Study Area: **PG&E Humboldt - Summer Peak**

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-T-1	Humboldt Bay - Humboldt #2 60kV line	Humboldt Bay - Humboldt No.1 60 kV Line (HUMBOLDT-HMBLT JT & Humboldt Bay - Eureka 60 kV Line	C3	L-1-1	109%	108%	109%	Adjust generation at Humboldt Bay
HUMB-SP-T-2	Humboldt - Eureka 60kV (Between HARRIS & HARRIS ST)	Humboldt Bay - Humboldt No.1 60 kV Line (HUMBOLDT-HMBLT JT & Humboldt Bay - Humboldt No.2 60 kV Line	C3	L-1-1	117%	114%	111%	Implement operating procedure to reduce output from Humboldt Bay 60 kV generation following first contingency for Category C
HUMB-SP-T-3	Humboldt - Eureka 60kV (HARRIS ST & EUREKA)		C3	L-1-1	124%	121%	118%	
HUMB-SP-T-4	Garberville - Laytonville 60kV line(between Garberville to Kekawaka)	HMBLT & B3_2_Bridgeville 60/12 kV Transformer	C3	L-1-1	97%	100%	<95%	Bridgeville - Garberville 115kV line
HUMB-SP-T-5	Laytonville - Willits 60kV line		C3	L-1-1	112%	115%	<95%	
HUMB-SP-T-6	Essex Jct - Arcata - Fairhaven 60kV line (Between Janes Crk TP - Arcata JCT2)	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	97%	103%	116%	Increase Bluke lake power generation. Drop load at Orick, Big Lagoon if overload persists.
HUMB-SP-T-7	Essex Jct - Arcata - Fairhaven 60kV line (Between Fairhaven - Arcata JCT2)	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	106%	114%	128%	Increase output from Blue Lake power. Drop load at Fairhaven if overload persists.
HUMB-SP-T-8	Fairhaven - Humboldt 60kV line(Between Arcata JCT2 - Sierra Pac Lumber Sub Tap)	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	<95%	<95%	104%	Increase output from area generation. Drop load at Fairhaven / S.Pac Lumber sub if overload persists.
HUMB-SP-T-9	Fairhaven - Humboldt 60kV line(Between Fairhaven - Sierra Pac Lumber Sub Tap)	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	<95%	<95%	102%	

San Onofre Nuclear Generation Station was retired on June 7, 2013 and therefore was removed from the base cases used for the 2013/14 ISO transmission planning process.

Study Area: **PG&E Humboldt - Winter Peak**

California ISO
Shaping a Renewed Future

Thermal Overloads

ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-T-1	Essex Jct - Arcata - Fairhaven 60kV line (Between Fairhaven - Arcata JCT2)	Essex Jct - Arcata - Fairhaven 60 kV Line (LP_FLKBD-JANS CR & Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA)	C3	L-1-1	<95%	94%	102%	Increase output from Blue Lake power. Drop load at Fairhaven if overload persists.
HUMB-WP-T-2	Essex Jct - Arcata - Fairhaven 60kV line (Between Fairhaven - Arcata JCT2)	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	<95%	94%	102%	
HUMB-WP-T-3	Humboldt Bay - Eureka 60kV line	Humboldt Bay - Humboldt No.1 60 kV Line (HUMBOLDT-HMBLT JT & Humboldt Bay - Humboldt No.2 60 kV Line	C3	L-1-1	137%	133%	134%	Implement operating procedure to reduce output from Humboldt Bay 60 kV generation following first contingency for Category C

