

Study Area: **PG&E Humboldt**

Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)									Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast		
Bridgeville - Garberville 60 kV Line (BRDGVILLE-FRUTLDJT)	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	86	93	134	52	56	71	74	86	83	51	94	Garberville Area Reinforcement	
	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	63	76	108	44	49	54	60	68	67	44	76	Garberville Area Reinforcement	
	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	57	71	101	42	47	52	57	65	64	42	71	Garberville Area Reinforcement	
	KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0] & FAIRHAVN 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	<100	Continue to monitor
Bridgeville-Cottonwood 115 kV Line	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110] & P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP	P6	N-1-1	83	83	70	140	150	123	107	105	106	141	82	Under review	
	HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP & HMBOBAYPPB 13.80KV GEN UNIT 7	P3	G-1/N-1	<100	<100	104	<100	<100	<100	<100	<100	<100	<100	<100	Continue to monitor	
Garberville-Kekawaka 60 kV Line	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP	P6	N-1-1	72	75	106	10	13	28	37	38	38	14	76	Continue to monitor	
	P1-2:A1:24:_BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	107	110	101	53	47	76	79	76	109	52	110	Garberville Area Reinforcement	
	BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT & FAIRHAVN 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	111	101	<100	<100	<100	<100	<100	<100	<100	113	Garberville Area Reinforcement	
GRBRVLE-KEKAWAKAJCT 60 kV	BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT & HMBOBAYPPB 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	112	101	<100	<100	<100	<100	<100	<100	<100	110	Garberville Area Reinforcement	
	P5-5C:A1:2:_BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	107	110	101	53	48	76	79	76	108	53	111	Install redundant battery supply	
Humboldt Bay - Rio Dell Jct 60 kV Line	P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	20	22	Diverge	88	88	44	29	25	21	89	24	Garberville Area Reinforcement	
	P1-3:A1:3:_BRDGVILLE 115/60KV TB 1	P1	N-1	88	94	103	86	74	68	68	75	83	91	94	Garberville Area Reinforcement	
	P2-3:A1:18:_BRDGVILLE 115KV - RING R3 & R2	P2	Bus/Breaker	81	87	111	94	86	72	70	77	86	98	87	Garberville Area Reinforcement	
	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	81	87	110	94	86	72	70	77	86	98	87	Garberville Area Reinforcement	
	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	81	87	110	94	86	72	70	77	86	98	87	Garberville Area Reinforcement	
	BRDGVILLE 115/60KV TB 1 & PAC.LUMB 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	98	129	<100	<100	<100	<100	<100	<100	<100	99	Garberville Area Reinforcement	
	BRDGVILLE 115/60KV TB 1 & PAC.LUMB 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	88	108	<100	<100	<100	<100	<100	<100	<100	89	Garberville Area Reinforcement	
Humboldt-Trinity 115 kV Line	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110] & P1-2:A1:1:_HUMBOLDT-BRIDGEVILLE 115KV [1810]	P6	N-1-1	81	87	110	94	86	86	85	93	86	96	87	Garberville Area Reinforcement	
	P1-2:A1:1:_HUMBOLDT-BRIDGEVILLE 115KV [1810] & P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP	P6	N-1-1	20	28	32	145	158	110	96	102	99	143	20	Under review	
Kekawaka-Laytonville 60 kV Line	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Diverge	143	133	18	24	40	56	57	59	21	144	Generation redispatch	
	P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	21	22	Diverge	88	88	43	28	25	20	89	25	Garberville Area Reinforcement	
Kekawaka-Laytonville 60 kV Line	P1-2:A1:24:_BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	108	110	101	54	49	89	89	86	109	54	109	Garberville Area Reinforcement	
	BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT & FAIRHAVN 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	111	101	<100	<100	<100	<100	<100	<100	<100	110	Garberville Area Reinforcement	
	BRIDGEVILLE-GARBerville 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT & HMBOBAYPPB 13.80KV GEN UNIT 4	P3	G-1/N-1	<100	109	102	<100	<100	<100	<100	<100	<100	<100	111	Garberville Area Reinforcement	

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Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)									Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast		
BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVLL FRUTLDJT & HMBOBAYPPB 13.80KV GEN UNIT 4		P3	G-1/N-1	<100	110	101	<100	<100	<100	<100	<100	<100	<100	111	Garberville Area Reinforcement	
	P5-5C:A1:2: BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	108	110	101	54	50	89	89	86	109	54	111	Install redundant battery supply	
Newburg-Rio Dell Tap 60 kV Line	P2-2:A1:1: HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	126	128	112	87	86	29	17	7	9	84	129	Garberville Area Reinforcement	
	P2-3:A1:1: HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Diverge	Diverge	121	92	95	29	16	10	7	89	Diverge	Garberville Area Reinforcement	
	P2-3:A1:18: BRDGVLL 115KV - RING R3 & R2	P2	Bus/Breaker	81	86	78	97	82	71	68	69	91	102	84	Sensitivity only	
	P2-3:A1:19: BRDGVLL 115KV - RING R1 & R2	P2	Bus/Breaker	81	86	78	97	82	71	68	69	91	102	84	Sensitivity only	
	P2-3:A1:2: HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	126	128	112	87	86	29	17	7	9	84	129	Garberville Area Reinforcement	
	P2-3:A1:20: BRDGVLL 115KV - RING R1 & R3	P2	Bus/Breaker	81	86	78	97	82	71	68	69	91	102	84	Sensitivity only	
	BRDGVLL 115/60KV TB 1 & PAC.LUMB 13.80KV GEN UNIT 1	P3	G-1/N-1	<100	100	103	<100	<100	<100	<100	<100	<100	<100	100	Garberville Area Reinforcement	
	P5-5:A1:1: HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	126	128	112	87	86	29	17	7	9	84	129	Install redundant relay	
	P5-5C:A1:1: HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Diverge	Diverge	121	92	95	29	16	10	7	89	Diverge	Install redundant battery supply	
	P1-2:A1:2: HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP & P1-2:A1:1: HUMBOLDT-BRIDGEVILLE 115KV [1810]	P6	N-1-1	17	19	54	164	179	123	102	105	109	160	19	Under review	
Rio Dell Jct - Bridgeville 60 kV Line (CARLOTTA-PCLUMBER)	P2-2:A1:1: HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	133	136	112	69	73	23	13	13	2	67	134	Garberville Area Reinforcement	
	P2-2:A1:1: HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	139	146	124	65	69	20	8	17	4	63	146	Garberville Area Reinforcement	
	P2-2:A1:1: HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	139	145	124	65	68	20	8	12	5	62	146	Garberville Area Reinforcement	
	P2-3:A1:1: HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Diverge	Diverge	117	74	82	23	12	16	2	71	Diverge	Garberville Area Reinforcement	
	P2-3:A1:1: HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Diverge	Diverge	128	70	77	20	7	12	7	67	Diverge	Garberville Area Reinforcement	
	P2-3:A1:1: HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Diverge	Diverge	128	70	76	20	7	12	7	67	Diverge	Garberville Area Reinforcement	
	P2-3:A1:2: HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	133	136	112	69	73	23	13	13	2	67	134	Garberville Area Reinforcement	
	P2-3:A1:2: HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	139	146	124	65	69	20	8	17	4	63	146	Garberville Area Reinforcement	
	P2-3:A1:2: HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	139	145	124	65	68	20	8	12	5	62	146	Garberville Area Reinforcement	
	P5-5:A1:1: HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	133	136	112	69	73	23	13	13	2	67	134	Install redundant relay	
	P5-5:A1:1: HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	139	146	124	65	69	20	8	17	4	63	146	Install redundant relay	
	P5-5:A1:1: HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	139	145	124	65	68	20	8	12	5	62	146	Install redundant relay	
	P5-5C:A1:1: HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Diverge	Diverge	117	74	82	23	12	16	2	71	Diverge	Install redundant battery supply	
	P5-5C:A1:1: HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Diverge	Diverge	128	70	77	20	7	12	7	67	Diverge	Install redundant battery supply	
	P5-5C:A1:1: HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Diverge	Diverge	128	70	76	20	7	12	7	67	Diverge	Install redundant battery supply	
	P1-2:A1:1: HUMBOLDT-BRIDGEVILLE 115KV [1810] & P1-2:A1:2: HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP	P6	N-1-1	26	23	89	134	151	106	86	83	88	131	34	Under review	

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Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)									Loading % (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast		
Rio Dell Tap 60 kV Line(SCOTIATP-RIODLLTP)	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	38	105	63	35	23	21	17	34	16	36	105	Under review	
Trinity-Maple Creek 60 kV Line	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	99	102	98	29	36	2	8	27	21	25	103	Under review	
	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	99	103	98	29	36	3	8	27	21	26	102	Under review	
	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	99	102	98	29	36	2	8	27	21	25	103	Under review	
	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	99	103	98	29	36	3	8	27	21	26	102	Under review	
	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	99	102	98	29	36	2	8	27	21	25	103	Install redundant relay	
	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	99	103	98	29	36	3	8	27	21	26	102	Install redundant relay	
	P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	28	28	Diverge	71	89	37	20	18	16	64	31	Continue to monitor	

