

Study Area: PG&E Humboldt

Thermal Overloads



ID	Overloaded Facility	Worst Contingency	Category	Category Description	Loading (%)										Potential Mitigation Solutions
					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Spring Off-Peak	2021 Summer Light Load	N/A	N/A	
HUMB-T-01	HUMBOLDT-BRDGVILLE 115 kV # 1 1	P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820] &	P1-2	T-line	<100	<100	100.08	<100	<100	<100	<100	99.78			Monitor line loading due to long lead time (Humboldt-Bridgeville 115 kV Line overload)
HUMB-T-02	HUMBOLDT-HMBLT JT 60 kV 1 1	P1-2:A1:13:_HUMBOLDT BAY-HUMBOLDT #2 60kV [7090] &	P1-2	T-line	99.19	<100	108.91	<100	<100	<100	106.95	110.3			Redispatch Humboldt Bay generation (Humboldt Bay-Humboldt #1 60 kV Line overload)
HUMB-T-03	HMBLT BY-EEL RIVR 60 kV 1 1	P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810] &	P1-2	T-line	<100	<100	112.83	<100	<100	103.17	<100	99.99			Redispatch Humbolt Bay generation (Humboldt Bay-Rio Dell Jct 60 kV Line)
HUMB-T-04	CARLOTTA-RIODLLTP 60 kV 1 1	P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810] &	P1-2	T-line	98.09	99.36	121.94	<100	<100	<100	103.79	118.62			Existing action Plan (Rio Dell Jct Jct-Bridgeville 60 kV Line overload). Gen redispatch/reduce gen at Humboldt Bay
HUMB-T-05	CARLOTTA-SWNS FLT 60 kV 1 1	P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810] &	P1-2	T-line	<100	96.19	118.72	<100	<100	<100	100.93	115.57			Existing action Plan (Rio Dell Jct Jct-Bridgeville 60 kV Line overload). Gen redispatch/reduce gen at Humboldt Bay
HUMB-T-06	SWNS FLT-BRDGVILLE 60 kV 1 1	P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810] &	P1-2	T-line	<100	<100	118.31	<100	<100	<100	100.55	115.18			Existing action Plan (Rio Dell Jct Jct-Bridgeville 60 kV Line overload). Gen redispatch/reduce gen at Humboldt Bay
HUMB-T-07	FRUTLDJT-FTSWRDJT 60 kV 1 1	P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110] &	P1-2	T-line	100.48	99.86	<100	<100	<100	<100	<100	<100			Existing Action Plan (Bridgeville-Garberville 60 KV Line). Gen redispatch: Reduce gen at Humboldt Bay
HUMB-T-08	HUMBOLDT-BRDGVILLE 115 kV 1 1	P2-1:A1:1:_HUMBOLDT-TRINITY 115kV [1820] (HUMBOLDT-TRINITY) &	P2-1	Open-ended line	72.76	76.73	100.08	72.53	72.71	87.14	81.68	99.78			Monitor line loading due to long lead time. (Humboldt-Bridgeville 115 kV Line)
HUMB-T-09	CARLOTTA-RIODLLTP 60 kV 1 1	P2-2:A1:1:_HUMBOLDT 115kV Section MA &	P2-2	Bus	<100	<100	105.78	<100	<100	<100	108.77	116.36			Monitor line loading. Upgrade bus. Interim: Gen redispatch (Rio Dell-Bridgeville 60 kV Line).
HUMB-T-10	CARLOTTA-SWNS FLT 60 kV 1 1	P2-2:A1:1:_HUMBOLDT 115kV Section MA &	P2-2	Bus	74.86	63.61	102.62	<100	<100	<100	105.92	113.35			Monitor line loading. Upgrade bus. Interim: Gen redispatch (Rio Dell-Bridgeville 60 kV Line).