Study Area: **PG&E Humboldt - Summer Peak**

California ISO
Shaping a Renewed Future

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-VD-1	ORICK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA)	B	L-1	5.57%	6.27%	7.36%	Adjust output from Blue Lake power.
HUMB-SP-VD-2	ARCATA 60kV		B	L-1	5.81%	6.48%	7.51%	
HUMB-SP-VD-3	SIMPSON 60kV		B	L-1	5.45%	6.14%	7.24%	
HUMB-SP-VD-4	BCHIPMIL 60kV		B	L-1	5.46%	6.14%	7.21%	
HUMB-SP-VD-5	BIG_LAGN 60kV		B	L-1	5.56%	6.25%	7.35%	
HUMB-SP-VD-6	BLUE LKE 60kV		B	L-1	5.45%	6.14%	7.23%	
HUMB-SP-VD-7	TRINIDAD 60kV		B	L-1	5.55%	6.24%	7.33%	
HUMB-SP-VD-8	BRDGVLLE 60kV	Bridgeville 60/12 kV Transformer	B	T-1	6.50%	<5%	<5%	Adjust Humboldt 60kV generation
HUMB-SP-VD-9	SWNS FLT 60kV		B	T-1	5.60%	<5%	<5%	
HUMB-SP-VD-10	COVELO6 60kV	BUS FAULT AT 31110 BRDGVLLE 60.00	C1	Bus	Not Solved	<5%	<5%	Case not solved. Bridgeville - Garberville 115kV line will mitigate the problem. In the interim drop load at Garberville.
HUMB-SP-VD-11	FRT SWRD 60kV		C1	Bus	Not Solved	<5%	<5%	
HUMB-SP-VD-12	FRUITLND 60kV		C1	Bus	Not Solved	<5%	<5%	
HUMB-SP-VD-13	GRBRVLLE 60kV		C1	Bus	Not Solved	<5%	<5%	
HUMB-SP-VD-14	KEKAWAKA 60kV		C1	Bus	Not Solved	<5%	<5%	
HUMB-SP-VD-15	LYTNVLLE 60kV		C1	Bus	Not Solved	<5%	<5%	

Study Area: **PG&E Humboldt - Summer Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-VD-16	JANS CRK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA) & Essex Jct - Arcata - Fairhaven 60 kV Line (LP_FLKBD-JANS CR	C3	L-1-1	14.26%	15.85%	19.73%	Adjust output from Blue Lake power.
HUMB-SP-VD-17	ORICK 60kV		C3	L-1-1	10.89%	12.00%	15.85%	
HUMB-SP-VD-18	ARCATA 60kV		C3	L-1-1	10.94%	12.07%	15.61%	
HUMB-SP-VD-19	SIMPSON 60kV		C3	L-1-1	10.75%	11.84%	15.56%	
HUMB-SP-VD-20	BCHIPMIL 60kV		C3	L-1-1	10.69%	11.78%	15.46%	
HUMB-SP-VD-21	BIG_LAGN 60kV		C3	L-1-1	10.87%	11.98%	15.81%	
HUMB-SP-VD-22	BLUE LKE 60kV		C3	L-1-1	10.74%	11.83%	15.55%	
HUMB-SP-VD-23	TRINIDAD 60kV		C3	L-1-1	10.85%	11.96%	15.77%	
HUMB-SP-VD-24	BRDGVLLE 60kV	Rio Dell Tap 60 kV Line(SCOTIATP-RIODLLTP) & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	34.10%	31.37%	<5%	Bridgeville - Garberville 115kV line
HUMB-SP-VD-25	CARLOTTA 60kV		C3	L-1/T-1	34.28%	31.61%	<5%	
HUMB-SP-VD-26	FRT SWRD 60kV		C3	L-1/T-1	29.62%	28.37%	<5%	
HUMB-SP-VD-27	FRUITLND 60kV		C3	L-1/T-1	30.53%	28.98%	<5%	
HUMB-SP-VD-28	GRBRVLLE 60kV		C3	L-1/T-1	28.51%	27.71%	<5%	
HUMB-SP-VD-29	LYTNVLLE 60kV		C3	L-1/T-1	15.63%	16.05%	<5%	
HUMB-SP-VD-30	PCLUMBER 60kV		C3	L-1/T-1	34.28%	31.61%	<5%	

Study Area: **PG&E Humboldt - Summer Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-VD-31	SWNS FLT 60kV		C3	L-1/T-1	34.15%	31.44%	<5%	

Study Area: **PG&E Humboldt - Winter Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-VD_1	ORICK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA)	B	L-1	<5%	5.32%	6.01%	Adjust Blue Lake power generation
HUMB-WP-VD_2	ARCATA 60kV		B	L-1	<5%	5.65%	6.33%	
HUMB-WP-VD_3	SIMPSON 60kV		B	L-1	<5%	5.11%	5.79%	
HUMB-WP-VD_4	BIG_LAGN 60kV		B	L-1	<5%	5.31%	5.99%	
HUMB-WP-VD_5	BLUE LKE 60kV		B	L-1	<5%	5.12%	5.80%	
HUMB-WP-VD_6	TRINIDAD 60kV		B	L-1	<5%	5.30%	5.98%	
HUMB-WP-VD_7	FRT SWRD 60kV	Bridgeville - Garberville 115kV line	B	L-1	<5%	<5%	5.06%	Adjust Humboldt 60kV generation
HUMB-WP-VD_8	GRBRVLLE 60kV		B	L-1	<5%	<5%	5.38%	
HUMB-WP-VD_9	MPLE CRK 60kV	Humboldt - Maple Creek 60 kV Line	B	L-1	9.05%	<5%	<5%	Maple Creek Reactive Support project
HUMB-WP-VD_10	RDGE CBN 60kV		B	L-1	7.15%	<5%	<5%	
HUMB-WP-VD_11	RUSS RCH 60kV		B	L-1	9.12%	<5%	<5%	
HUMB-WP-VD_12	HOOPA 60kV		B	L-1	9.47%	<5%	<5%	
HUMB-WP-VD_13	WILLWCRK 60kV		B	L-1	9.35%	<5%	<5%	
HUMB-WP-VD_14	COVELO6 60kV		C1	Bus	<5%	Not Solved	<5%	
HUMB-WP-VD_15	FRT SWRD 60kV		C1	Bus	<5%	Not Solved	<5%	

