

Study Area: PG&E North Coast & North Bay

Thermal Overloads



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)								Loading % (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
30435 LAKEVILLE 230 30460 VACA-DIX 230 1	LAKEVILLE 230kV - Section 2E & 2D	P2	P2-4	<100	<100	108	<100	<100	<100	<100	<100	<100	<100	<100	108	Continue to monitor future load forecast
	TULUCAY-VACA 230kV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230kV	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	<100	102	Continue to monitor future load forecast
30440 TULUCAY 230 30460 VACA-DIX 230 1	GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	Continue to monitor future load forecast
	IGNACIO-SOBRANTE 230kV & VACA-LAKEVILLE #1 230kV	P6	N-1-1	<100	<100	106	<100	<100	<100	<100	<100	<100	<100	<100	106	Continue to monitor future load forecast
	LAKEVILLE 230kV - Section 2E & 1E	P2	P2-4	<100	100	114	<100	<100	<100	<100	<100	103	<100	<100	114	Continue to monitor future load forecast
	VACA-LAKEVILLE #1 230kV & GEYSR18-LAKEVILLE-GEYSR20-GEYSR13 230kV	P6	N-1-1	<100	101	<100	<100	<100	<100	<100	<100	104	<100	<100	<100	System upgrade, operating solution or SPS
31200 MENDOCNO 115 31217 LUCERNJ2 115 1	CORTINA-MENDOCINO #1 115kV & GEYSERS #3-CLOVERDALE 115kV	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	<100	102	Continue to monitor future load forecast
31200 MENDOCNO 115 31260 MNDCNO M 115 1	UKIAH-HOPLAND-CLOVERDALE 115kV & MENDOCINO-REDBUD 115kV	P6	N-1-1	<100	<100	<100	<100	<100	<100	103	<100	<100	113	<100	<100	Generation redispatch
31224 INDIN VL 115 31215 LUCERNJ1 115 1	EGLERCK - MA 115kV & EAGLE ROCK-CORTINA line	P2	P2-3	<100	<100	<100	<100	100	101	<100	<100	<100	<100	<100	<100	Continue to monitor future load forecast
31225 HIGHLNDJ1 115 31262 CACHE J2 115 1	CORTINA-MENDOCINO #1 115kV & GEYSERS #3-CLOVERDALE 115kV	P6	N-1-1	<100	<100	107	<100	<100	<100	<100	<100	102	<100	<100	107	Continue to monitor future load forecast
31229 REDBUDJ2 115 31222 REDBUD 115 1	CORTINA-MENDOCINO #1 115kV & GEYSERS #3-CLOVERDALE 115kV	P6	N-1-1	<100	<100	107	<100	<100	<100	<100	<100	102	<100	<100	107	Continue to monitor future load forecast
31236 FULTON 115 31238 MONROE1 115 1	FULTON-SANTA ROSA #2 115kV & CORONA-LAKEVILLE 115kV	P6	N-1-1	120	122	135	111	114	126	<100	<100	126	<100	101	135	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31236 FULTON 115 31239 MONROE2 115 1	FULTON-SANTA ROSA #1 115kV & CORONA-LAKEVILLE 115kV	P6	N-1-1	120	122	134	111	114	125	<100	<100	126	<100	101	134	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31238 MONROE1 115 31240 SNTA RSA 115 1	FULTON-SANTA ROSA #2 115kV & CORONA-LAKEVILLE 115kV	P6	N-1-1	108	109	123	<100	100	112	<100	<100	112	<100	<100	123	System upgrade, operating solution or SPS
31239 MONROE2 115 31240 SNTA RSA 115 1	FULTON-SANTA ROSA #1 115kV & CORONA-LAKEVILLE 115kV	P6	N-1-1	<100	101	110	<100	<100	103	<100	<100	105	<100	<100	110	System upgrade, operating solution or SPS
31240 SNTA RSA 115 31242 STNY PTP 115 1	FULTON 115kV - Section 2D & 1D	P2	P2-4	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100	100	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100	100	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31242 STNY PTP 115 31246 BELLVUE 115 1	FULTON 115kV - Section 2D & 1D	P2	P2-4	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 115kV & FULTON-SANTA ROSA #2 115kV	P6	N-1-1	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	<100	102	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON 115kV - Section 2D & 1D	P2	P2-4	115	117	131	107	110	124	<100	<100	121	<100	<100	131	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan