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
HUMBOLDT 115 kV	Base Case	P0	Normal	High	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	1.07	0.97	0.97	System adjustments or voltage support if needed
LOW GAP1 115 kV	Base Case	P0	Normal	High	1.01	1.01	0.99	1.00	1.01	1.01	1.00	1.00	1.07	1.00	1.01	System adjustments or voltage support if needed
BRDGVLE 115 kV	Base Case	P0	Normal	High	1.00	1.00	0.98	1.00	1.00	1.00	0.99	0.99	1.07	1.00	1.00	System adjustments or voltage support if needed
HMBOBAYPPB 115 kV	Base Case	P0	Normal	High	0.99	0.98	0.98	0.99	0.99	0.99	0.99	0.99	1.07	0.99	0.98	System adjustments or voltage support if needed
LP_FLKBD 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
JANS CRK 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
ARCTAJT1 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
ARC_JT2X 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
ARCTA_J2 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
HUMBOLDT 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	System adjustments or voltage support if needed
HARRIS 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
HARRISST 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
EUREKA 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.02	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
EUREKA A 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.02	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	System adjustments or voltage support if needed
HMBLT JT 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.03	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.03	System adjustments or voltage support if needed
HMBLT BY 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.02	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	System adjustments or voltage support if needed
HMBOBAYPPC 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.02	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	System adjustments or voltage support if needed
HMBOBAYPPA 60 kV	Base Case	P0	Normal	High	1.03	1.03	1.02	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	System adjustments or voltage support if needed
SCOTIATP 60 kV	Base Case	P0	Normal	High	1.03	1.03	0.99	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	System adjustments or voltage support if needed
RIO DELL 60 kV	Base Case	P0	Normal	High	1.03	1.03	0.99	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	System adjustments or voltage support if needed
SWNS FLT 60 kV	Base Case	P0	Normal	High	1.00	1.00	0.97	1.00	1.00	0.99	0.99	0.98	1.05	1.00	1.00	System adjustments or voltage support if needed
SCTIATP2 60 kV	Base Case	P0	Normal	High	1.03	1.03	0.99	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	System adjustments or voltage support if needed
BRDGVLE 60 kV	Base Case	P0	Normal	High	0.99	0.99	0.96	0.99	0.99	0.98	0.98	0.97	1.05	0.99	0.99	System adjustments or voltage support if needed
FRUITLND 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.89	0.98	1.01	0.94	0.94	0.89	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	Base Case	P0	Normal	Low	0.96	0.96	0.88	0.98	1.02	0.93	0.92	0.89	1.02	0.97	0.96	Continue to monitor
GRBRVLE 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.88	0.99	1.03	0.92	0.90	0.88	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.89	0.99	1.03	0.93	0.92	0.90	1.02	0.98	0.97	Continue to monitor
FRUITLND 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.89	0.98	1.01	0.94	0.94	0.89	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	Base Case	P0	Normal	Low	0.96	0.96	0.88	0.98	1.02	0.93	0.92	0.89	1.02	0.97	0.96	Continue to monitor
GRBRVLE 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.88	0.99	1.03	0.92	0.90	0.88	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	Base Case	P0	Normal	Low	0.97	0.97	0.89	0.99	1.03	0.93	0.92	0.90	1.02	0.98	0.97	Continue to monitor
FRUITLND 60 kV	P1-1:A1:2: PAC.LUMB 13.80KV GEN UNIT 1	P1	N-1	Low	0.97	0.97	0.88	0.98	1.01	0.94	0.94	0.89	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	P1-1:A1:2: PAC.LUMB 13.80KV GEN UNIT 1	P1	N-1	Low	0.96	0.96	0.88	0.98	1.02	0.93	0.92	0.89	1.02	0.97	0.96	Continue to monitor
GRBRVLE 60 kV	P1-1:A1:2: PAC.LUMB 13.80KV GEN UNIT 1	P1	N-1	Low	0.97	0.97	0.87	0.99	1.03	0.92	0.90	0.88	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-1:A1:2: PAC.LUMB 13.80KV GEN UNIT 1	P1	N-1	Low	0.97	0.97	0.89	0.99	1.03	0.93	0.92	0.90	1.02	0.98	0.97	Continue to monitor
FRUITLND 60 kV	P1-1:A1:3: PAC.LUMB 13.80KV GEN UNIT 2	P1	N-1	Low	0.97	0.97	0.88	0.98	1.01	0.94	0.94	0.89	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	P1-1:A1:3: PAC.LUMB 13.80KV GEN UNIT 2	P1	N-1	Low	0.96	0.96	0.88	0.98	1.02	0.93	0.92	0.89	1.02	0.97	0.96	Continue to monitor
GRBRVLE 60 kV	P1-1:A1:3: PAC.LUMB 13.80KV GEN UNIT 2	P1	N-1	Low	0.97	0.97	0.87	0.99	1.03	0.92	0.90	0.88	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-1:A1:3: PAC.LUMB 13.80KV GEN UNIT 2	P1	N-1	Low	0.97	0.97	0.89	0.99	1.03	0.93	0.92	0.90	1.02	0.98	0.97	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
FRUITLND 60 kV	P1-1:A1:4:_HMBOBAYPPB 13.80KV GEN UNIT 5	P1	N-1	Low	0.97	0.97	0.88	0.99	1.01	0.94	0.94	0.89	1.03	0.98	0.96	Continue to monitor
KEKAWAKA 60 kV	P1-1:A1:4:_HMBOBAYPPB 13.80KV GEN UNIT 5	P1	N-1	Low	0.97	0.97	0.89	1.00	1.03	0.93	0.92	0.90	1.02	0.99	0.97	Continue to monitor
FRUITLND 60 kV	P1-1:A1:5:_HMBOBAYPPB 13.80KV GEN UNIT 6	P1	N-1	Low	0.97	0.97	0.88	0.99	1.01	0.94	0.94	0.89	1.03	0.98	0.96	Continue to monitor
FRT SWRD 60 kV	P1-1:A1:5:_HMBOBAYPPB 13.80KV GEN UNIT 6	P1	N-1	Low	0.96	0.96	0.88	0.99	1.02	0.93	0.92	0.89	1.02	0.98	0.96	Continue to monitor
GRBRVLE 60 kV	P1-1:A1:5:_HMBOBAYPPB 13.80KV GEN UNIT 6	P1	N-1	Low	0.97	0.97	0.87	1.00	1.03	0.92	0.90	0.88	1.03	0.99	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-1:A1:5:_HMBOBAYPPB 13.80KV GEN UNIT 6	P1	N-1	Low	0.97	0.97	0.89	1.00	1.03	0.93	0.92	0.90	1.02	0.99	0.97	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:1:_HUMBOLDT-BRIDGEVILLE 115KV [1810]	P1	N-1	Low	1.00	1.00	0.90	1.01	1.02	0.95	0.94	0.90	1.01	1.00	1.00	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:1:_HUMBOLDT-BRIDGEVILLE 115KV [1810]	P1	N-1	Low	1.00	1.00	0.89	1.01	1.03	0.94	0.93	0.89	1.01	1.00	1.00	Continue to monitor
WILLWCRK 60 kV	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60KV [7130] MOAS OPENED ON HUMBOLDT_MPLE CRK	P1	N-1	Low	0.88	1.03	1.03	0.93	0.98	0.98	0.99	1.03	0.95	0.97	1.03	Project: Willow Creek voltage support
HOOPA 60 kV	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60KV [7130] MOAS OPENED ON HUMBOLDT_MPLE CRK	P1	N-1	Low	0.87	1.03	1.02	0.92	0.98	0.98	0.99	1.03	0.95	0.96	1.03	Project: Willow Creek voltage support
NEWBURG 60 kV	P1-2:A1:16:_HUMBOLDT BAY-RIO DELL JCT 60KV [7100] MOAS OPENED ON EEL RIVR_NEWBURG	P1	N-1	Low	1.01	1.00	0.89	1.00	1.01	1.00	0.99	0.95	1.05	1.00	1.00	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY_JESSTAP	P1	N-1	Low	0.97	0.97	0.89	0.98	1.03	0.92	0.92	0.90	1.02	0.96	0.97	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:20:_60KV [9999] (2)	P1	N-1	Low	0.96	0.96	0.88	1.00	1.02	0.94	0.93	0.90	1.02	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:20:_60KV [9999] (2)	P1	N-1	Low	0.97	0.97	0.88	1.01	1.03	0.93	0.92	0.89	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P1-2:A1:21:_HUMBOLDT BAY-RIO DELL JCT 60KV [7100] MOAS OPENED ON NEWBURG_RIODLLTP	P1	N-1	Low	0.97	0.97	0.89	0.99	1.01	0.95	0.94	0.90	1.03	0.98	0.97	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:22:_RIO DELL JCT-BRIDGEVILLE 60KV [7850] MOAS OPENED ON CARLOTTA_SWNS FLT	P1	N-1	Low	0.96	0.96	0.87	0.98	1.03	0.91	0.90	0.87	1.03	0.98	0.96	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:22:_RIO DELL JCT-BRIDGEVILLE 60KV [7850] MOAS OPENED ON CARLOTTA_SWNS FLT	P1	N-1	Low	0.96	0.96	0.88	0.99	1.03	0.93	0.91	0.89	1.02	0.98	0.96	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:23:_RIO DELL JCT-BRIDGEVILLE 60KV [7850] MOAS OPENED ON CARLOTTA_SWNS FLT (2)	P1	N-1	Low	0.96	0.96	0.87	0.99	1.03	0.92	0.90	0.87	1.03	0.98	0.96	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:23:_RIO DELL JCT-BRIDGEVILLE 60KV [7850] MOAS OPENED ON CARLOTTA_SWNS FLT (2)	P1	N-1	Low	0.96	0.96	0.88	0.99	1.03	0.93	0.92	0.89	1.02	0.98	0.96	Continue to monitor
FRUITLND 60 kV	P1-2:A1:24:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVLE_FRUTLDTJ	P1	N-1	Low	0.50	0.49	0.41	1.03	1.03	0.49	0.47	0.41	0.53	1.03	0.48	Garberville Area Reinforcement
FRT SWRD 60 kV	P1-2:A1:24:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVLE_FRUTLDTJ	P1	N-1	Low	0.50	0.50	0.43	1.03	1.03	0.48	0.46	0.43	0.53	1.03	0.48	Garberville Area Reinforcement
GRBRVLE 60 kV	P1-2:A1:24:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVLE_FRUTLDTJ	P1	N-1	Low	0.51	0.51	0.45	1.03	1.03	0.48	0.47	0.45	0.54	1.03	0.49	Garberville Area Reinforcement
KEKAWAKA 60 kV	P1-2:A1:24:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVLE_FRUTLDTJ	P1	N-1	Low	0.55	0.54	0.50	1.03	1.03	0.53	0.52	0.50	0.58	1.03	0.54	Garberville Area Reinforcement
GRBRVLE 60 kV	P1-2:A1:25:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON FTSWRDJT_GRBRVLE	P1	N-1	Low	0.78	0.74	0.54	1.03	1.03	0.54	0.54	0.54	0.90	1.03	0.73	Garberville Area Reinforcement
KEKAWAKA 60 kV	P1-2:A1:25:_BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON FTSWRDJT_GRBRVLE	P1	N-1	Low	0.80	0.76	0.58	1.03	1.03	0.59	0.59	0.58	0.90	1.03	0.74	Garberville Area Reinforcement
FRUITLND 60 kV	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P1	N-1	Low	0.97	0.96	0.84	0.96	1.00	0.92	0.92	0.87	1.03	0.95	0.96	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P1	N-1	Low	0.96	0.96	0.83	0.96	1.00	0.91	0.90	0.87	1.02	0.94	0.96	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P1	N-1	Low	0.97	0.97	0.83	0.96	1.02	0.90	0.89	0.86	1.03	0.95	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P1	N-1	Low	0.97	0.97	0.84	0.96	1.02	0.91	0.91	0.88	1.02	0.95	0.97	Continue to monitor
HUMBOLDT 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.95	0.96	0.83	0.97	0.97	0.96	0.96	0.96	1.07	0.97	0.96	Continue to monitor
LOW GAP1 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.98	1.00	0.89	1.00	1.01	1.01	1.00	1.00	1.07	1.00	1.00	Continue to monitor
BRDGVLE 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.97	0.99	0.86	1.00	1.00	1.00	0.99	0.99	1.07	1.00	0.99	Continue to monitor
HUMBOLDT 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HMBOBAYPPC 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
HOOPA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.97	1.03	0.89	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.02	1.01	1.05	1.02	1.01	Continue to monitor
NEWBURG 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.01	1.01	1.05	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
CARLOTTA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
RIO DELL 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.98	0.99	0.85	1.00	1.00	0.99	0.99	0.98	1.05	1.00	0.99	Continue to monitor
SCTIATP2 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.97	0.99	0.85	0.99	0.99	0.98	0.98	0.97	1.05	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.96	0.97	0.78	1.00	1.01	0.96	0.94	0.90	1.04	0.99	0.96	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.96	0.96	0.78	1.00	1.02	0.94	0.93	0.90	1.03	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.97	0.97	0.78	1.01	1.03	0.93	0.91	0.89	1.03	1.00	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	Low	0.97	0.97	0.80	1.01	1.03	0.94	0.93	0.90	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	Low	0.95	0.94	0.69	1.00	1.01	0.88	0.85	0.77	1.03	1.00	0.94	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	Low	0.94	0.93	0.65	1.01	1.02	0.84	0.81	0.75	1.03	1.00	0.93	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:5:_KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	Low	0.94	0.93	0.59	1.02	1.03	0.81	0.77	0.71	1.03	1.01	0.93	Continue to monitor
FRUITLND 60 kV	P1-3:A1:1:_HUMBOLDT 115/60KV TB 1	P1	N-1	Low	0.97	0.97	0.89	0.99	1.01	0.95	0.94	0.90	1.03	0.98	0.96	Continue to monitor
FRUITLND 60 kV	P1-3:A1:2:_HUMBOLDT 115/60KV TB 2	P1	N-1	Low	0.97	0.97	0.89	0.99	1.01	0.95	0.94	0.90	1.03	0.98	0.97	Continue to monitor
SWNS FLT 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	1.00	0.99	0.86	1.02	1.02	0.97	0.96	0.90	1.02	1.01	0.99	Continue to monitor
BRDGVLE 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	0.99	0.99	0.84	1.02	1.02	0.96	0.95	0.88	1.01	1.01	0.99	Continue to monitor
FRUITLND 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	0.98	0.97	0.78	1.02	1.02	0.94	0.92	0.81	1.00	1.00	0.97	Continue to monitor
FRT SWRD 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	0.98	0.97	0.77	1.03	1.03	0.93	0.91	0.81	1.00	1.01	0.97	Continue to monitor
GRBRVLE 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	0.98	0.97	0.77	1.03	1.03	0.92	0.90	0.81	1.01	1.01	0.97	Continue to monitor
KEKAWAKA 60 kV	P1-3:A1:3:_BRDGVLE 115/60KV TB 1	P1	N-1	Low	0.98	0.97	0.79	1.03	1.03	0.93	0.91	0.83	1.01	1.01	0.97	Continue to monitor
HUMBOLDT 115 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.95	0.96	0.83	0.97	0.97	0.96	0.96	0.96	1.07	0.97	0.96	Continue to monitor
LOW GAP1 115 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.98	1.00	0.89	1.00	1.01	1.01	1.00	1.00	1.07	1.00	1.00	Continue to monitor
BRDGVLE 115 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.97	0.99	0.86	1.00	1.00	1.00	0.99	0.99	1.07	1.00	0.99	Continue to monitor
HUMBOLDT 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HMBOBAYPPC 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.97	1.03	0.89	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.02	1.01	1.05	1.02	1.01	Continue to monitor
NEWBURG 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.01	1.01	1.05	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
CARLOTTA 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
RIO DELL 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.98	0.99	0.85	1.00	1.00	0.99	0.99	0.98	1.05	1.00	0.99	Continue to monitor
SCTIATP2 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.97	0.99	0.85	0.99	0.99	0.98	0.98	0.97	1.05	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.96	0.97	0.78	1.00	1.01	0.96	0.94	0.90	1.04	0.99	0.96	Continue to monitor
FRT SWRD 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.96	0.96	0.78	1.00	1.02	0.94	0.93	0.90	1.03	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P1-3:A1:4:_HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.97	0.97	0.78	1.01	1.03	0.93	0.91	0.89	1.03	1.00	0.97	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
KEKAWAKA 60 kV	P1-3-A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	Low	0.97	0.97	0.80	1.01	1.03	0.94	0.93	0.90	1.03	1.00	0.97	Continue to monitor
FRT SWRD 60 kV	P1-3-A1:7:_ HMBOBAYPPA 60/13.8KV TB 1	P1	N-1	Low	0.96	0.96	0.88	1.00	1.02	0.94	0.93	0.90	1.02	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P1-3-A1:7:_ HMBOBAYPPA 60/13.8KV TB 1	P1	N-1	Low	0.97	0.97	0.88	1.01	1.03	0.93	0.92	0.89	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P1-4-A1:4:_ HUMBOLDT 60.00KV ID=7H & HUMBOLDT 60.00KV ID=5H & HUMBOLDT 60.00KV ID=1H & HUMBOLDT 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.99	0.99	0.90	1.00	1.02	0.98	0.97	0.91	1.02	1.00	0.99	Continue to monitor
FRT SWRD 60 kV	P1-4-A1:4:_ HUMBOLDT 60.00KV ID=7H & HUMBOLDT 60.00KV ID=5H & HUMBOLDT 60.00KV ID=1H & HUMBOLDT 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.99	0.99	0.89	1.00	1.03	0.96	0.95	0.90	1.01	0.99	0.98	Continue to monitor
GRBRVLE 60 kV	P1-4-A1:4:_ HUMBOLDT 60.00KV ID=7H & HUMBOLDT 60.00KV ID=5H & HUMBOLDT 60.00KV ID=1H & HUMBOLDT 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.99	0.99	0.89	1.01	1.03	0.95	0.93	0.90	1.02	1.00	0.99	Continue to monitor
FRUITLND 60 kV	P1-4-A1:5:_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.91	0.91	0.83	0.92	0.96	0.88	0.87	0.83	0.97	0.91	0.91	Continue to monitor
FRT SWRD 60 kV	P1-4-A1:5:_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.89	0.89	0.81	0.91	0.96	0.85	0.83	0.82	0.95	0.90	0.89	Garberville Area Reinforcement
GRBRVLE 60 kV	P1-4-A1:5:_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.87	0.88	0.79	0.89	0.95	0.81	0.80	0.79	0.93	0.88	0.87	Garberville Area Reinforcement
KEKAWAKA 60 kV	P1-4-A1:5:_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	Low	0.89	0.89	0.81	0.91	0.96	0.84	0.83	0.82	0.94	0.90	0.89	Garberville Area Reinforcement
FRUITLND 60 kV	P2-1-A1:2:_ BRIDGEVILLE-COTTONWOOD 115KV [1110] (FRSTGLEN-LOW GAP1)	P2	Bus/Breaker	Low	0.97	0.97	0.84	0.96	1.00	0.93	0.92	0.87	1.03	0.95	0.96	Continue to monitor
FRT SWRD 60 kV	P2-1-A1:2:_ BRIDGEVILLE-COTTONWOOD 115KV [1110] (FRSTGLEN-LOW GAP1)	P2	Bus/Breaker	Low	0.96	0.96	0.83	0.96	1.01	0.91	0.90	0.87	1.03	0.95	0.96	Continue to monitor
GRBRVLE 60 kV	P2-1-A1:2:_ BRIDGEVILLE-COTTONWOOD 115KV [1110] (FRSTGLEN-LOW GAP1)	P2	Bus/Breaker	Low	0.97	0.97	0.83	0.97	1.02	0.90	0.89	0.86	1.03	0.95	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-1-A1:2:_ BRIDGEVILLE-COTTONWOOD 115KV [1110] (FRSTGLEN-LOW GAP1)	P2	Bus/Breaker	Low	0.97	0.97	0.84	0.97	1.02	0.91	0.91	0.88	1.02	0.96	0.97	Continue to monitor
HUMBOLDT 115 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.95	0.96	0.83	0.97	0.97	0.96	0.96	0.96	1.07	0.97	0.96	Continue to monitor
LOW GAP1 115 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.98	1.00	0.89	1.00	1.01	1.01	1.00	1.00	1.07	1.00	1.00	Continue to monitor
BRDGVLE 115 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.97	0.99	0.86	1.00	1.00	1.00	0.99	0.99	1.07	1.00	0.99	Continue to monitor
HUMBOLDT 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HMBOBAYPPC 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.97	1.03	0.89	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.01	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.02	1.01	1.05	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.01	1.01	1.05	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
CARLOTTA 60 kV	P2-1-A1:3:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
RIO DELL 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.98	0.99	0.85	1.00	1.00	0.99	0.99	0.98	1.05	1.00	0.99	Continue to monitor
SCTIATP2 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.97	0.99	0.85	0.99	0.99	0.98	0.98	0.97	1.05	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.96	0.97	0.78	1.00	1.01	0.96	0.94	0.90	1.04	0.99	0.96	Continue to monitor
FRT SWRD 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.96	0.96	0.78	1.00	1.02	0.94	0.93	0.90	1.03	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.97	0.97	0.78	1.01	1.03	0.93	0.91	0.89	1.03	1.00	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-1:A1:3:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] (HMBOBAYPPB-HUMBOLDT)	P2	Bus/Breaker	Low	0.97	0.97	0.80	1.01	1.03	0.94	0.93	0.90	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P2-1:A1:50:_PACIFIC LUMBER (SCOTIA) TAP 60KV [7852] (SCTIATP2-SCOTIATP)	P2	Bus/Breaker	Low	0.97	0.97	0.88	0.98	1.01	0.94	0.93	0.88	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	P2-1:A1:50:_PACIFIC LUMBER (SCOTIA) TAP 60KV [7852] (SCTIATP2-SCOTIATP)	P2	Bus/Breaker	Low	0.96	0.96	0.87	0.98	1.02	0.93	0.91	0.88	1.02	0.97	0.96	Continue to monitor
GRBRVLE 60 kV	P2-1:A1:50:_PACIFIC LUMBER (SCOTIA) TAP 60KV [7852] (SCTIATP2-SCOTIATP)	P2	Bus/Breaker	Low	0.97	0.97	0.87	0.99	1.03	0.92	0.90	0.87	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-1:A1:50:_PACIFIC LUMBER (SCOTIA) TAP 60KV [7852] (SCTIATP2-SCOTIATP)	P2	Bus/Breaker	Low	0.97	0.97	0.88	0.99	1.03	0.93	0.92	0.89	1.02	0.98	0.97	Continue to monitor
LOW GAP1 115 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.86	0.87	0.79	1.04	1.05	1.05	1.04	1.02	1.07	1.04	0.86	Garberville Area Reinforcement
BRDGVLE 115 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.83	0.83	0.73	1.04	1.04	1.04	1.03	1.02	1.07	1.04	0.82	Garberville Area Reinforcement
HUMBOLDT 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
HARRIS 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
EUREKA 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
EUREKA A 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
HMBLT BY 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
RDGE CBN 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.61	0.62	0.55	1.02	1.02	1.04	1.04	1.04	1.06	1.02	0.61	Garberville Area Reinforcement
MPLE CRK 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.56	0.44	1.02	1.03	1.03	1.03	1.03	1.06	1.02	0.54	Garberville Area Reinforcement
RUSS RCH 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.54	0.55	0.43	1.02	1.02	1.03	1.03	1.03	1.06	1.02	0.53	Garberville Area Reinforcement
WILLWCRK 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.51	0.55	0.42	1.01	1.02	1.02	1.02	1.03	1.04	1.01	0.52	Garberville Area Reinforcement
HMBOBAYPPC 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
HOOPA 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.50	0.53	0.41	1.00	1.01	1.01	1.01	1.03	1.04	1.00	0.51	Garberville Area Reinforcement
HMBOBAYPPA 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
EEL RIVR 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.58	0.58	0.43	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.56	Garberville Area Reinforcement
SCOTIATP 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
NEWBURG 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.61	0.60	0.45	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.58	Garberville Area Reinforcement
PCLUMBER 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Garberville Area Reinforcement
CARLOTTA 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Garberville Area Reinforcement
RIO DELL 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
SWNS FLT 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.77	0.76	0.64	1.02	1.02	1.03	1.02	1.00	1.05	1.02	0.75	Garberville Area Reinforcement
SCTIATP2 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
BRDGVLE 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.81	0.81	0.69	1.02	1.02	1.03	1.02	0.99	1.05	1.02	0.80	Garberville Area Reinforcement
FRUITLND 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.81	0.81	0.60	1.02	1.02	0.99	0.98	0.92	1.03	1.01	0.80	Garberville Area Reinforcement
FRT SWRD 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.82	0.81	0.60	1.02	1.03	0.98	0.96	0.92	1.03	1.01	0.80	Garberville Area Reinforcement
GRBRVLE 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.83	0.82	0.60	1.03	1.03	0.96	0.95	0.91	1.03	1.02	0.82	Garberville Area Reinforcement
KEKAWAKA 60 kV	P2-2:A1:1:_HUMBOLDT 115KV SECTION MA	P2	Bus/Breaker	Low	0.85	0.84	0.64	1.02	1.03	0.97	0.95	0.92	1.03	1.02	0.83	Garberville Area Reinforcement
HUMBOLDT 115 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.95	0.96	0.83	0.97	0.97	0.96	0.96	0.96	1.07	0.97	0.96	Continue to monitor
LOW GAP1 115 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.98	1.00	0.89	1.00	1.01	1.01	1.00	1.00	1.07	1.00	1.00	Continue to monitor
BRDGVLE 115 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.98	0.99	0.86	1.00	1.00	1.00	0.99	0.99	1.07	1.00	0.99	Continue to monitor
HMBOBAYPPB 115 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.95	0.96	0.83	0.97	0.97	0.96	0.96	0.96	1.07	0.97	0.96	Continue to monitor
HUMBOLDT 60 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.03	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.89	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P2-2:A1:11:_HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
HMBOBAYPPC 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.97	1.03	0.90	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.02	1.01	1.05	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.00	1.01	0.85	1.02	1.03	1.02	1.01	1.01	1.05	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
CARLOTTA 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.01	1.02	0.85	1.02	1.02	1.01	1.01	1.00	1.05	1.02	1.02	Continue to monitor
RIO DELL 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.98	0.99	0.85	1.00	1.00	0.99	0.99	0.98	1.05	1.00	0.99	Continue to monitor
SCTIATP2 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.03	1.03	1.02	1.01	1.01	1.05	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.98	0.99	0.85	0.99	0.99	0.98	0.98	0.97	1.05	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.96	0.97	0.78	1.00	1.01	0.96	0.94	0.90	1.04	0.99	0.96	Continue to monitor
FRT SWRD 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.96	0.96	0.78	1.00	1.02	0.94	0.93	0.90	1.03	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.97	0.78	1.01	1.03	0.93	0.91	0.89	1.03	1.00	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-2:A1:11_ HMBOBAYPPB 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.97	0.80	1.01	1.03	0.94	0.93	0.90	1.03	1.00	0.97	Continue to monitor
FRT SWRD 60 kV	P2-2:A1:12_ HMBOBAYPPA 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.96	0.96	0.88	1.00	1.02	0.94	0.93	0.90	1.02	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P2-2:A1:12_ HMBOBAYPPA 13.8KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.97	0.88	1.01	1.03	0.93	0.92	0.89	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P2-2:A1:2_ LOW GAP1 115KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.96	0.84	0.96	1.00	0.92	0.92	0.87	1.03	0.95	0.96	Continue to monitor
FRT SWRD 60 kV	P2-2:A1:2_ LOW GAP1 115KV SECTION 1D	P2	Bus/Breaker	Low	0.96	0.96	0.84	0.96	1.00	0.91	0.90	0.87	1.02	0.94	0.96	Continue to monitor
GRBRVLE 60 kV	P2-2:A1:2_ LOW GAP1 115KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.97	0.83	0.96	1.02	0.90	0.89	0.86	1.03	0.95	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-2:A1:2_ LOW GAP1 115KV SECTION 1D	P2	Bus/Breaker	Low	0.97	0.97	0.84	0.96	1.02	0.91	0.91	0.88	1.02	0.95	0.97	Continue to monitor
LOW GAP1 115 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.78	1.04	1.04	1.05	1.04	1.02	1.07	1.04	Diverge	Garberville Area Reinforcement
BRDGVLE 115 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.72	1.04	1.04	1.04	1.03	1.02	1.07	1.04	Diverge	Garberville Area Reinforcement
HUMBOLDT 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.03	1.03	1.03	1.03	1.03	1.08	1.03	Diverge	Garberville Area Reinforcement
HARRIS 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.03	1.03	1.03	1.03	1.03	1.08	1.03	Diverge	Garberville Area Reinforcement
EUREKA 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.03	1.04	1.03	1.03	1.03	1.08	1.03	Diverge	Garberville Area Reinforcement
EUREKA A 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.35	1.03	1.04	1.03	1.03	1.03	1.08	1.03	Diverge	Garberville Area Reinforcement
HMBLT BY 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Garberville Area Reinforcement
RDGE CBN 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.45	1.02	1.02	1.03	1.03	1.03	1.06	1.03	Diverge	Garberville Area Reinforcement
MPLE CRK 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.38	1.02	1.03	1.03	1.03	1.03	1.06	1.02	Diverge	Garberville Area Reinforcement
RUSS RCH 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.38	1.02	1.02	1.02	1.03	1.03	1.06	1.02	Diverge	Garberville Area Reinforcement
WILLWCRK 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.01	1.02	1.01	1.02	1.03	1.04	1.01	Diverge	Garberville Area Reinforcement
HMBOBAYPPC 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Garberville Area Reinforcement
HOOPA 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.35	1.00	1.01	1.01	1.01	1.03	1.03	1.00	Diverge	Garberville Area Reinforcement
HMBOBAYPPA 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Garberville Area Reinforcement
EEL RIVR 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.40	1.02	1.03	1.03	1.02	1.01	1.06	1.02	Diverge	Garberville Area Reinforcement
SCOTIATP 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Garberville Area Reinforcement
NEWBURG 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.43	1.02	1.03	1.03	1.02	1.01	1.06	1.02	Diverge	Garberville Area Reinforcement
PCLUMBER 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.48	1.02	1.02	1.03	1.02	1.01	1.06	1.02	Diverge	Garberville Area Reinforcement
CARLOTTA 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.48	1.02	1.02	1.03	1.02	1.01	1.06	1.02	Diverge	Garberville Area Reinforcement
RIO DELL 60 kV	P2-3:A1:1_ HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Garberville Area Reinforcement

