redundant battery/relay supply
	HUMBOLDT 115/60KV TB 1 and HUMBOLDT 115/60KV TB 2	P6	N-1-1	< 100	Diverge	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	Diverge	Operating Solution

Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)									Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Winter Peak	2031 Winter Peak	2041 Winter Peak	2036 Summer Off Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
ARCATA 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.72	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	NA	NA	0.61	NA	NA	Diverge	NA	NA	Diverge	NA	NA	NA	Install redundant battery/relay supply
BRDGVLLE 115.0 kV	HRCGENSAB 13.80KV GEN UNIT 1 and HUMBOLDT BAY-HUMBOLDT #1 115KV	P3	G-1/N-1	0.90	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Project:Garberville Area reinforcement
	HUMBOLDT-BRIDGEVILLE 115KV and BRIDGEVILLE-COTTONWOOD 115KV	P6	N-1-1	0.85	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R3	P2	Breaker	0.85	NA	NA	0.91	NA	NA	0.91	NA	NA	0.88	0.91	NA	Project:Garberville Area reinforcement
BRDGVLLE 60.0 kV	BRDGVLLE 115/60KV TB 1 and RIO DELL JCT-BRIDGEVILLE 60KV MOAS OPENED ON CARLOTTA SWNS FLT	P6	N-1-1	0.49	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	0.94	> 0.9	> 0.9	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R3 & R2	P2	Breaker	0.89	NA	NA	0.95	NA	NA	0.96	NA	NA	0.93	0.96	NA	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R2	P2	Breaker	0.90	NA	NA	0.95	NA	NA	0.96	NA	NA	0.93	0.96	NA	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R3	P2	Breaker	0.89	NA	NA	0.95	NA	NA	0.96	NA	NA	0.92	0.96	NA	Project:Garberville Area reinforcement
EUREKA 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.72	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115KV SECTION MA	P2	Bus	0.92	1.01	0.78	0.94	0.99	Diverge	0.94	1.00	1.01	0.92	0.94	1.01	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	0.92	1.01	0.78	0.94	0.99	Diverge	0.94	1.00	1.01	0.92	0.94	1.01	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	0.92	1.01	0.61	0.94	0.99	Diverge	0.94	1.00	Diverge	0.92	0.94	1.01	Install redundant battery/relay supply
FAIRHAVN 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.73	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	NA	NA	0.62	NA	NA	Diverge	NA	NA	Diverge	NA	NA	NA	Install redundant battery/relay supply
GRBRVLLE 60.0 kV	HMBOBAYPPA 13.80KV GEN UNIT 1 and BRIDGEVILLE-GARBERVILLE 60KV MOAS OPENED ON BRDGVLLE FRUTLDJT	P3	G-1/N-1	0.58	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Project:Garberville Area reinforcement
	BRDGVLLE 115/60KV TB 1 and RIO DELL JCT-BRIDGEVILLE 60KV MOAS OPENED ON CARLOTTA SWNS FLT	P6	N-1-1	0.53	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Project:Garberville Area reinforcement
	BRIDGEVILLE-GARBERVILLE 60KV MOAS OPENED ON BRDGVLLE_FRUTLDJT	P1	N-1	0.59	NA	NA	1.03	NA	NA	1.03	NA	NA	1.00	1.03	NA	Project:Garberville Area reinforcement
	BRIDGEVILLE-GARBERVILLE 60KV MOAS OPENED ON FTSWRDJT_GRBRVLLE	P1	N-1	0.87	NA	NA	1.03	NA	NA	1.03	NA	NA	1.08	1.03	NA	Project:Garberville Area reinforcement
	BRDGVLLE 115/60KV TB 1	P1	N-1	0.90	NA	NA	1.01	NA	NA	1.02	NA	NA	0.99	1.02	NA	Project:Garberville Area reinforcement
	GRBRVLLE 60.00KV ID=8H & GRBRVLLE 60.00KV ID=7H & GRBRVLLE 60.00KV ID=5H & GRBRVLLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	0.86	1.02	1.01	0.92	1.01	1.02	0.94	1.02	1.03	0.88	0.93	1.02	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R3 & R2	P2	Breaker	0.89	NA	NA	0.97	NA	NA	0.98	NA	NA	0.95	0.98	NA	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R2	P2	Breaker	0.89	NA	NA	0.97	NA	NA	0.98	NA	NA	0.95	0.98	NA	Project:Garberville Area reinforcement
	BRDGVLLE 115KV - RING R1 & R3	P2	Breaker	0.89	NA	NA	0.97	NA	NA	0.98	NA	NA	0.95	0.98	NA	Project:Garberville Area reinforcement
	BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	0.58	NA	NA	1.03	NA	NA	1.03	NA	NA	1.00	1.03	NA	Project:Garberville Area reinforcement