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				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
31246 BELLVUE 115 31248 PENNGRVE 115 1	FULTON 230 kV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	118	<100	<100	101	<100	<100	<100	<100	<100	<100	<100	<100	operating solutions for short-term
	FULTON 230/115kV TB 9 & FULTON 230/115kV TB 4	P6	N-1-1	116	107	120	<100	<100	111	<100	<100	111	<100	<100	120	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	115	116	131	107	110	124	<100	<100	120	<100	<100	131	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31248 PENNGRVE 115 31254 CORONA 115 1	FULTON 115kV - Section 2D & 1D	P2	P2-4	118	121	136	110	113	129	<100	<100	125	<100	<100	136	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON 230 kV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	122	<100	<100	104	<100	<100	<100	<100	<100	<100	<100	<100	operating solutions for short-term
	FULTON 230/115kV TB 9 & FULTON 230/115kV TB 4	P6	N-1-1	119	111	126	102	103	116	<100	<100	115	<100	<100	126	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	118	120	137	110	113	129	<100	<100	124	<100	<100	137	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31254 CORONA 115 31255 LAKEVILLE 115 1	FULTON 115kV - Section 2D & 1D	P2	P2-4	111	113	126	115	118	134	<100	<100	117	<100	<100	126	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON 230 kV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	114	<100	<100	109	<100	<100	<100	<100	<100	<100	<100	<100	operating solutions for short-term
	FULTON 230/115kV TB 9 & FULTON 230/115kV TB 4	P6	N-1-1	112	104	117	107	108	122	<100	<100	108	<100	<100	117	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	110	112	127	114	117	134	<100	<100	116	<100	<100	127	Project: RAS Identified in 2018-2019 TPP In-service date: TBD Short term: Action plan
31258 SONOMA 115 32564 PUEBLO 115 1	FULTON 230 kV BAAH BUS #1 (FAILURE OF NON-REDUNDENT RELAY)	P5	Non-Redundent Relay	107	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	operating solutions for short-term
	FULTON 230/115kV TB 9 & FULTON 230/115kV TB 4	P6	N-1-1	105	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	System upgrade, operating solution or SPS
31262 CACHE J2 115 31229 REDBUDJ2 115 1	CORTINA-MENDOCINO #1 115kV & GEYSERS #3-CLOVERDALE 115kV	P6	N-1-1	<100	<100	107	<100	<100	<100	<100	<100	102	<100	<100	107	Continue to monitor future load forecast
31300 MENDOCNO 60.0 31330 UPPR LKE 60.0 1	EGLE RCK 115/60kV TB 1	P1	N-1	<100	<100	<100	<100	<100	<100	<100	<100	102	<100	<100	<100	Sensitivity only
31300 MENDOCNO 60.0 31330 UPPR LKE 60.0 1	KONOCTI-EAGLE ROCK 60kV	P1	N-1	<100	<100	<100	<100	<100	<100	<100	<100	102	<100	<100	<100	Sensitivity only
31334 CLEAR LAKE 60.0 31335 GRANITE 60.0 1	EGLE RCK 115/60kV TB 1	P1	N-1	102	<100	<100	<100	<100	<100	<100	<100	<100	<100	108	<100	Project: Clear Lake 60kV System Reinforcement In-service date: 2/22 Short-term: Action plan