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
SWNS FLT 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.62	1.02	1.01	1.03	1.02	1.00	1.05	1.02	Diverge	Garberville Area Reinforcement
SCTIATP2 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Garberville Area Reinforcement
BRDGVLE 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.68	1.02	1.01	1.03	1.02	0.99	1.05	1.02	Diverge	Garberville Area Reinforcement
FRUITLND 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.60	1.01	1.02	0.99	0.98	0.92	1.03	1.01	Diverge	Garberville Area Reinforcement
FRT SWRD 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.59	1.01	1.03	0.98	0.96	0.92	1.03	1.01	Diverge	Garberville Area Reinforcement
GRBRVLE 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.59	1.02	1.03	0.96	0.95	0.91	1.03	1.02	Diverge	Garberville Area Reinforcement
KEKAWAKA 60 kV	P2-3:A1:1:_HUMBOLDT - MA 115KV & HUMBOLDT-TRINITY LINE	P2	Bus/Breaker	Low	Diverge	Diverge	0.64	1.02	1.03	0.97	0.95	0.92	1.03	1.01	Diverge	Garberville Area Reinforcement
HUMBOLDT 115 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.96	0.96	0.79	0.97	0.97	0.97	0.97	0.97	1.07	0.97	0.96	Continue to monitor
HMBOBAYPPB 115 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.81	0.99	0.99	0.99	0.99	0.99	1.07	0.99	0.98	Continue to monitor
HUMBOLDT 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.84	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.84	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.82	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.82	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.81	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
RDGE CBN 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.02	1.03	0.87	1.01	1.01	1.03	1.03	1.03	1.05	1.01	1.03	Continue to monitor
MPLE CRK 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.02	1.03	0.85	1.02	1.02	1.03	1.03	1.03	1.04	1.02	1.03	Continue to monitor
RUSS RCH 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.01	1.03	0.85	1.02	1.02	1.02	1.03	1.03	1.04	1.02	1.03	Continue to monitor
WILLWCRK 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.99	1.03	0.85	1.00	1.01	1.01	1.02	1.03	1.02	1.01	1.03	Continue to monitor
HMBOBAYPPC 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.81	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.99	1.03	0.84	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.81	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.01	1.01	0.75	1.02	1.03	1.01	1.01	0.99	1.03	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.73	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.01	1.01	0.73	1.02	1.03	1.01	1.00	0.98	1.03	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.02	1.02	0.72	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
CARLOTTA 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.02	1.02	0.72	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
RIO DELL 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.73	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.00	1.00	0.65	1.00	1.01	0.96	0.95	0.89	1.01	1.00	1.00	Continue to monitor
SCTIATP2 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.73	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	1.00	0.99	0.63	1.00	1.01	0.95	0.94	0.87	1.01	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.56	0.99	1.02	0.93	0.91	0.81	1.00	0.98	0.98	Continue to monitor
FRT SWRD 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.56	1.00	1.02	0.91	0.89	0.81	1.00	0.98	0.97	Continue to monitor
GRBRVLE 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.56	1.01	1.03	0.90	0.88	0.80	1.00	0.99	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-3:A1:18_ BRDGVLE 115KV - RING R3 & R2	P2	Bus/Breaker	Low	0.98	0.97	0.60	1.01	1.03	0.92	0.90	0.83	1.00	0.99	0.97	Continue to monitor
HUMBOLDT 115 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.96	0.96	0.80	0.97	0.97	0.97	0.97	0.97	1.07	0.97	0.96	Continue to monitor
BRDGVLE 115 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.97	0.97	0.80	0.97	0.97	0.97	0.97	0.97	1.08	0.97	0.97	Continue to monitor
HMBOBAYPPB 115 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.99	0.98	0.82	0.99	0.99	0.99	0.99	0.99	1.07	0.99	0.98	Continue to monitor
HUMBOLDT 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.86	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.85	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.84	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.84	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.83	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
RDGE CBN 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.02	1.03	0.88	1.01	1.01	1.03	1.03	1.03	1.05	1.01	1.03	Continue to monitor
MPLE CRK 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.02	1.03	0.86	1.02	1.02	1.03	1.03	1.03	1.04	1.02	1.03	Continue to monitor
RUSS RCH 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.01	1.03	0.86	1.02	1.02	1.02	1.03	1.03	1.04	1.02	1.03	Continue to monitor
WILLWCRK 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.99	1.03	0.86	1.00	1.01	1.01	1.02	1.03	1.02	1.01	1.03	Continue to monitor
HMBOBAYPPC 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.83	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.99	1.03	0.85	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.83	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.01	1.01	0.76	1.02	1.03	1.01	1.01	0.99	1.03	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.74	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P2-3:A1:19_ BRDGVLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.01	1.01	0.75	1.02	1.03	1.01	1.00	0.98	1.03	1.02	1.01	Continue to monitor