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					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Spring Off-Peak	2021 Summer Light Load	N/A	N/A	
HUMB-T-11	SWNS FLT-BRDGVLE 60 kV 1 1	P2-2:A1:1:_HUMBOLDT 115kV Section MA &	P2-2	Bus	74.47	63.24	102.23	<100	<100	<100	105.54	112.95			Monitor line loading. Upgrade bus. Interim: Gen redispatch (Rio Dell-Bridgeville 60 kV Line).
HUMB-T-12	FRUTLDJT-FTSWRDJT 60 kV 1 1	P2-2:A1:3:_LOW GAP1 115kV Section 1D &	P2-2	Bus	100.48	99.87	22.61	<100	<100	<100	86.01	79.69			Approved Bridgeville-Gabreville 115 kV Line project (Bridgeville-Garberville 60 kV Line)
HUMB-T-13	HUMBOLDT-HMBLT JT 60 kV 1 1	P2-3:A1:13:_HMBLT BY 60kV - Middle Breaker Bay 3 &	P2-3	Circuit breaker	110.51	89.54	117.69	<100	<100	<100	110.43	114.77			Interim: Gen redispatch at Humboldt Bay. Upgrade and increase capacity of the approved Humboldt Bay-Humboldt #1 60 kV reconductor project (Humboldt Bay-Humboldt #1 60 kV Line)
HUMB-T-14	HMBLT BY-EEL RIVR 60 kV 1 1	P2-3:A1:21:_BRDGVLE 115kV - Ring R1 & R3 &	P2-3	Circuit breaker	85.09	81.85	<100	86.78	87.84	89.68	<100	<100			Interim: Gen redispatch. Monitor line loading due to long lead time (Humboldt Bay-Rio Dell Jct 60 kV Line)
HUMB-T-15	HMBLT BY-EEL RIVR 60 kV 1 1	P1-1:A1:2:_PAC.LUMB 14kV Gen Unit 1 or 2 & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P3	L-/G-1	99.35	98.6	99.19	99.89	99.98	99.68	<100	100.38			Gen redispatch at Humboldt Bay (Humboldt Bay-Rio Dell Jct 60 kV Line)
HUMB-T-16	CARLOTTA-RIODLLTP 60 kV 1 1	P1-1:A1:10:_HUMB_G2 14kV Gen Unit 5 or 3 & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P3	L-/G-1	<100	<100	100.04	<100	<100	<100	<100	100.69			Monitor. Gen redispatch at Humboldt Bay (Rio Dell Jct-Bridgeville 60 kV Line overload)
HUMB-T-17	HMBLT BY-EEL RIVR 60 kV 1 1	P1-1:A1:2:_PAC.LUMB 14kV Gen Unit 1 & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P3	L-/G-1	99.35	98.6	99.19	101.44	102.65	112.88	95.29	100.38			Reconductor. Interim: Gen Redispatch (Humboldt Bay-Rio Dell Jct 60 kV Line overload)
HUMB-T-18	EUREKA-HMBLT BY 60 kV 1 1	P1-2:A1:13:_HUMBOLDT BAY-HUMBOLDT #2 60kV [7090] & P1-2:A1:12:_HUMBOLDT BAY-HUMBOLDT #1 60kV [7080]	P6	N-1-1	102.16	100.95	102.16	129.19	122.34	138.5	102.45	98.61			Action Plan: SPS/redispatch Humboldt Bay generation (Humboldt Bay-Eureka 60 kV Line)
HUMB-T-19	HMBLT BY-EEL RIVR 60 kV 1 1	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60kV [7130] MOAS OPENED on HUMBOLDT_MPLE CRK & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	<100	<100	104.85	102.23	103.37	114.55	<100	<100			SPS/reconductor (Humboldt Bay-Rio Dell Jcte 60 kV Line)
HUMB-T-20	HMBLT BY-EEL RIVR 60 kV 1 1	P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820] & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	<100	<100	<100	150.32	152.1	172.47	<100	<100			SPS/reconductor (Humboldt Bay-Rio Dell Jcte 60 kV Line)