HARRIS 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.72	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115KV SECTION MA	P2	Bus	0.91	1.02	0.78	0.92	1.00	Diverge	0.93	1.00	1.02	0.91	0.93	1.02	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	0.91	1.02	0.78	0.92	1.00	Diverge	0.93	1.00	1.02	0.91	0.93	1.02	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	0.91	1.02	0.61	0.92	1.00	Diverge	0.93	1.00	Diverge	0.91	0.93	1.02	Install redundant battery/relay supply
HMBOBAYPPA 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.75	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115KV SECTION MA	P2	Bus	0.95	1.02	0.82	0.96	1.01	Diverge	0.97	1.01	1.02	0.95	0.97	1.02	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	0.95	1.02	0.82	0.96	1.01	Diverge	0.97	1.01	1.02	0.95	0.97	1.02	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	0.95	1.02	0.65	0.96	1.01	Diverge	0.97	1.01	Diverge	0.95	0.97	1.02	Install redundant battery/relay supply
HUMBOLDT 115.0 kV	HRCGENSAB 13.80KV GEN UNIT 1 and HUMBOLDT BAY-HUMBOLDT #1 115KV	P3	G-1/N-1	0.85	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Project:Garberville Area reinforcement
	HUMB115PST 115/115KV TB 1 and HUMBOLDT BAY-HUMBOLDT #1 115KV	P6	N-1-1	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	0.81	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Generator redispatch
	HUMBOLDT BAY-HUMBOLDT #1 115KV	P1	N-1	0.90	0.96	0.95	0.92	0.94	0.95	0.92	0.97	0.97	0.90	0.92	0.96	Project:Garberville Area reinforcement
	HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	0.90	0.96	0.95	0.92	0.94	0.95	0.92	0.97	0.97	0.90	0.92	0.96	Project:Garberville Area reinforcement
	HUMBOLDT BAY-HUMBOLDT #1 115KV (HMBOBAYPPB-HUMBOLDT)	P2	Line Section w/o Fault	0.90	0.96	0.95	0.92	0.94	0.95	0.92	0.97	0.97	0.90	0.92	0.96	Project:Garberville Area reinforcement
	BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	0.93	0.97	0.96	0.89	0.97	0.97	0.92	0.97	0.98	0.91	0.92	0.97	Install redundant battery/relay supply
HUMBOLDT 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.72	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115KV SECTION MA	P2	Bus	0.91	1.02	0.78	0.92	1.00	Diverge	0.93	1.01	1.02	0.91	0.93	1.02	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	0.91	1.02	0.78	0.92	1.00	Diverge	0.93	1.01	1.02	0.91	0.93	1.02	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	0.91	1.02	0.61	0.92	1.00	Diverge	0.93	1.01	Diverge	0.91	0.93	1.02	Install redundant battery/relay supply
JANS CRK 60.0 kV	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.70	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	NA	NA	0.59	NA	NA	Diverge	NA	NA	Diverge	NA	NA	NA	Install redundant battery/relay supply
MPLE CRK 60.0 kV	FAIRHAVN 13.80KV GEN UNIT 1 and HUMBOLDT-MAPLE CREEK 60KV MOAS OPENED ON HUMBOLDT_MPLE CRK	P3	G-1/N-1	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	0.80	> 0.9	> 0.9	> 0.9	Generator redispatch
	HUMBOLDT 115/60KV TB 2 and HUMBOLDT 60/115KV TB 1	P6	N-1-1	> 0.9	> 0.9	0.73	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	> 0.9	Continue to monitor
	HUMBOLDT-MAPLE CREEK 60KV MOAS OPENED ON HUMBOLDT_MPLE CRK	P1	N-1	0.73	1.02	0.89	0.96	0.99	1.03	0.98	1.03	0.81	0.83	0.98	0.99	Mitigation under development
	HUMBOLDT 115KV SECTION MA	P2	Bus	0.91	1.02	0.75	0.91	1.01	Diverge	0.94	0.95	1.02	0.90	0.94	1.02	Continue to monitor
	HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Breaker	0.91	1.02	0.75	0.91	1.01	Diverge	0.94	0.95	1.02	0.90	0.94	1.02	Continue to monitor
	HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Battery/Relay	0.91	1.02	0.64	0.91	1.01	Diverge	0.94	0.95	Diverge	0.90	0.94	1.02	Install redundant battery/relay supply
	HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant Battery/Relay	0.90	1.01	Diverge	0.90	1.00	Diverge	0.93	0.85	Diverge	0.90	0.93	1.01	Install redundant battery/relay supply