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
PCLUMBER 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.02	1.02	0.73	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
CARLOTTA 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.02	1.02	0.73	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
RIO DELL 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.74	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.00	1.00	0.66	1.00	1.01	0.96	0.95	0.89	1.01	1.00	1.00	Continue to monitor
SCTIATP2 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.03	1.03	0.74	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
BRDGVILLE 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	1.00	0.99	0.64	1.00	1.01	0.95	0.95	0.87	1.01	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.57	0.99	1.02	0.93	0.91	0.81	0.99	0.98	0.98	Continue to monitor
FRT SWRD 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.57	1.00	1.02	0.91	0.90	0.81	1.00	0.98	0.97	Continue to monitor
GRBRVILLE 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.98	0.98	0.56	1.01	1.03	0.90	0.89	0.80	1.00	0.99	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-3:A1:19:_BRDGVILLE 115KV - RING R1 & R2	P2	Bus/Breaker	Low	0.98	0.97	0.60	1.01	1.03	0.92	0.90	0.83	1.00	0.99	0.97	Continue to monitor
LOW GAP1 115 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.86	0.87	0.79	1.04	1.05	1.05	1.04	1.02	1.07	1.04	0.86	Garberville Area Reinforcement
BRDGVILLE 115 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.83	0.83	0.73	1.04	1.04	1.04	1.03	1.02	1.07	1.04	0.82	Garberville Area Reinforcement
HUMBOLDT 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
HARRIS 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
EUREKA 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
EUREKA A 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Garberville Area Reinforcement
HMBLT BY 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
RDGE CBN 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.61	0.62	0.55	1.02	1.02	1.04	1.04	1.04	1.06	1.02	0.61	Garberville Area Reinforcement
MPLE CRK 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.56	0.44	1.02	1.03	1.03	1.03	1.03	1.06	1.02	0.54	Garberville Area Reinforcement
RUSS RCH 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.54	0.55	0.43	1.02	1.02	1.03	1.03	1.03	1.06	1.02	0.53	Garberville Area Reinforcement
WILLWCRK 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.51	0.55	0.42	1.01	1.02	1.02	1.02	1.03	1.04	1.01	0.52	Garberville Area Reinforcement
HMBOBAYPPC 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
HOOPA 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.50	0.53	0.41	1.00	1.01	1.01	1.01	1.03	1.04	1.00	0.51	Garberville Area Reinforcement
HMBOBAYPPA 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Garberville Area Reinforcement
EEL RIVR 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.58	0.58	0.43	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.56	Garberville Area Reinforcement
SCOTIATP 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
NEWBURG 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.61	0.60	0.45	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.58	Garberville Area Reinforcement
PCLUMBER 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Garberville Area Reinforcement
CARLOTTA 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Garberville Area Reinforcement
RIO DELL 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
SWNS FLT 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.77	0.76	0.64	1.02	1.02	1.03	1.02	1.00	1.05	1.02	0.75	Garberville Area Reinforcement
SCTIATP2 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Garberville Area Reinforcement
BRDGVILLE 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.81	0.81	0.69	1.02	1.02	1.03	1.02	0.99	1.05	1.02	0.80	Garberville Area Reinforcement
FRUITLND 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.81	0.81	0.60	1.02	1.02	0.99	0.98	0.92	1.03	1.01	0.80	Garberville Area Reinforcement
FRT SWRD 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.82	0.81	0.60	1.02	1.03	0.98	0.96	0.92	1.03	1.01	0.80	Garberville Area Reinforcement
GRBRVILLE 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.83	0.82	0.60	1.03	1.03	0.96	0.95	0.91	1.03	1.02	0.82	Garberville Area Reinforcement