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HUMB-T-21	NEWBURG-RIODLLTP 60 kV 1 1	P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820] & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	<100	<100	<100	<100	<100	107.93	<100	<100			Action Plan: SPS/redispach Humboldt Bay generation (Humboldt Bay-Rio Dell Jcte 60 kV Line)
HUMB-T-22	CARLOTTA-RIODLLTP 60 kV 1 1	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60kV [7130] MOAS OPENED on HUMBOLDT_MPLE CRK & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	100.15	100.31	113.42	122.06	122.52	140.79	101.19	109.14			Existing action Plan (Rio Dell Jct- Bridgeville 60 KV Line overload). Gen redispach/reduce gen at Humboldt Bay
HUMB-T-23	CARLOTTA-SWNS FLT 60 kV 1 1	P1-2:A1:17:_TRINITY-MAPLE CREEK 60kV [8170] MOAS OPENED on TRINITY_TAP 65 & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	95.95	96.95	113.43	118.32	118.97	137.41	97.7	107.63			Existing action Plan (Rio Dell Jct- Bridgeville 60 KV Line overload). Gen redispach/reduce gen at Humboldt Bay
HUMB-T-24	SWNS FLT-BRDGVLLE 60 kV 1 1	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60kV [7130] MOAS OPENED on HUMBOLDT_MPLE CRK & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	96.22	96.76	109.86	116.89	117.6	136.03	97.96	105.77			Existing action Plan (Rio Dell Jct- Bridgeville 60 KV Line overload). Gen redispach/reduce gen at Humboldt Bay
HUMB-T-25	BRDGVLLE-FRUTLDJT 60 kV 1 1	P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110] & P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820]	P6	N-1-1	100.53	100.29	<100	107.51	108.26	<100	99.03	<100			Approved Bridgeville-Gabreville 115 kV project (Bridgeville-Garberville 60 kV Line)
HUMB-T-26	GRBRVLE-KEKAWAKA 60 kV 1 1	P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820] & P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110]	P6	N-1-1	<100	<100	101.08	<100	<100	104.79	<100	<100			Approved Bridgeville-Gabreville 115 kV project (Garberville-Laytonville 60 kV Line overload)
HUMB-T-27	KEKAWAKA-LYTNVLE 60 kV 1 1	P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110] & P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820]	P6	N-1-1	<100	<100	100.97	<100	<100	119.66	<100	<100			Approved Bridgeville-Gabreville 115 kV project (Garberville-Laytonville 60 kV Line overload)
HUMB-T-28	FRUTLDJT-FTSWRDJT 60 kV 1 1	P1-2:A1:25:_BRDGVLLE-GRBRVLE #2 115kV [0] & P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110]	P6	N-1-1	<100	<100	100.43	<100	<100	<100	<100	<100			Approved Bridgeville-Gabreville 115 kV project (Bridgeville-Garberville 60 kV Line)
HUMB-T-29	FRUTLDJT-FTSWRDJT 60 kV 1 1	P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110] & P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820]	P6	N-1-1	101.1	101.19	<100	<100	<100	<100	101.48	<100			Approved Bridgeville-Gabreville 115 kV project (Bridgeville-Garberville 60 kV Line)

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					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Spring Off-Peak	2021 Summer Light Load	N/A	N/A	
HUMB-T-30	FTSWRDJT-GRBRVLE 60 kV 1 1	P1-2:A1:4:_BRIDGEVILLE-COTTONWOOD 115kV [1110] & P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820]	P6	N-1-1	99.1	99.29	<100	<100	<100	<100	99.84	<100			Approved Bridgeville-Gabreville 115 kV project (Bridgeville-Garberville 60 kV Line)
HUMB-T-31	HUMBOLDT-HMBLT JT 60 kV 1 1	P7-1:A1:7:_HUMBOLDT BAY-HUMBOLDT #2 & HUMBOLDT BAY-HUMBOLDT #2 Lines & 32.2	P7	N-2 (DCTL)	105.31	<100	116.12	<100	<100	<100	112.32	119.56			Interim: Gen redispatch at Humboldt Bay. Upgrade and increase capacity of the approved Humboldt Bay-Humboldt #1 60 kV Line reconductor project (Humboldt Bay-Humboldt #1 60 kV Line overload).

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Voltage Deviations



ID	Substation	Worst Contingency	Category	Category Description	Post Cont. Voltage Deviation %										Potential Mitigation Solutions
					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	