Overloaded Facility	Contingency (All and Worst P6)	Category	Category Description	Loading % (Baseline Scenarios)								Loading % (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
31334 CLEAR LAKE 60.0 31335 GRANITE 60.0 1	KONOCTI-EAGLE ROCK 60kV	P1	N-1	102	<100	<100	<100	<100	<100	<100	<100	<100	<100	108	<100	Project: Clear Lake 60kV System Reinforcement In-service date: 2/22 Short-term: Action plan
31335 GRANITE 60.0 31336 HPLND JT 60.0 1	EGLERCK 115/60kV TB 1	P1	N-1	105	<100	<100	<100	<100	<100	<100	<100	<100	<100	112	<100	Project: Clear Lake 60kV System Reinforcement In-service date: 2/22 Short-term: Action plan
	KONOCTI-EAGLE ROCK 60kV	P1	N-1	105	<100	<100	<100	<100	<100	<100	<100	<100	<100	112	<100	Project: Clear Lake 60kV System Reinforcement In-service date: 2/22 Short-term: Action plan
31336 HPLND JT 60.0 31206 HPLND JT 115 2	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	Bus Upgrade
31336 HPLND JT 60.0 31370 CLVRDLJT 60.0 1	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	245	231	166	167	159	206	<100	248	<100	240	231	Bus Upgrade
	FULTON 230/115kV TB 9 & EGLERCK-FULTON-SILVERDO 115kV	P6	N-1-1	112	100	112	<100	<100	<100	<100	<100	103	<100	<100	112	System upgrade, operating solution or SPS
	GEYSERS #17-FULTON & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	<100	<100	104	<100	<100	<100	<100	<100	<100	<100	<100	104	Continue to monitor future load forecast
	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	101	106	114	<100	<100	<100	<100	<100	106	<100	103	114	System upgrade, operating solution or SPS
31370 CLVRDLJT 60.0 31374 GYSRJCT1 60.0 1	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	244	231	167	167	159	205	<100	248	<100	240	231	Bus Upgrade
	FULTON 230/115kV TB 9 & EGLERCK-FULTON-SILVERDO 115kV	P6	N-1-1	112	<100	<100	<100	<100	<100	<100	<100	103	<100	<100	<100	System upgrade, operating solution or SPS
	GEYSERS #17-FULTON & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	<100	<100	103	<100	<100	<100	<100	<100	<100	<100	<100	103	Continue to monitor future load forecast
	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	100	106	113	<100	<100	<100	<100	<100	106	<100	103	113	System upgrade, operating solution or SPS
31374 GYSRJCT1 60.0 31382 FTCHMTNP 60.0 1	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	220	209	169	169	160	183	68	223	55	216	209	Bus Upgrade
	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	<100	<100	101	<100	<100	<100	<100	<100	<100	<100	<100	101	Continue to monitor future load forecast
31377 FCHMNTP2 60.0 31380 FTCH MTN 60.0 1	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	163	160	124	126	124	129	<100	164	<100	138	160	Bus Upgrade
	FULTON-WINDSOR #1 60kV	P1	N-1	176	181	185	107	110	116	<100	<100	183	<100	<100	185	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON-WINDSOR #1 60kV & EGLERCK-FULTON-SILVERDO 115kV	P6	N-1-1	178	183	188	<100	<100	<100	<100	<100	185	<100	<100	188	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment



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				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