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
KEKAWAKA 60 kV	P2-3:A1:2:_HUMBOLDT - MA 115KV & HUMBOLDT BAY-HUMBOLDT #1 LINE	P2	Bus/Breaker	Low	0.85	0.84	0.64	1.02	1.03	0.97	0.95	0.92	1.03	1.02	0.83	Garberville Area Reinforcement
HUMBOLDT 115 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.96	0.96	0.79	0.97	0.97	0.97	0.97	0.97	1.07	0.97	0.96	Continue to monitor
BRDGVILLE 115 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.02	1.02	0.65	1.02	1.03	0.97	0.96	0.89	1.03	1.01	1.02	Continue to monitor
HMBOBAYPPB 115 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.98	0.98	0.81	0.99	0.99	0.99	0.99	0.99	1.07	0.99	0.98	Continue to monitor
HUMBOLDT 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.85	1.03	1.03	1.03	1.03	1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.84	1.03	1.03	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.83	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.83	1.03	1.04	1.03	1.03	1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.82	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
RDGE CBN 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.02	1.03	0.87	1.01	1.01	1.03	1.03	1.03	1.05	1.01	1.03	Continue to monitor
MPLE CRK 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.02	1.03	0.85	1.02	1.02	1.03	1.03	1.03	1.04	1.02	1.03	Continue to monitor
RUSS RCH 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.01	1.03	0.85	1.02	1.02	1.02	1.03	1.03	1.04	1.02	1.03	Continue to monitor
WILLWCRK 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.99	1.03	0.85	1.00	1.01	1.01	1.02	1.03	1.02	1.01	1.03	Continue to monitor
HMBOBAYPPC 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.82	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.99	1.03	0.84	1.00	1.01	1.01	1.01	1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.82	1.04	1.04	1.03	1.03	1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.01	1.01	0.75	1.02	1.03	1.01	1.01	0.99	1.03	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.73	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.01	1.01	0.74	1.02	1.03	1.01	1.00	0.98	1.03	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.02	1.02	0.72	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
CARLOTTA 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.02	1.02	0.72	1.02	1.02	1.00	0.99	0.96	1.03	1.01	1.02	Continue to monitor
RIO DELL 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.73	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.00	1.00	0.66	1.00	1.01	0.96	0.95	0.89	1.01	1.00	1.00	Continue to monitor
SCATIATP2 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.03	1.03	0.74	1.03	1.03	1.01	1.00	0.97	1.04	1.03	1.03	Continue to monitor
BRDGVILLE 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	1.00	0.99	0.64	1.00	1.01	0.95	0.94	0.87	1.01	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.98	0.98	0.56	0.99	1.02	0.93	0.91	0.81	1.00	0.98	0.98	Continue to monitor
FRT SWRD 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.98	0.98	0.56	1.00	1.02	0.91	0.89	0.81	1.00	0.98	0.97	Continue to monitor
GRBRVILLE 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.98	0.98	0.56	1.01	1.03	0.90	0.88	0.80	1.00	0.99	0.97	Continue to monitor
KEKAWAKA 60 kV	P2-3:A1:20:_BRDGVILLE 115KV - RING R1 & R3	P2	Bus/Breaker	Low	0.98	0.97	0.60	1.01	1.03	0.92	0.90	0.83	1.00	0.99	0.97	Continue to monitor
LOW GAP1 115 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.86	0.87	0.79	1.04	1.05	1.05	1.04	1.02	1.07	1.04	0.86	Install redundant relay
BRDGVILLE 115 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.83	0.83	0.73	1.04	1.04	1.04	1.03	1.02	1.07	1.04	0.82	Install redundant relay
HUMBOLDT 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Install redundant relay
HARRIS 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.54	0.39	1.03	1.03	1.03	1.03	1.03	1.08	1.03	0.52	Install redundant relay
EUREKA 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Install redundant relay
EUREKA A 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.54	0.54	0.39	1.03	1.04	1.03	1.03	1.03	1.08	1.03	0.52	Install redundant relay
HMBLT BY 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Install redundant relay
RDGE CBN 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.61	0.62	0.55	1.02	1.02	1.04	1.04	1.04	1.06	1.02	0.61	Install redundant relay
MPLE CRK 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.56	0.44	1.02	1.03	1.03	1.03	1.03	1.06	1.02	0.54	Install redundant relay
RUSS RCH 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.54	0.55	0.43	1.02	1.02	1.03	1.03	1.03	1.06	1.02	0.53	Install redundant relay
WILLWCRK 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.51	0.55	0.42	1.01	1.02	1.02	1.02	1.03	1.04	1.01	0.52	Install redundant relay
HMBOBAYPPC 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Install redundant relay
HOOPA 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.50	0.53	0.41	1.00	1.01	1.01	1.01	1.03	1.04	1.00	0.51	Install redundant relay
HMBOBAYPPA 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.55	0.54	0.39	1.04	1.04	1.03	1.03	1.03	1.07	1.04	0.52	Install redundant relay
EEL RIVR 60 kV	P5-5:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.58	0.58	0.43	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.56	Install redundant relay