ID	Substation	Worst Contingency	Category	Category Description	Voltage (PU)										Potential Mitigation Solutions	
					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A		
HUMB-V-01	FRUITLND 60 kV	P1-2:A1:22:_BRIDGEVILLE-GARBERVILLE 60kV [6220] MOAS OPENED on BRDGVILLE_FRUTLDJT &	P1-2	Gen	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.8933			Monitor	
HUMB-V-02	BRDGVILLE 115 kV	P1-4:A1:6:_HUMBOLDT SVD=v &	P1-4	Transformer	1.1167	1.1003	<1.10	1.123	1.1101	<1.10	1.131	<1.10			Under review	
HUMB-V-03	HUMBOLDT 115 kV	P1-4:A1:6:_HUMBOLDT SVD=v &	P1-4	Transformer	1.1544	1.1393	1.1155	1.158	1.1466	1.107	1.1684	<1.10			Under review	
HUMB-V-04	FRT SWRD 60 kV	P2-1:A1:34:_BRIDGEVILLE-GARBERVILLE 60kV [6220] (BRDGVILLE-FRUTLDJT) &	P2-1	Open-ended line	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.90			Corrective Action Plan	
HUMB-V-05	FRUITLND 60 kV	P2-1:A1:34:_BRIDGEVILLE-GARBERVILLE 60kV [6220] (BRDGVILLE-FRUTLDJT) &	P2-1	Open-ended line	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.893			Corrective Action Plan	
HUMB-V-06	FRT SWRD 60 kV	P2-2:A1:8:_GRBRVILLE 60kV Section 1E &	P2-2	Bus	1.1171	1.1136		1.1199	1.1176	<1.10	1.1361	<1.10			Under review	
HUMB-V-07	BRDGVILLE 115 kV	P2-3:A1:21:_BRDGVILLE 115kV - Ring R1 & R3 &	P2-3	Circuit Breaker	0.8891	0.8915	0.8706	0.889	0.8879	0.8807	0.9121	0.8434			Corrective Action Plan	
HUMB-V-08	FRUITLND 60 kV	P2-3:A1:15:_BRDGVILLE - MA 60kV & RIO DELL JCT-BRIDGEVILLE line &	P2-3	Circuit Breaker	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.8933			Corrective Action Plan	
HUMB-V-09	GRBRVILLE 60 kV	P2-3:A1:19:_BRDGVILLE 115kV - Ring R3 & R2 &	P2-3	Circuit Breaker	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.8959			Corrective Action Plan	
HUMB-V-10	BRDGVILLE 115 kV	P3: P1-1:A1:6:_HUMB_G1 14kV Gen Unit 1 & P1-4:A1:6:_HUMBOLDT SVD=v	P3	L-1/G-1	1.1206	1.1124	<1.10	1.125	1.1175	<1.10	<1.10	<1.10			Under review	
HUMB-V-11	HUMBOLDT 115 kV	P3: P1-1:A1:6:_HUMB_G1 14kV Gen Unit 1 & P1-4:A1:6:_HUMBOLDT SVD=v	P3	L-1/G-1	1.1582	1.1543	1.1232	<1.10	1.1557	1.1159	<1.10	<1.10			Under review	
HUMB-V-12	BRDGVILLE 115 kV	P6: P1-2:A1:3:_HUMBOLDT-TRINITY 115kV [1820] & P1-4:A1:6:_HUMBOLDT SVD=v	P6	N-1-1	1.1245	1.1172	<1.10	<1.10	<1.10	<1.10	1.1425	<1.10			Under review	
HUMB-V-13	BRDGVILLE 115 kV	P6: P1-4:A1:4:_GRBRVILLE SVD=v & P1-4:A1:6:_HUMBOLDT SVD=v	P6	N-1-1	1.1208	1.1084	1.1302	<1.10	<1.10	<1.10	1.143	<1.10			Under review	
HUMB-V-14	FRT SWRD 60 kV	P1-4:A1:4:_GRBRVILLE SVD=v & P1-2:A1:23:_GARBERVILLE-LAYTONVILLE 60kV [8365]	P6	N-1-1	1.1122	1.1136	<1.10	<1.10	<1.10	<1.10	1.1362	<1.10			Under review	