	WINDSOR 60kV Section 1D	P2	P2-2	<100	101	104	<100	<100	<100	<100	<100	103	<100	<100	104	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	WINDSOR-FCHMNTP2 60kV 0 No Fault	P2	P2-1	<100	102	104	<100	<100	<100	<100	<100	103	<100	<100	104	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	Base Case	P0		116	120	122	<100	<100	<100	<100	<100	122	<100	<100	122	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FITCH MTN #1 TAP 60kV (FTCH MTN-HDSBGTP1)	P2	P2-1	103	107	108	<100	<100	<100	<100	<100	109	<100	<100	108	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FITCH MTN #2 TAP 60kV (FCHMNTP2-FTCH MTN)	P2	P2-1	103	106	107	<100	<100	<100	<100	<100	108	<100	<100	107	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON - HOPLAND 60 kV & GEYSER 12 - FULTON & GEYSER 17 - FULTON 230 kV LINES	P7	DCTL	104	108	115	<100	<100	<100	<100	<100	110	<100	<100	115	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON 115/60kV TB 1 & FULTON 115/60kV TB 2	P6	N-1-1	<100	111	113	<100	<100	<100	<100	<100	112	<100	<100	113	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment



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31379 HDSBGTP2 60.0 31377 FCHMNTP2 60.0 1	FULTON 115kV - Section 2F & 1F	P2	P2-4	NConv	111	113	<100	<100	<100	<100	<100	112	<100	<100	113	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON-HOPLAND 60kV	P1	N-1	103	107	108	<100	<100	<100	<100	<100	109	<100	<100	108	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON-HOPLAND 60kV & GEYSERS #17-FULTON 230kV & EAGLE ROCK-FULTON-SILVERADO 115kV LINES	P7	DCTL	104	108	110	<100	<100	<100	<100	<100	109	<100	<100	110	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON-HOPLAND 60kV (FULTON-FCHMTNP)	P2	P2-1	103	106	109	<100	<100	<100	<100	<100	108	<100	<100	109	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	FULTON-WINDSOR #1 60kV	P1	N-1	104	108	111	<100	<100	<100	<100	<100	110	<100	<100	111	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	GEYSER 12 - FULTON& GEYSER 17 - FULTON 230 kV LINES	P7	DCTL	101	104	110	<100	<100	<100	<100	<100	106	<100	<100	110	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	GEYSER17 13.80kV Gen Unit 1 & FULTON-GEYSR16-GEYSR12-GEYSR14 230kV	P3	G1/N1	<100	<100	110	<100	<100	<100	<100	<100	<100	<100	<100	110	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment



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	GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	100	105	110	<100	<100	<100	<100	<100	106	<100	<100	110	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
	GEYSERS #9-LAKEVILLE & EAGLE ROCK-FULTON-SILVERADO LINES	P7	DCTL	101	105	107	<100	<100	<100	<100	<100	107	<100	<100	107	Project: Fulton-Fitch Mountain 60kV Line Reconductor (Fulton-Hopland 60kv Line) Project In-service date: 3/20 Short-term: Action plan Scope expansion to upgrade limiting equipment
32602 NRTH TWR 115 32618 NTRWJCT1 115 1	NRTH TWR 115kV - Section 1E & 1F	P2	P2-4	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	115	102	Continue to monitor future load forecast
	NRTH TWR 115kV - Section 1F & 1G	P2	P2-4	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	115	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1E	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	115	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1F	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	115	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1G	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	115	102	Continue to monitor future load forecast
32618 NTRWJCT1 115 32020 JMSN JCT 115 1	NRTH TWR 115kV - Section 1E & 1F	P2	P2-4	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	116	102	Continue to monitor future load forecast