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
SCOTIATP 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Install redundant relay
NEWBURG 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.61	0.60	0.45	1.02	1.03	1.03	1.02	1.01	1.06	1.02	0.58	Install redundant relay
PCLUMBER 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Install redundant relay
CARLOTTA 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.66	0.65	0.50	1.03	1.02	1.03	1.02	1.01	1.06	1.03	0.63	Install redundant relay
RIO DELL 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Install redundant relay
SWNS FLT 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.77	0.76	0.64	1.02	1.02	1.03	1.02	1.00	1.05	1.02	0.75	Install redundant relay
SCTIATP2 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.68	0.68	0.51	1.03	1.03	1.03	1.02	1.02	1.06	1.03	0.66	Install redundant relay
BRDGVILLE 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.81	0.81	0.69	1.02	1.02	1.03	1.02	0.99	1.05	1.02	0.80	Install redundant relay
FRUITLND 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.81	0.81	0.60	1.02	1.02	0.99	0.98	0.92	1.03	1.01	0.80	Install redundant relay
FRT SWRD 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.82	0.81	0.60	1.02	1.03	0.98	0.96	0.92	1.03	1.01	0.80	Install redundant relay
GRBRVILLE 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.83	0.82	0.60	1.03	1.03	0.96	0.95	0.91	1.03	1.02	0.82	Install redundant relay
KEKAWAKA 60 kV	P5-S:A1:1:_HUMBOLDT 115 KV BUS (FAILURE OF NON-REDUNDANT RELAY)	P5	Non-Redundant Relay	Low	0.85	0.84	0.64	1.02	1.03	0.97	0.95	0.92	1.03	1.02	0.83	Install redundant relay
LOW GAP1 115 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.78	1.04	1.04	1.05	1.04	1.02	1.07	1.04	Diverge	Install redundant battery supply
BRDGVILLE 115 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.72	1.04	1.04	1.04	1.03	1.02	1.07	1.04	Diverge	Install redundant battery supply
HUMBOLDT 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.03	1.03	1.03	1.03	1.03	1.08	1.03	Diverge	Install redundant battery supply
HARRIS 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.03	1.03	1.03	1.03	1.03	1.08	1.03	Diverge	Install redundant battery supply
EUREKA 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.03	1.04	1.03	1.03	1.03	1.08	1.03	Diverge	Install redundant battery supply
EUREKA A 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.35	1.03	1.04	1.03	1.03	1.03	1.08	1.03	Diverge	Install redundant battery supply
HMBLT BY 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Install redundant battery supply
RDGE CBN 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.45	1.02	1.02	1.03	1.03	1.03	1.06	1.03	Diverge	Install redundant battery supply
MPLER CRK 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.38	1.02	1.03	1.03	1.03	1.03	1.06	1.02	Diverge	Install redundant battery supply
RUSS RCH 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.38	1.02	1.02	1.02	1.03	1.03	1.06	1.02	Diverge	Install redundant battery supply
WILLWCRK 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.01	1.02	1.01	1.02	1.03	1.04	1.01	Diverge	Install redundant battery supply
HMBOBAYPPC 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Install redundant battery supply
HOOPA 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.35	1.00	1.01	1.01	1.01	1.03	1.03	1.00	Diverge	Install redundant battery supply
HMBOBAYPPA 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.36	1.04	1.04	1.03	1.03	1.03	1.07	1.04	Diverge	Install redundant battery supply
EEL RIVR 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.40	1.02	1.03	1.03	1.02	1.01	1.06	1.02	Diverge	Install redundant battery supply
SCOTIATP 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Install redundant battery supply
NEWBURG 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.43	1.02	1.03	1.03	1.02	1.01	1.06	1.02	Diverge	Install redundant battery supply
PCLUMBER 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.48	1.02	1.02	1.03	1.02	1.01	1.06	1.02	Diverge	Install redundant battery supply
CARLOTTA 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.48	1.02	1.02	1.03	1.02	1.01	1.06	1.02	Diverge	Install redundant battery supply
RIO DELL 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Install redundant battery supply