Substation	Contingency	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)									Post Cont. Voltage Deviation % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2028 Winter Peak	2031 Winter Peak	2041 Winter Peak	2036 Summer-Off Peak	2028 Spring Off-Peak	2031 Spring Off-Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	
MPLE CRK 60.0 kV	HUMBOLDT-MAPLE CREEK 60KV	P1	N-1	24	< 8	12	< 8	< 8	22	< 8	< 8	< 8	15	< 8	< 8	Mitigation under development
GRBRVLLE 60.0 kV	BRIDGEVILLE-GARBERVILLE 60KV MOAS OPENED ON BRDGVLLE_FRUTLDJT	P1	N-1	36	Diverge	Diverge	NA	Diverge	Diverge	Diverge	< 8	Diverge	< 8	< 8	Diverge	Project:Garberville Area reinforcement
	BRIDGEVILLE-GARBERVILLE 60KV MOAS OPENED ON FTSWRDJT_GRBRVLLE	P1	N-1	8	Diverge	Diverge	NA	Diverge	Diverge	Diverge	< 8	Diverge	NA	< 8	Diverge	Project:Garberville Area reinforcement
	BRDGVLLE 115/60KV TB 1	P1	N-1	< 8	Diverge	NA	< 8	Diverge	NA	NA	< 8	Diverge	< 8	< 8	Diverge	Project:Garberville Area reinforcement
	GRBRVLLE 60.00KV ID=8H & GRBRVLLE 60.00KV ID=7H & GRBRVLLE 60.00KV ID=5H & GRBRVLLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	10	< 8	< 8	10	< 8	< 8	< 8	10	< 8	13	10	< 8	Project:Garberville Area reinforcement

Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios				Sensitivity Scenarios		
			2028 Spring Off-Peak	2031 Summer Peak	2036 Summer Peak	2036 Summer-Off Peak	2028 Spring OP Sensitivity	2031 SP High CEC Forecast	
P1-2-HBLTUVLS-2-Line HUMBOLDT to BRDGVLLE 115kV ckt 1	P1	N-1	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	Violations at Non-BES buses
P1-2-HBLTUVLS-Line Arcata - Humboldt No.1 60 kV line	P1	N-1	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	Potential WECC/NERC criteria violation	Violations at Non-BES buses
P1-3-HBLTUVLS-3-Tran BRDGVLLE 115-60kV bk 1	P1	N-1	No issues	No issues	No issues	Potential WECC/NERC criteria violation	No issues	No issues	Continue to monitor
P2-2-HBLTUVLS-2-Bus Fault at HUMBOLDT 115kV Main Bus	P2	Bus/Breaker	No issues	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	No issues	Continue to monitor
P2-3-HBLTUVLS-3-Internal fault at non-Bus-tie-Breaker 1012 at BRDGVLLE 115kV	P2	Bus/Breaker	Potential WECC/NERC criteria violation	No issues	No issues	No issues	Potential WECC/NERC criteria violation	No issues	Project:Garberville Area reinforcement
P2-4-HBLTUVLS-4-Internal fault at Bus-tie Breaker 102 at HUMBOLDT 115kV	P2	Bus/Breaker	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	Potential WECC/NERC criteria violation	Violations at Non-BES buses
P3-2-HBLTUVLS-2-Gen HMBOBAYPPC 13.8kV Unit 8 and Line HUMBOLDT to HMBOBAYPPB 115kV ckt 1	P3	G-1/N-1	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	Violations at Non-BES buses
P3-3-HBLTUVLS-3-Gen HMBOBAYPPC 13.8kV Unit 8 and Tran BRDGVLLE 115-60kV bk 1	P3	G-1/N-1	No issues	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	Continue to monitor
P4-1-HBLTUVLS-1-Stuck 115kV Breaker CB 132 protecting Gens at HMBOBAYPPB 13.8kV	P4	Stuck Breaker	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	No issues	Violations at Non-BES buses
P4-2-HBLTUVLS-2-Stuck Breaker Humboldt 182 protecting Line HUMBOLDT to BRDGVLLE 115kV ckt 1	P4	Stuck Breaker	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Violations at Non-BES buses
P4-3-HBLTUVLS-3-Stuck 115kV Breaker 322 protecting Tran HUMBOLDT 115/60kV bk 2	P4	Stuck Breaker	No issues	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	No issues	Continue to monitor
P4-5-HBLTUVLS-5-Stuck non-Bus-tie Breaker 1032 protecting Substation Bus BRDGVLLE 115kV Main Bus	P4	Stuck Breaker	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Criteria Violations observed with 3-Phase Fault Simulations, working with PTO for SLG fault information.
P4-6-HBLTUVLS-6-Stuck Bus-tie Breaker 102 protecting Substation Bus COTWD_1D 115kV Section 1D	P4	Stuck Breaker	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	No issues	Criteria Violations observed with 3-Phase Fault Simulations, working with PTO for SLG fault information.
P4-6-HBLTUVLS-6-Stuck Bus-tie Breaker 102 protecting Substation Bus COTWDPGE 115kV Section 1D	P4	Stuck Breaker	Potential WECC/NERC criteria violation	No issues	No issues	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Project:Garberville Area reinforcement
P5-5a/5-5c - Failure of non-redundant bus differential relay protecting Substation Bus HUMBOLDT 115 kV (ALL 115 kV elements clear remotely)	P5	Non-Redundant Battery/Relay	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	No issues	Potential WECC/NERC criteria violation	Potential WECC/NERC criteria violation	Install Redundant Relay
P6-2-HBLTUVLS-2-Fault on Line HUMBOLDT to BRDGVLLE 115kV ckt 1 with Loss of Tran HUMBOLDT 115/60kV bk 2	P6	N-1-1	No issues	No issues	No issues	No issues	No issues	Potential WECC/NERC criteria violation	Sensitivity only
P6-2-HBLTUVLS-2-Fault on Line HUMBOLDT to HMBOBAYPPB 115kV ckt 1 with Loss of Tran BRDGVLLE 115/60kV bk 1	P6	N-1-1	No issues	No issues	Potential WECC/NERC criteria violation	No issues	No issues	No issues	Continue to monitor

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)														Potential Mitigation Solutions
			2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2041 Summer Peak	2028 Winter Peak	2031 Winter Peak	2041 Winter Peak	2028 Spring Off-Peak	2036 Summer-Off Peak	2036 Winter Off-Peak	2041 Greater Bay area Summer Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	

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

Substation	Load Served (MW)															Potential Mitigation Solutions
	2026 Summer Peak	2028 Summer Peak	2031 Summer Peak	2036 Summer Peak	2041 Summer Peak	2028 Winter Peak	2031 Winter Peak	2041 Winter Peak	2028 Spring Off-Peak	2036 Summer-Off Peak	2036 Winter Off-Peak	2041 Greater Bay area Summer Peak	2028 SP Heavy Renewable & Min Gas Gen	2028 OP Sensitivity	2031 SP High CEC Forecast	

No single source substation with more than 100 MW