	NRTH TWR 115kV - Section 1F & 1G	P2	P2-4	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	116	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1E	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	116	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1F	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	116	102	Continue to monitor future load forecast
	NRTH TWR 115kV Section 1G	P2	P2-2	<100	<100	102	<100	<100	<100	<100	<100	<100	<100	116	102	Continue to monitor future load forecast
32654 TULUCAY 60.0 32660 BSLT TAP 60.0 1	Base Case	P0		<100	102	110	<100	<100	<100	<100	<100	105	<100	<100	110	Upgrade limiting equipment
32655 TULCAY1 60.0 32662 TULCY JT 60.0 1	TULUCAY-NAPA #2 60kV	P1	N-1	<100	<100	106	<100	<100	106	<100	<100	102	<100	<100	106	Continue to monitor future load forecast

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
HighWAY 115 kV	Base Case	P0	Base Case	1.02	1.02	0.96	1.02	1.01	0.97	1.06	1.06	1.02	1.06	1.02	0.96	Load power factor correction and voltage support if needed
ALTO 60 kV	Base Case	P0	Base Case	1.02	1.03	0.96	1.03	1.03	0.98	1.06	1.06	1.03	1.07	1.05	0.96	Load power factor correction and voltage support if needed
ANNAPOLS 60 kV	Base Case	P0	Base Case	1.01	1.02	1.00	0.97	0.98	0.98	1.03	1.04	1.01	1.04	0.97	1.00	Load power factor correction and voltage support if needed
BELLVUE 115 kV	Base Case	P0	Base Case	1.06	1.06	0.99	1.06	1.06	1.01	1.06	1.07	1.06	1.07	1.06	0.99	Load power factor correction and voltage support if needed
BOLINAS 60 kV	Base Case	P0	Base Case	1.04	1.05	0.98	1.05	1.04	0.99	1.07	1.07	1.04	1.07	1.05	0.98	Load power factor correction and voltage support if needed
CALISTGA 60 kV	Base Case	P0	Base Case	1.09	1.09	0.97	1.09	1.09	0.97	1.08	1.09	1.09	1.09	1.10	0.97	Load power factor correction and voltage support if needed
CALPELLA 115 kV	Base Case	P0	Base Case	1.06	1.06	1.05	1.06	1.06	1.05	1.06	1.06	1.06	1.06	1.06	1.05	Load power factor correction and voltage support if needed
CARQUINZ 115 kV	Base Case	P0	Base Case	1.06	1.06	0.98	1.05	1.04	1.00	1.08	1.08	1.06	1.08	1.07	0.98	Load power factor correction and voltage support if needed
CLOVRDLE 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
EGLE RCK 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.06	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
ER_FTNJT 115 kV	Base Case	P0	Base Case	1.07	1.08	1.01	1.07	1.07	1.02	1.08	1.08	1.07	1.08	1.07	1.01	Load power factor correction and voltage support if needed
ERFT5_25 115 kV	Base Case	P0	Base Case	1.05	1.05	1.02	1.06	1.06	1.03	1.06	1.06	1.05	1.06	1.05	1.02	Load power factor correction and voltage support if needed
FULTON 60 kV	Base Case	P0	Base Case	1.05	1.05	1.05	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.04	1.05	Load power factor correction and voltage support if needed
FULTON 115 kV	Base Case	P0	Base Case	1.07	1.08	1.01	1.07	1.07	1.03	1.08	1.08	1.07	1.08	1.07	1.01	Load power factor correction and voltage support if needed
GEYSERS34 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
GEYSERS56 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
GEYSR11 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
GREENBRE 60 kV	Base Case	P0	Base Case	1.01	1.03	0.97	1.02	1.03	0.98	1.06	1.06	1.03	1.07	1.04	0.97	Load power factor correction and voltage support if needed