Study Area: **PG&E Humboldt**

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
SWNS FLT 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.62	1.02	1.01	1.03	1.02	1.00	1.05	1.02	Diverge	Install redundant battery supply
SCTIATP2 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.49	1.03	1.03	1.03	1.02	1.02	1.06	1.03	Diverge	Install redundant battery supply
BRDGVLE 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.68	1.02	1.01	1.03	1.02	0.99	1.05	1.02	Diverge	Install redundant battery supply
FRUITLND 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.60	1.01	1.02	0.99	0.98	0.92	1.03	1.01	Diverge	Install redundant battery supply
FRT SWRD 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.59	1.01	1.03	0.98	0.96	0.92	1.03	1.01	Diverge	Install redundant battery supply
GRBRVLE 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.59	1.02	1.03	0.96	0.95	0.91	1.03	1.02	Diverge	Install redundant battery supply
KEKAWAKA 60 kV	P5-SC:A1:1:_HUMBOLDT 115KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	Diverge	Diverge	0.64	1.02	1.03	0.97	0.95	0.92	1.03	1.01	Diverge	Install redundant battery supply
FRUITLND 60 kV	P5-SC:A1:2:_BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	0.50	0.49	0.42	1.03	1.03	0.49	0.47	0.41	0.53	1.03	0.49	Install redundant battery supply
FRT SWRD 60 kV	P5-SC:A1:2:_BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	0.50	0.50	0.43	1.03	1.03	0.48	0.46	0.43	0.53	1.03	0.50	Install redundant battery supply
GRBRVLE 60 kV	P5-SC:A1:2:_BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	0.51	0.51	0.45	1.03	1.03	0.48	0.47	0.45	0.54	1.03	0.51	Install redundant battery supply
KEKAWAKA 60 kV	P5-SC:A1:2:_BRIDGEVILLE 115-60KV BATT(FAILURE OF NON-REDUNDANT BATT)	P5	Non-Redundant battery supply	Low	0.55	0.54	0.50	1.03	1.03	0.53	0.52	0.50	0.57	1.03	0.54	Install redundant battery supply
FRUITLND 60 kV	P7-1:A1:1:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.89	0.97	1.01	0.94		0.89	1.03	0.96	0.96	Continue to monitor
FRT SWRD 60 kV	P7-1:A1:1:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.96	0.96	0.88	0.97	1.02	0.93		0.88	1.02	0.96	0.96	Continue to monitor
GRBRVLE 60 kV	P7-1:A1:1:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.88	0.98	1.03	0.92		0.88	1.03	0.97	0.97	Continue to monitor
KEKAWAKA 60 kV	P7-1:A1:1:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.89	0.98	1.03	0.93		0.89	1.02	0.97	0.97	Continue to monitor
HUMBOLDT 115 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.95	0.96	0.82	0.97	0.97	0.96		0.96	1.07	0.97	0.96	Continue to monitor
LOW GAP1 115 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.98	1.00	0.89	Not Found	1.01	1.01		1.00	1.07	1.00	1.00	Continue to monitor
BRDGVLE 115 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.97	0.99	0.86	1.00	1.00	1.00		0.99	1.07	1.00	0.99	Continue to monitor
HUMBOLDT 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.03	1.03	0.89	1.03	1.03	1.03		1.03	1.06	1.03	1.03	Continue to monitor
HARRIS 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.02	1.03	0.88	1.03	1.03	1.03		1.03	1.05	1.03	1.03	Continue to monitor
EUREKA 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.01	1.03	0.87	1.03	1.04	1.03		1.03	1.05	1.03	1.03	Continue to monitor
EUREKA A 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.01	1.03	0.86	1.03	1.04	1.03		1.03	1.05	1.03	1.03	Continue to monitor
HMBLT BY 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.01	1.02	0.86	1.04	1.04	1.03		1.03	1.05	1.04	1.02	Continue to monitor
MPLE CRK 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.03	0.89	1.02	1.03	1.03		1.03	1.04	1.02	1.03	Continue to monitor
RUSS RCH 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.03	0.90	1.02	1.02	1.02		1.03	1.04	1.02	1.03	Continue to monitor
WILLWCRK 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.98	1.03	0.90	1.01	1.02	1.01		1.03	1.02	1.01	1.03	Continue to monitor
HMBOBAYPPC 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.01	1.02	0.86	1.04	1.04	1.03		1.03	1.05	1.04	1.02	Continue to monitor
HOOPA 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.97	1.03	0.89	1.00	1.01	1.01		1.03	1.02	1.00	1.03	Continue to monitor
HMBOBAYPPA 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.01	1.02	0.86	1.04	1.04	1.03		1.03	1.05	1.04	1.02	Continue to monitor
EEL RIVR 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.01	0.83	1.02	1.03	1.02		1.01	1.05	1.02	1.01	Continue to monitor
SCOTIATP 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.02	1.03	0.84	1.03	1.03	1.02		1.01	1.05	1.03	1.03	Continue to monitor
NEWBURG 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.01	0.83	1.02	1.03	1.02		1.01	1.05	1.02	1.01	Continue to monitor
PCLUMBER 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.01	0.83	1.02	1.02	1.01		1.00	1.05	1.02	1.01	Continue to monitor
CARLOTTA 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.00	1.01	0.83	1.02	1.02	1.01		1.00	1.05	1.02	1.01	Continue to monitor
RIO DELL 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.02	1.03	0.84	1.03	1.03	1.02		1.01	1.05	1.03	1.03	Continue to monitor
SWNS FLT 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.98	0.99	0.84	1.00	1.00	0.99		0.98	1.05	1.00	0.99	Continue to monitor
SCTIATP2 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	1.02	1.03	0.84	1.03	1.03	1.02		1.01	1.05	1.03	1.03	Continue to monitor
BRDGVLE 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.97	0.99	0.84	0.99	0.99	0.98		0.97	1.05	0.99	0.99	Continue to monitor
FRUITLND 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.96	0.97	0.77	1.00	1.01	0.95		0.90	1.04	0.99	0.96	Continue to monitor
FRT SWRD 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.96	0.96	0.77	1.00	1.02	0.94		0.90	1.03	0.99	0.96	Continue to monitor
GRBRVLE 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.97	0.97	0.77	1.01	1.03	0.93		0.89	1.03	1.00	0.97	Continue to monitor
KEKAWAKA 60 kV	P7-1:A1:2:_HUMBOLDT BAY & HUMBOLDT BAY LINES	P7	DCTL	Low	0.97	0.97	0.79	1.01	1.03	0.94		0.90	1.03	1.00	0.97	Continue to monitor
FRUITLND 60 kV	P7-1:A1:5:_ESSEX JCT-ARCATA-FAIRHAVEN & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.88	0.98	1.01	0.94		0.89	1.03	0.97	0.96	Continue to monitor
FRT SWRD 60 kV	P7-1:A1:5:_ESSEX JCT-ARCATA-FAIRHAVEN & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.96	0.96	0.88	0.98	1.02	0.93		0.89	1.02	0.97	0.96	Continue to monitor

Study Area: **PG&E Humboldt**



High/Low Voltages

Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
GRBRVLE 60 kV	P7-1:A1:5:_ESSEX JCT-ARCATA-FAIRHAVEN & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.87	0.99	1.03	0.92		0.88	1.03	0.98	0.97	Continue to monitor
KEKAWAKA 60 kV	P7-1:A1:5:_ESSEX JCT-ARCATA-FAIRHAVEN & FAIRHAVEN-HUMBOLDT LINES	P7	DCTL	Low	0.97	0.97	0.89	0.99	1.03	0.93		0.90	1.02	0.98	0.97	Continue to monitor
FRUITLND 60 kV	P7-1:A1:6:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT & HUMBOLDT #1 LINES	P7	DCTL	Low	0.97	0.97	0.89	0.97	1.01	0.94		0.88	1.03	0.96	0.96	Continue to monitor
FRT SWRD 60 kV	P7-1:A1:6:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT & HUMBOLDT #1 LINES	P7	DCTL	Low	0.96	0.96	0.88	0.97	1.02	0.93		0.88	1.02	0.96	0.96	Continue to monitor
GRBRVLE 60 kV	P7-1:A1:6:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT & HUMBOLDT #1 LINES	P7	DCTL	Low	0.96	0.97	0.88	0.98	1.03	0.92		0.87	1.03	0.97	0.97	Continue to monitor
KEKAWAKA 60 kV	P7-1:A1:6:_ARCATA-HUMBOLDT & FAIRHAVEN-HUMBOLDT & HUMBOLDT #1 LINES	P7	DCTL	Low	0.97	0.97	0.89	0.98	1.03	0.93		0.89	1.02	0.97	0.97	Continue to monitor
BRDGVLE 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.55	0.46	0.98	0.99	0.98	0.97	0.96	1.07	0.98	0.54	Generation redispatch
BRDGVLE 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.55	0.46	0.98	0.99	0.97	0.97	0.95	1.06	0.98	0.55	Generation redispatch
CARLOTTA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.59	0.47	1.02	1.02	1.01	1.00	1.00	1.05	1.02	0.58	Generation redispatch
EEL RIVR 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.46	1.02	1.03	1.02	1.01	1.01	1.04	1.02	0.56	Generation redispatch
EUREKA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.03	1.04	1.03	1.03	1.03	1.05	1.03	0.56	Generation redispatch
EUREKA A 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.03	1.04	1.03	1.03	1.03	1.05	1.03	0.56	Generation redispatch
FRT SWRD 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.46	0.96	1.00	0.91	0.90	0.87	1.03	0.94	0.56	Generation redispatch
FRUITLND 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.55	0.45	0.96	1.00	0.92	0.92	0.87	1.04	0.95	0.55	Generation redispatch
GRBRVLE 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.57	0.48	0.96	1.02	0.90	0.89	0.86	1.03	0.95	0.57	Generation redispatch
HARRIS 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.57	0.49	1.03	1.03	1.03	1.03	1.03	1.05	1.03	0.57	Generation redispatch
HMBLT BY 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.04	1.04	1.03	1.03	1.03	1.05	1.04	0.56	Generation redispatch
HMBOBAYPPA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.04	1.04	1.03	1.03	1.03	1.05	1.04	0.56	Generation redispatch
HMBOBAYPPC 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.04	1.04	1.03	1.03	1.03	1.05	1.04	0.56	Generation redispatch
HOOPA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.48	1.00	1.01	1.01	1.01	1.03	1.02	1.00	0.55	Generation redispatch
HUMBOLDT 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.53	0.46	0.97	0.97	0.96	0.96	0.97	1.07	0.97	0.53	Generation redispatch
HUMBOLDT 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.57	0.49	1.03	1.03	1.03	1.03	1.03	1.05	1.03	0.57	Generation redispatch
KEKAWAKA 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.61	0.54	0.96	1.02	0.91	0.91	0.88	1.03	0.95	0.61	Generation redispatch