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					2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Winter Peak	2021 Winter Peak	2026 Winter Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A		
HUMB-V-15	FRUITLND 60 kV	P1-2:A1:21:_RIO DELL JCT-BRIDGEVILLE 60kV [7850] MOAS OPENED on CARLOTTA_SWNS FLT & P1-3:A1:3:_BRDGVILLE 115/60kV TB 1	P6	N-1-1	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	>0.90	0.891			Corrective Action Plan	
HUMB-V-16	FRUITLND 60 kV	P1-2:A1:22:_BRIDGEVILLE-GARBERVILLE 60kV [6220] MOAS OPENED on BRDGVILLE_FRUTLDJT & P1-4:A1:4:_GRBRVILLE SVD=v	P6	N-1-1	1.0751	1.0781	1.0781	<1.10	<1.10	<1.10	1.1899	<1.10			Under review	
HUMB-V-17	GRBRVILLE 60 kV	P1-2:A1:24:_BRIDGEVILLE-GARBERVILLE 60kV [6220] MOAS OPENED on FTSWRDJT_GRBRVILLE & P1-4:A1:4:_GRBRVILLE SVD=v	P6	N-1-1	1.1933	1.1992	1.0941	<1.10	<1.10	<1.10	1.262	<1.10			Under review	
HUMB-V-18	GRBRVILLE 60 kV	P1-4:A1:4:_GRBRVILLE SVD=v & P1-4:A1:6:_HUMBOLDT SVD=v	P6	N-1-1	<1.10	<1.10	1.145	<1.10	<1.10	<1.10	1.1235	<1.10			Monitor	
HUMB-V-19	HOOPA 60 kV	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60kV [7130] MOAS OPENED on HUMBOLDT_MPLE CRK & P1-4:A1:7:_MPLE CRK SVD=v	P6	N-1-1	0.8331	0.829	0.8297	>0.90	>0.90	>0.90	0.9184	0.9274			Corrective Action Plan	
HUMB-V-20	HUMBOLDT 115 kV	P1-4:A1:6:_HUMBOLDT SVD=v & P1-2:A1:2:_HUMBOLDT-BRIDGEVILLE 115kV [1810]	P6	N-1-1	1.1795	1.1774	1.1806	<1.10	1.1768	1.1779	1.1861	<1.10			Under review	
HUMB-V-21	MPLE CRK 60 kV	P1-2:A1:14:_HUMBOLDT-MAPLE CREEK 60kV [7130] MOAS OPENED on HUMBOLDT_MPLE CRK & P1-4:A1:1:_HUMBOLDT SHUNT=7h	P6	N-1-1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10			Monitor	

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Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance - Number of Voltage and Frequency Violations										Potential Mitigation Solutions
				2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	N/A	N/A	N/A	
HUMB-TS-01	HUMBOLDT 115.00	P2-2	Bus			4								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-02	HUMBOLDT 115.00	P2-2	Bus				6							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-03	HUMBOLDT 115.00	P2-2	Bus		4									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-04	HUMBOLDT 115.00	P2-2	Bus					7						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-05	HUMBOLDT 115.00	P2-2	Bus	6										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-06	Bridgeville - Garberville 60 kV Line (BRDGVLLE-FRUTLDJT)	P1-2	T-line		12									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-07	Bridgeville - Garberville 60 kV Line (BRDGVLLE-FRUTLDJT)	P1-2	T-line					8						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-08	Bridgeville - Garberville 60 kV Line (BRDGVLLE-FRUTLDJT)	P1-2	T-line				8							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-09	Bridgeville - Garberville 60 kV Line (BRDGVLLE-FRUTLDJT)	P1-2	T-line			12								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-10	Bridgeville - Garberville 60 kV Line (BRDGVLLE-FRUTLDJT)	P1-2	T-line	14										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-11	Humboldt 115/60 No.2 Transformer	P1-3	Transformer		1									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-12	Humboldt 115/60 No.2 Transformer	P1-3	Transformer			0								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-13	Humboldt 115/60 No.2 Transformer	P1-3	Transformer				2							Reassess with actual fault clearing times and SLG fault impedances where applicable

Study Area: PG&E Humboldt

Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance - Number of Voltage and Frequency Violations										Potential Mitigation Solutions
				2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	N/A	N/A	N/A	
HUMB-TS-14	Humboldt 115/60 No.2 Transformer	P1-3	Transformer	0										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-15	Humboldt 115/60 No.2 Transformer	P1-3	Transformer					17						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-16	HUMBOLDT 60.00 SVD ID v	P1-4	Shunt device		0									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-17	HUMBOLDT 60.00 SVD ID v	P1-4	Shunt device	1										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-18	HUMBOLDT 60.00 SVD ID v	P1-4	Shunt device				2							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-19	HUMBOLDT 60.00 SVD ID v	P1-4	Shunt device			3								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-20	HUMBOLDT 60.00 SVD ID v	P1-4	Shunt device					17						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-21	NON-BUS-TIE BREAKER CB6622 FAULT AT 31080 HUMBOLDT 60.00	P2-3	Circuit breaker		11									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-22	NON-BUS-TIE BREAKER CB6622 FAULT AT 31080 HUMBOLDT 60.00	P2-3	Circuit breaker			11								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-23	NON-BUS-TIE BREAKER CB6622 FAULT AT 31080 HUMBOLDT 60.00	P2-3	Circuit breaker					29						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-24	NON-BUS-TIE BREAKER CB6622 FAULT AT 31080 HUMBOLDT 60.00	P2-3	Circuit breaker				11							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-25	NON-BUS-TIE BREAKER CB6622 FAULT AT 31080 HUMBOLDT 60.00	P2-3	Circuit breaker	13										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-26	BUS-TIE BREAKER FAULT AT 31000 HUMBOLDT 115.00	P2-4	Bus tie-breaker			4								Reassess with actual fault clearing times and SLG fault impedances where applicable