GUALALA 60 kV	Base Case	P0	Base Case	1.00	1.00	0.98	0.95	0.96	0.97	1.02	1.04	1.00	1.04	0.95	0.98	Load power factor correction and voltage support if needed
GYSR78TP 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.06	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
HGHLAND 115 kV	Base Case	P0	Base Case	1.05	1.05	1.02	1.07	1.06	1.04	1.07	1.06	1.05	1.06	1.05	1.02	Load power factor correction and voltage support if needed
HOMEGRND 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.07	1.06	1.04	1.07	1.06	1.05	1.06	1.05	1.03	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
HOMEPROC 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.07	1.06	1.04	1.07	1.06	1.05	1.06	1.05	1.03	Load power factor correction and voltage support if needed
IGNACIO 115 kV	Base Case	P0	Base Case	1.05	1.05	1.00	1.06	1.05	1.01	1.07	1.07	1.05	1.07	1.05	1.00	Load power factor correction and voltage support if needed
INDIN VL 115 kV	Base Case	P0	Base Case	1.05	1.06	1.03	1.08	1.07	1.05	1.08	1.07	1.05	1.07	1.07	1.03	Load power factor correction and voltage support if needed
JMSCNPMP 115 kV	Base Case	P0	Base Case	1.05	1.06	0.99	1.05	1.05	1.00	1.07	1.08	1.06	1.08	1.06	0.99	Load power factor correction and voltage support if needed
KONOCI6 60 kV	Base Case	P0	Base Case	1.04	1.05	1.03	1.05	1.03	1.01	1.05	1.05	1.05	1.06	1.04	1.03	Load power factor correction and voltage support if needed
LS GLLNS 115 kV	Base Case	P0	Base Case	1.05	1.05	0.99	1.05	1.05	1.00	1.07	1.07	1.05	1.07	1.05	0.99	Load power factor correction and voltage support if needed
LUCERNE 115 kV	Base Case	P0	Base Case	1.05	1.05	1.04	1.06	1.06	1.05	1.07	1.07	1.05	1.07	1.06	1.04	Load power factor correction and voltage support if needed
MENDOCNO 115 kV	Base Case	P0	Base Case	1.07	1.07	1.05	1.06	1.07	1.06	1.07	1.07	1.06	1.07	1.07	1.05	Load power factor correction and voltage support if needed
MEYERS 115 kV	Base Case	P0	Base Case	1.06	1.06	0.98	1.05	1.04	1.00	1.08	1.08	1.06	1.08	1.07	0.98	Load power factor correction and voltage support if needed
MNTCLOPH 115 kV	Base Case	P0	Base Case	1.07	1.08	1.00	1.07	1.07	1.01	1.09	1.09	1.07	1.09	1.07	1.00	Load power factor correction and voltage support if needed
MONTCLLO 115 kV	Base Case	P0	Base Case	1.07	1.08	1.00	1.07	1.07	1.01	1.09	1.09	1.07	1.09	1.07	1.00	Load power factor correction and voltage support if needed
MPE 115 kV	Base Case	P0	Base Case	1.05	1.05	1.03	1.05	1.05	1.04	1.05	1.05	1.05	1.05	1.05	1.03	Load power factor correction and voltage support if needed
NOVATO 60 kV	Base Case	P0	Base Case	1.05	1.05	0.99	1.05	1.05	1.01	1.07	1.07	1.05	1.07	1.05	0.99	Load power factor correction and voltage support if needed
NRTH TWR 115 kV	Base Case	P0	Base Case	1.05	1.05	1.02	1.05	1.05	1.02	1.06	1.06	1.05	1.06	1.04	1.02	Load power factor correction and voltage support if needed
NTWR ALT 115 kV	Base Case	P0	Base Case	1.01	1.02	0.96	1.02	1.01	0.97	1.06	1.06	1.02	1.06	1.02	0.96	Load power factor correction and voltage support if needed
OLEMA 60 kV	Base Case	P0	Base Case	1.03	1.04	0.97	1.04	1.04	0.98	1.07	1.07	1.04	1.07	1.05	0.97	Load power factor correction and voltage support if needed
PENNGRVE 115 kV	Base Case	P0	Base Case	1.05	1.06	1.00	1.05	1.05	1.01	1.05	1.06	1.05	1.06	1.05	1.00	Load power factor correction and voltage support if needed