Study Area: **PG&E Humboldt - Winter Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-VD_16	FRUITLND 60kV	BUS FAULT AT 31110 BRDGVLLE 60.00	C1	Bus	<5%	Not Solved	<5%	Bridgeville - Garberville 115kV line project. In the interim drop load at Garberville to solve for this contingency.
HUMB-WP-VD_17	GRBRVLLE 60kV		C1	Bus	<5%	Not Solved	<5%	
HUMB-WP-VD_18	KEKAWAKA 60kV		C1	Bus	<5%	Not Solved	<5%	
HUMB-WP-VD_19	LYTNVLLE 60kV		C1	Bus	<5%	Not Solved	<5%	
HUMB-WP-VD_20	JANS CRK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA) &Essex Jct - Arcata - Fairhaven 60 kV Line (LP_FLKBD-JANS CR	C3	L-1-1	<5%	15.27%	17.93%	Adjust Blue Lake power generation
HUMB-WP-VD_21	ORICK 60kV		C3	L-1-1	<5%	12.17%	14.46%	
HUMB-WP-VD_22	ARCATA 60kV		C3	L-1-1	<5%	12.07%	14.35%	
HUMB-WP-VD_23	SIMPSON 60kV		C3	L-1-1	<5%	12.04%	14.19%	
HUMB-WP-VD_24	BIG_LAGN 60kV		C3	L-1-1	<5%	12.15%	14.43%	
HUMB-WP-VD_25	BLUE LKE 60kV		C3	L-1-1	<5%	12.03%	14.19%	
HUMB-WP-VD_26	TRINIDAD 60kV		C3	L-1-1	<5%	12.13%	14.40%	
HUMB-WP-VD_27	HOOPA 60kV	Humboldt - Bridgeville 115 kV Line & Humboldt - Maple Creek 60 kV Line	C3	L-1-1	10.53%	<5%	<5%	Maple Creek Reactive Support project
HUMB-WP-VD_28	MPLE CRK 60kV		C3	L-1-1	10.05%	0.00%	<5%	
HUMB-WP-VD_29	RUSS RCH 60kV		C3	L-1-1	10.14%	<5%	<5%	
HUMB-WP-VD_30	WILLWCRK 60kV		C3	L-1-1	10.40%	<5%	<5%	

Study Area: **PG&E Humboldt - Winter Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-VD_31	COVELO6 60kV	Rio Dell Tap 60 kV Line(SCOTIATP-RIODLLTP) & Bridgeville 60/12 kV Transformer	C3	L-1/T-1	<5%	18.18%	<5%	Bridgeville - Garberville 115kV line project
HUMB-WP-VD_32	BRDGVLLE 60kV		C3	L-1/T-1	16.00%	35.20%	<5%	
HUMB-WP-VD_33	CARLOTTA 60kV		C3	L-1/T-1	16.18%	35.37%	<5%	
HUMB-WP-VD_34	FRT SWRD 60kV		C3	L-1/T-1	13.28%	31.92%	<5%	
HUMB-WP-VD_35	FRUITLND 60kV		C3	L-1/T-1	13.77%	32.56%	<5%	
HUMB-WP-VD_36	GRBRVLLE 60kV		C3	L-1/T-1	12.84%	31.20%	<5%	
HUMB-WP-VD_37	KEKAWAKA 60kV		C3	L-1/T-1	11.99%	28.72%	<5%	
HUMB-WP-VD_38	LYTNVLLE 60kV		C3	L-1/T-1	<5%	17.99%	<5%	
HUMB-WP-VD_39	PCLUMBER 60kV		C3	L-1/T-1	16.18%	35.37%	<5%	
HUMB-WP-VD_40	SWNS FLT 60kV		C3	L-1/T-1	16.05%	35.25%	<5%	
HUMB-WP-VD_41	ORICK 60kV	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	<5%	13.88%	16.51%	Adjust Blue Lake power generation
HUMB-WP-VD_42	ARCATA 60kV		C5	L-2	<5%	12.72%	15.13%	
HUMB-WP-VD_43	SIMPSON 60kV		C5	L-2	<5%	13.52%	16.10%	
HUMB-WP-VD_44	BIG_LAGN 60kV		C5	L-2	<5%	13.86%	16.48%	
HUMB-WP-VD_45	BLUE LKE 60kV		C5	L-2	<5%	13.53%	16.10%	