Study Area: **PG&E Humboldt**



High/Low Voltages

Substation	Contingency (All and Worst P6)	Category	Category Description	High/Low Voltage	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)			Project & Potential Mitigation Solutions
					2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast	
LOW GAP1 115 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:2:_HUMBOLDT-TRINITY 115KV [1820] MOAS OPENED ON TRINITY JESSTAP	P6	N-1-1	Low	Diverge	Diverge	0.67	1.00	1.00	1.00	1.00	1.00	1.06	1.00	Diverge	Generation redispatch
MPLC CRK 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.58	0.52	1.02	1.02	1.03	1.03	1.03	1.04	1.02	0.58	Generation redispatch
NEWBURG 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.57	0.46	1.02	1.03	1.01	1.01	1.00	1.05	1.02	0.57	Generation redispatch
PCLUMBER 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.59	0.47	1.02	1.02	1.01	1.00	1.00	1.05	1.02	0.58	Generation redispatch
RDGE CBN 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.62	0.58	1.01	1.01	1.03	1.03	1.03	1.05	1.01	0.62	Generation redispatch
RIO DELL 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.62	0.49	1.03	1.03	1.02	1.01	1.01	1.05	1.03	0.61	Generation redispatch
RIODLLTP 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.59	0.47	1.02	1.02	1.01	1.01	1.00	1.05	1.02	0.58	Generation redispatch
RUSS RCH 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.58	0.51	1.01	1.02	1.02	1.03	1.03	1.04	1.02	0.58	Generation redispatch
SWNS FLT 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.56	0.46	0.99	1.00	0.98	0.97	0.96	1.06	0.99	0.56	Generation redispatch
WILLWCRK 60 kV	P1-2:A1:4:_HUMBOLDT BAY-HUMBOLDT #1 115KV [1800] & P1-2:A1:3:_BRIDGEVILLE-COTTONWOOD 115KV [1110]	P6	N-1-1	Low	Diverge	0.57	0.49	1.00	1.01	1.01	1.02	1.03	1.02	1.00	0.57	Generation redispatch

Study Area: **PG&E Humboldt**

**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	
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast		
HOOPA 60 kV	P1-2:A1:14:_ HUMBOLDT-MAPLE CREEK 60KV [7130] MOAS OPENED ON HUMBOLDT_MPLE CRK	P1	N-1	12	<8	<8	<8	<8	4	<8	<8	<8	<8	<8	<8	Project: Willow Creek voltage support
WILLWCRC 60 kV	P1-2:A1:14:_ HUMBOLDT-MAPLE CREEK 60KV [7130] MOAS OPENED ON HUMBOLDT_MPLE CRK	P1	N-1	11	<8	<8	<8	<8	4	<8	<8	<8	<8	<8	<8	Project: Willow Creek voltage support
NEWBURG 60 kV	P1-2:A1:16:_ HUMBOLDT BAY-RIO DELL ICT 60KV [7100] MOAS OPENED ON EEL RIVR_NEWBURG	P1	N-1	<8	<8	10	<8	<8	2	<8	<8	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:24:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	48	48	52	<8	-1	48	49	52	48	<8	50	<8	Garberville Area Reinforcement
FRUITLND 60 kV	P1-2:A1:24:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	48	49	53	<8	-2	48	49	54	48	<8	50	<8	Garberville Area Reinforcement
GRBRVLE 60 kV	P1-2:A1:24:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	47	48	49	<8	0	47	48	49	47	<8	49	<8	Garberville Area Reinforcement
KEKAWAKA 60 kV	P1-2:A1:24:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON BRDGVILLE_FRUTLDJT	P1	N-1	43	44	44	<8	0	43	43	44	44	<8	45	<8	Garberville Area Reinforcement
GRBRVLE 60 kV	P1-2:A1:25:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON FTSWRDJT_GRBRVLE	P1	N-1	19	24	39	<8	0	41	41	39	13	<8	25	<8	Garberville Area Reinforcement
KEKAWAKA 60 kV	P1-2:A1:25:_ BRIDGEVILLE-GARBERVILLE 60KV [6220] MOAS OPENED ON FTSWRDJT_GRBRVLE	P1	N-1	18	22	35	<8	0	36	36	35	12	<8	23	<8	Garberville Area Reinforcement
BRDGVLE 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
BRDGVLE 115 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
CARLOTTA 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
EEL RIVR 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
EUREKA 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
EUREKA A 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
FRUITLND 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HARRIS 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBLT BY 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBOBAYPPA 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBOBAYPPC 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HOOPA 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	13	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HUMBOLDT 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HUMBOLDT 115 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	1	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
KEKAWAKA 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	10	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
LOW GAP1 115 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	10	<8	-1	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
NEWBURG 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
PCLUMBER 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
RIO DELL 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SCOTIATP 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SCTIATP2 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	14	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SWNS FLT 60 kV	P1-2:A1:4:_ HUMBOLDT BAY-HUMBOLDT #1 115KV [1800]	P1	N-1	<8	<8	12	<8	0	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-2:A1:5:_ KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	<8	<8	27	<8	0	9	12	16	<8	<8	<8	<8	Continue to monitor
FRUITLND 60 kV	P1-2:A1:5:_ KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	<8	<8	23	<8	0	<8	9	13	<8	<8	<8	<8	Continue to monitor
GRBRVLE 60 kV	P1-2:A1:5:_ KEKAWAKA-GRBRVLE-LYTNVLE 60KV [0]	P1	N-1	<8	<8	33	<8	<8	12	15	20	<8	<8	<8	<8	Continue to monitor
BRDGVLE 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	9	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	13	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
FRUITLND 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	13	<8	<8	<8	<8	9	<8	<8	<8	<8	Continue to monitor
GRBRVLE 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	13	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
KEKAWAKA 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	11	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
SWNS FLT 60 kV	P1-3:A1:3:_ BRDGVLE 115/60KV TB 1	P1	N-1	<8	<8	11	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
BRDGVLE 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
BRDGVLE 115 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
CARLOTTA 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
EEL RIVR 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
EUREKA 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
EUREKA A 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor
FRUITLND 60 kV	P1-3:A1:4:_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	8	<8	<8	<8	<8	Continue to monitor

Study Area: **PG&E Humboldt**

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
				2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity	2027 SP High CEC Forecast		
GRBRVLE 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HARRIS 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBL BY 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBOBAYPPA 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HMBOBAYPPC 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HOOPA 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	13	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HUMBOLDT 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
HUMBOLDT 115 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
KEKAWAKA 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	10	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
LOW GAP1 115 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	10	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
NEWBURG 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
PCLUMBER 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
RIO DELL 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SCOTIATP 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SCTIATP2 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	14	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
SWNS FLT 60 kV	P1-3:A1:4_ HMBOBAYPPB 115/13.8KV TB 1	P1	N-1	<8	<8	12	<8	<8	<8	<8	<8	<8	<8	<8	<8	Continue to monitor
FRT SWRD 60 kV	P1-4:A1:5_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	<8	<8	8	<8	<8	9	9	8	<8	<8	<8	Continue to monitor	
GRBRVLE 60 kV	P1-4:A1:5_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	10	10	11	10	<8	11	12	10	10	10	10	Garberville Area Reinforcement	
KEKAWAKA 60 kV	P1-4:A1:5_ GRBRVLE 60.00KV ID=8H & GRBRVLE 60.00KV ID=7H & GRBRVLE 60.00KV ID=5H & GRBRVLE 60.00KV ID=V SHUNT DEVICES	P1	N-1	9	8	9	8	<8	10	10	9	8	9	8	Garberville Area Reinforcement	

Study Area: **PG&E Humboldt**

Transient Stability



Contingency	Category	Category Description	Transient Stability Performance						Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios			
			2024 Spring Off-Peak	2027 Summer Peak	2032 Summer Peak	2032 Spring Off-Peak	2024 SP Heavy Renewable & Min Gas Gen	2027 SP High CEC Forecast	

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

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

**Single Contingency Load Drop**

Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions	
			2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity		2027 SP High CEC Forecast

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

Study Area: **PG&E Humboldt**



**Single Source Substation with more than 100 MW Load**

Substation	Load Served (MW)										Potential Mitigation Solutions	
	2024 Summer Peak	2027 Summer Peak	2032 Summer Peak	2024 Spring Off-Peak	2027 Spring Off-Peak	2024 Winter Peak	2027 Winter Peak	2032 Winter Peak	2024 SP Heavy Renewable & Min Gas Gen	2024 OP Sensitivity		2027 SP High CEC Forecast

No single source substation with more than 100 MW