Study Area: PG&E Humboldt

Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance - Number of Voltage and Frequency Violations										Potential Mitigation Solutions
				2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	N/A	N/A	N/A	
HUMB-TS-27	BUS-TIE BREAKER FAULT AT 31000 HUMBOLDT 115.00	P2-4	Bus tie-breaker	6										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-28	BUS-TIE BREAKER FAULT AT 31000 HUMBOLDT 115.00	P2-4	Bus tie-breaker					7						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-29	BUS-TIE BREAKER FAULT AT 31000 HUMBOLDT 115.00	P2-4	Bus tie-breaker		4									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-30	BUS-TIE BREAKER FAULT AT 31000 HUMBOLDT 115.00	P2-4	Bus tie-breaker				6							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-31	FAIRHAVN 13.80	P4-1	Stuck breaker			6								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-32	FAIRHAVN 13.80	P4-1	Stuck breaker					8						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-33	FAIRHAVN 13.80	P4-1	Stuck breaker				8							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-34	FAIRHAVN 13.80	P4-1	Stuck breaker		6									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-35	FAIRHAVN 13.80	P4-1	Stuck breaker	8										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-36	Bridgeville - Garberville 60 kV Line (31110 - 31120)	P4-2	T-line/stuck breaker			12								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-37	Bridgeville - Garberville 60 kV Line (31110 - 31120)	P4-2	T-line/stuck breaker				14							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-38	Bridgeville - Garberville 60 kV Line (31110 - 31120)	P4-2	T-line/stuck breaker					38						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-39	Bridgeville - Garberville 60 kV Line (31110 - 31120)	P4-2	T-line/stuck breaker	14										Reassess with actual fault clearing times and SLG fault impedances where applicable

Study Area: PG&E Humboldt

Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance - Number of Voltage and Frequency Violations										Potential Mitigation Solutions
				2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	N/A	N/A	N/A	
HUMB-TS-40	Humboldt 115/60 No.2 Transformer (31000)	P4-3	Transformer/stuck breaker					100						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-41	Humboldt 115/60 No.2 Transformer (31000)	P4-3	Transformer/stuck breaker			140								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-42	Humboldt 115/60 No.2 Transformer (31000)	P4-3	Transformer/stuck breaker		148									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-43	Humboldt 115/60 No.2 Transformer (31000)	P4-3	Transformer/stuck breaker	143										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-44	Humboldt 115/60 No.2 Transformer (31000)	P4-3	Transformer/stuck breaker				101							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-45	Humboldt	P5-1	generator/relay failure					105						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-46	Humboldt	P5-1	generator/relay failure				101							Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-47	Humboldt	P5-1	generator/relay failure			138								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-48	Humboldt	P5-1	generator/relay failure	153										Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-49	Humboldt	P5-1	generator/relay failure		148									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-50	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	P7-1	Two circuits/common structure			6								Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-51	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	P7-1	Two circuits/common structure	8										Reassess with actual fault clearing times and SLG fault impedances where applicable

Study Area: **PG&E Humboldt**

Transient Stability



ID	Contingency	Category	Category Description	Transient Stability Performance - Number of Voltage and Frequency Violations										Potential Mitigation Solutions
				2018 Summer Peak	2021 Summer Peak	2026 Summer Peak	2018 Summer Off-Peak	2021 Summer Light Load	N/A	N/A	N/A	N/A	N/A	
HUMB-TS-52	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	P7-1	Two circuits/comm on structure	8				15						Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-53	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	P7-1	Two circuits/comm on structure		6									Reassess with actual fault clearing times and SLG fault impedances where applicable
HUMB-TS-54	Humboldt No.1 60 kV and Arcata - Humboldt 60 kV Lines	P7-1	Two circuits/comm on structure				15							Reassess with actual fault clearing times and SLG fault impedances where applicable

Study Area: PG&E Humboldt



Single Contingency Load Drop

ID	Worst Contingency	Category	Category Description	Amount of Load Drop (MW)										Potential Mitigation Solutions
				Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SLD-1														

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

ID	Substation	Load Served (MW)										Potential Mitigation Solutions
		Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	Select..	
X-SS-1												

No single source substation with more than 100 MW Load