Study Area: **PG&E Humboldt - Winter Peak**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-VD_46	JANS CRK 60kV		C5	L-2	<5%	15.27%	17.92%	
HUMB-WP-VD_47	TRINIDAD 60kV		C5	L-2	<5%	13.83%	16.45%	

Study Area: **PG&E Humboldt - Summer Off-Peak & Summer Light Load**

Voltage Deviations

ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
HUMB-NP-VD-1	BRDGVLLE	Bridgeville 115/60 kV Transformer	B	T-1	<5%	6.05%		Adjust Humboldt 60kV generation
HUMB-NP-VD-2	COVELO6 60kV	Humboldt Bay - Rio Dell Jct 60kV line & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	Not Solved	<10%		Case does not solve. Bridgeville - Garberville 115kV line will mitigate the issue. In the interim drop load at Rio Dell, Carlotta, Bridgeville, Fruitland, Fortseward, Garberville depending on the need.
HUMB-NP-VD-3	BRDGVLLE 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-4	CARLOTTA 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-5	FRT SWRD 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-6	FRUITLND 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-7	GRBRVLLE 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-8	KEKAWAKA 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-9	LYTNVLLE 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-10	PCLUMBER 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-11	RIO DELL 60kV		C3	L-1/T-1	Not Solved	<10%		
HUMB-NP-VD-12	SWNS FLT 60kV		C3	L-1/T-1	Not Solved	<10%		

Study Area: **PG&E Humboldt - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-V-1	COVELO6 60kV	BUS FAULT AT 31110 BRDGVLLE 60.00	C1	Bus	0.88	>0.9	>0.9	Bridgeville - Garberville 115kV line
HUMB-SP-V-2	FRT SWRD 60kV		C1	Bus	0.80	>0.9	>0.9	
HUMB-SP-V-3	FRUITLND 60kV		C1	Bus	0.79	>0.9	>0.9	
HUMB-SP-V-4	GRBRVLLE 60kV		C1	Bus	0.81	>0.9	>0.9	
HUMB-SP-V-5	KEKAWAKA 60kV		C1	Bus	0.82	>0.9	>0.9	
HUMB-SP-V-6	LYTNVLLE 60kV		C1	Bus	0.88	>0.9	>0.9	
HUMB-SP-V-7	COVELO6 60kV	Rio Dell Tap 60 kV Line(SCOTIATP-RIODLLTP) & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	Not Solved	Not Solved	>0.9	Case not solved. Bridgeville - Garberville 115kV line project mitigates the problem. In the interim drop load at Garberville to solve the case.
HUMB-SP-V-8	BRDGVLLE 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-9	CARLOTTA 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-10	FRT SWRD 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-11	FRUITLND 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-12	GRBRVLLE 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-13	KEKAWAKA 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-14	LYTNVLLE 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-15	PCLUMBER 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	

Study Area: **PG&E Humboldt - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-V-16	SWNS FLT 60kV		C3	L-1/T-1	Not Solved	Not Solved	>0.9	
HUMB-SP-V-17	ORICK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (LP_FLKBD-JANS CR) & Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA)	C3	L-1-1	0.88	0.86	0.82	Adjust Blue Lake generation
HUMB-SP-V-18	ARCATA 60kV		C3	L-1-1	>0.9	0.90	0.86	
HUMB-SP-V-19	SIMPSON 60kV		C3	L-1-1	0.89	0.87	0.83	
HUMB-SP-V-20	BCHIPMIL 60kV		C3	L-1-1	0.89	0.88	0.83	
HUMB-SP-V-21	BIG_LAGN 60kV		C3	L-1-1	0.88	0.86	0.82	
HUMB-SP-V-22	BLUE LKE 60kV		C3	L-1-1	0.89	0.87	0.83	
HUMB-SP-V-23	BLUELKPP 60kV		C3	L-1-1	0.89	0.87	0.83	
HUMB-SP-V-24	JANS CRK 60kV		C3	L-1-1	0.89	0.88	0.84	
HUMB-SP-V-25	TRINIDAD 60kV		C3	L-1-1	0.88	0.86	0.82	
HUMB-SP-V-26	NEWBURG 60kV	Humboldt Bay - Rio Dell Jct 60kV line & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	0.89	>0.9	>0.9	Bridgeville - Garberville 115kV line
HUMB-SP-V-27	FRT SWRD 60kV		C3	L-1/T-1	0.81	0.89	>0.9	
HUMB-SP-V-28	KEKAWAKA 60kV		C3	L-1/T-1	0.81	0.89	>0.9	
HUMB-SP-V-29	SWNS FLT 60kV		C3	L-1/T-1	0.86	0.93	>0.9	
HUMB-SP-V-30	ORICK 60kV		C5	L-2	0.88	0.86	0.82	

Study Area: **PG&E Humboldt - Summer Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Peak	2018 Summer Peak	2023 Summer Peak	
HUMB-SP-V-31	ARCATA 60kV	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	0.91	0.90	0.86	Adjust Blue Lake generation
HUMB-SP-V-32	SIMPSON 60kV		C5	L-2	0.89	0.87	0.83	
HUMB-SP-V-33	BCHIPMIL 60kV		C5	L-2	0.89	0.87	0.83	
HUMB-SP-V-34	BIG_LAGN 60kV		C5	L-2	0.88	0.86	0.82	
HUMB-SP-V-35	BLUE LKE 60kV		C5	L-2	0.89	0.87	0.83	
HUMB-SP-V-36	BLUELKPP 60kV		C5	L-2	0.89	0.87	0.83	
HUMB-SP-V-37	JANS CRK 60kV		C5	L-2	0.89	0.87	0.84	
HUMB-SP-V-38	TRINIDAD 60kV		C5	L-2	0.88	0.86	0.82	

Study Area: **PG&E Humboldt - Winter Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-V-1	COVELO6 60kV	BUS FAULT AT Bridgeville 60kV bus	C1	Bus	>0.9	Not Solved	>0.9	Case Not Solved. Open CB 32 at Garberville to open the Bridgeville - Garberville 60kV line at Garberville.
HUMB-WP-V-2	FRT SWRD 60kV		C1	Bus	>0.9	Not Solved	>0.9	
HUMB-WP-V-3	FRUITLND 60kV		C1	Bus	>0.9	Not Solved	>0.9	
HUMB-WP-V-4	GRBRVLLE 60kV		C1	Bus	>0.9	Not Solved	>0.9	
HUMB-WP-V-5	KEKAWAKA 60kV		C1	Bus	>0.9	Not Solved	>0.9	
HUMB-WP-V-6	LYTNVLLE 60kV		C1	Bus	>0.9	Not Solved	>0.9	
HUMB-WP-V-7	COVELO6 60kV	Rio Dell Tap 60 kV Line(SCOTIATP-RIODLLTP) & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	>0.9	Not Solved	>0.9	2018 case not solved. Bridgeville - Garberville 115kV line Project. In the interim drop load at Garberville.
HUMB-WP-V-8	BRDGVLLE 60kV		C3	L-1/T-1	0.89	Not Solved	>0.9	
HUMB-WP-V-9	CARLOTTA 60kV		C3	L-1/T-1	0.88	Not Solved	>0.9	
HUMB-WP-V-10	FRT SWRD 60kV		C3	L-1/T-1	0.91	Not Solved	>0.9	
HUMB-WP-V-11	FRUITLND 60kV		C3	L-1/T-1	0.90	Not Solved	>0.9	
HUMB-WP-V-12	GRBRVLLE 60kV		C3	L-1/T-1	0.93	Not Solved	>0.9	
HUMB-WP-V-13	KEKAWAKA 60kV		C3	L-1/T-1	0.93	Not Solved	>0.9	
HUMB-WP-V-14	LYTNVLLE 60kV		C3	L-1/T-1	>0.9	Not Solved	>0.9	
HUMB-WP-V-15	PCLUMBER 60kV		C3	L-1/T-1	0.88	Not Solved	>0.9	
HUMB-WP-V-16	SWNS FLT 60kV		C3	L-1/T-1	0.89	Not Solved	>0.9	

Study Area: **PG&E Humboldt - Winter Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-V-17	ORICK 60kV	Essex Jct - Arcata - Fairhaven 60 kV Line (LP_FLKBD-JANS CR) & Essex Jct - Arcata - Fairhaven 60 kV Line (ARC_JT2X-ARCATA)	C3	L-1-1	>0.9	0.87	0.84	Adjust Blue Lake generation
HUMB-WP-V-18	ARCATA 60kV		C3	L-1-1	>0.9	0.90	0.88	
HUMB-WP-V-19	SIMPSON 60kV		C3	L-1-1	>0.9	0.88	0.85	
HUMB-WP-V-20	BCHIPMIL 60kV		C3	L-1-1	>0.9	0.88	0.86	
HUMB-WP-V-21	BCHIPMIL 60kV		C3	L-1-1	>0.9	0.88	0.86	
HUMB-WP-V-22	BIG_LAGN 60kV		C3	L-1-1	>0.9	0.87	0.84	
HUMB-WP-V-23	BLUE LKE 60kV		C3	L-1-1	>0.9	0.88	0.85	
HUMB-WP-V-24	BLUELKPP 60kV		C3	L-1-1	>0.9	0.88	0.85	
HUMB-WP-V-25	JANS CRK 60kV		C3	L-1-1	>0.9	0.88	0.85	
HUMB-WP-V-26	TRINIDAD 60kV		C3	L-1-1	>0.9	0.87	0.84	
HUMB-WP-V-27	ORICK 60kV	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	C5	L-2	>0.9	0.87	0.84	Adjust Blue Lake generation
HUMB-WP-V-28	ARCATA 60kV		C5	L-2	>0.9	>0.9	0.88	
HUMB-WP-V-29	SIMPSON 60kV		C5	L-2	>0.9	0.88	0.85	
HUMB-WP-V-30	BCHIPMIL 60kV		C5	L-2	>0.9	0.88	0.86	
HUMB-WP-V-31	BIG_LAGN 60kV		C5	L-2	>0.9	0.87	0.84	
HUMB-WP-V-32	BLUE LKE 60kV		C5	L-2	>0.9	0.88	0.85	

Study Area: **PG&E Humboldt - Winter Peak**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Winter Peak	2018 Winter Peak	2023 Winter Peak	
HUMB-WP-V-33	JANS CRK 60kV		C5	L-2	>0.9	0.88	0.85	
HUMB-WP-V-34	TRINIDAD 60kV		C5	L-2	>0.9	0.87	0.84	

Study Area: **PG&E Humboldt - Summer Off-Peak & Summer Light Load**

High/Low Voltage

ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)			Potential Mitigation Solutions
					2015 Summer Off-Peak	2018 Summer Light Load	N/A	
HUMB-NP-V-1	COVELO6 60kV	Humboldt Bay - Rio Dell Jct 60kV line & Bridgeville 115/60 kV Transformer	C3	L-1/T-1	Not Solved	>0.9		Case does not solve. Bridgeville - Garberville 115kV line will mitigate the issue. In the interim drop load at Rio Dell, Carlotta, Bridgeville, Fruitland, Fortseward, Garberville depending on the need.
HUMB-NP-V-2	NEWBURG 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-3	BRDGVLLE 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-4	CARLOTTA 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-5	FRT SWRD 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-6	FRUITLND 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-7	GRBRVLLE 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-8	KEKAWAKA 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-9	LYTNVLLE 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-10	PCLUMBER 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-11	RIO DELL 60kV		C3	L-1/T-1	Not Solved	>0.9		
HUMB-NP-V-12	SWNS FLT 60kV		C3	L-1/T-1	Not Solved	>0.9		

Study Area: **PG&E Humboldt - Summer Peak**

Single Contingency Load Drop

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

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

Study Area: **PG&E Humboldt - Winter Peak**

Single Contingency Load Drop

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

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

Study Area: **PG&E Humboldt - Summer Off-Peak & Summer Light Load**

Single Contingency Load Drop

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

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

Study Area: **PG&E Humboldt - Winter Peak**

Single Source Substation with more than 100 MW Load

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

No single source substation with more than 100 MW Load

Study Area: **PG&E Humboldt - Summer Peak**

Single Source Substation with more than 100 MW Load

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

No single source substation with more than 100 MW Load

Study Area: **PG&E Humboldt - Summer Off-Peak & Summer Light Load**

Single Source Substation with more than 100 MW Load

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

No single source substation with more than 100 MW Load