PUEBLO 115 kV	Base Case	P0	Base Case	1.04	1.04	0.99	1.04	1.04	1.01	1.05	1.05	1.04	1.06	1.03	0.99	Load power factor correction and voltage support if needed
REDBUD 115 kV	Base Case	P0	Base Case	1.05	1.05	1.04	1.05	1.05	1.04	1.06	1.06	1.05	1.06	1.05	1.04	Load power factor correction and voltage support if needed
RINCON 115 kV	Base Case	P0	Base Case	1.07	1.08	1.01	1.07	1.07	1.02	1.08	1.08	1.08	1.08	1.07	1.01	Load power factor correction and voltage support if needed
SAN RAFL 115 kV	Base Case	P0	Base Case	1.04	1.05	0.99	1.05	1.05	1.00	1.07	1.07	1.05	1.07	1.05	0.99	Load power factor correction and voltage support if needed
SAUSALTO 60 kV	Base Case	P0	Base Case	1.01	1.02	0.95	1.02	1.02	0.97	1.06	1.06	1.02	1.06	1.04	0.95	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
SILVERDO 115 kV	Base Case	P0	Base Case	1.07	1.07	1.00	1.07	1.07	1.01	1.08	1.08	1.07	1.09	1.06	1.00	Load power factor correction and voltage support if needed
SKAGGS 115 kV	Base Case	P0	Base Case	1.05	1.06	1.00	1.05	1.05	1.01	1.07	1.07	1.05	1.07	1.06	1.00	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	Base Case	P0	Base Case	1.07	1.07	0.99	1.07	1.07	1.01	1.08	1.08	1.07	1.08	1.07	0.99	Load power factor correction and voltage support if needed
ST.HELNA 60 kV	Base Case	P0	Base Case	1.07	1.08	1.01	1.08	1.08	1.01	1.07	1.07	1.07	1.08	1.08	1.01	Load power factor correction and voltage support if needed
STAFFORD 60 kV	Base Case	P0	Base Case	1.04	1.05	0.97	1.05	1.05	0.99	1.07	1.07	1.05	1.07	1.05	0.97	Load power factor correction and voltage support if needed
STNY PTP 115 kV	Base Case	P0	Base Case	1.06	1.07	0.99	1.07	1.06	1.01	1.07	1.07	1.06	1.07	1.06	0.99	Load power factor correction and voltage support if needed
STONY PT 115 kV	Base Case	P0	Base Case	1.06	1.07	0.99	1.06	1.06	1.01	1.07	1.07	1.06	1.07	1.06	0.99	Load power factor correction and voltage support if needed
TOCALOMA 60 kV	Base Case	P0	Base Case	1.04	1.04	0.97	1.05	1.04	0.99	1.07	1.07	1.04	1.07	1.05	0.97	Load power factor correction and voltage support if needed
TWR2_19 60 kV	Base Case	P0	Base Case	1.04	1.05	0.99	1.05	1.05	1.00	1.07	1.07	1.05	1.07	1.05	0.99	Load power factor correction and voltage support if needed
TWR2_20 60 kV	Base Case	P0	Base Case	1.04	1.05	0.99	1.05	1.05	1.00	1.07	1.07	1.05	1.07	1.05	0.99	Load power factor correction and voltage support if needed
UKIAH 115 kV	Base Case	P0	Base Case	1.05	1.06	1.04	1.05	1.06	1.05	1.06	1.06	1.05	1.06	1.06	1.04	Load power factor correction and voltage support if needed
WOODACRE 60 kV	Base Case	P0	Base Case	1.04	1.05	0.99	1.05	1.04	1.00	1.07	1.07	1.04	1.07	1.05	0.99	Load power factor correction and voltage support if needed
HighWAY 115 kV	LAKEVILE 230kV - Section 2E & 2D	P2	P2-4	0.99	0.99	0.88	1.00	0.98	0.92	1.05	1.05	0.99	1.06	1.00	0.88	Continue to monitor future load forecast
BELLVUE 115 kV	FULTON 115kV - Section 2D & 1D	P2	P2-4	1.01	1.02	0.87	1.02	1.02	0.87	1.05	1.06	1.01	1.06	1.04	0.87	Continue to monitor future load forecast
BELLVUE 115 kV	LAKEVLLE 115kV - Section 1D & 2D	P2	P2-4	1.08	1.08	0.96	1.08	1.08	0.98	1.10	1.10	1.08	1.11	1.08	0.96	Load power factor correction and voltage support if needed
CORONA 115 kV	LAKEVLLE 115kV - Section 1D & 2D	P2	P2-4	1.08	1.08	0.95	1.07	1.07	0.97	1.10	1.10	1.08	1.11	1.08	0.95	Load power factor correction and voltage support if needed
CORONA 115 kV	LAKEVLLE 115kV Section 1D	P2	P2-2	1.08	1.09	0.96	1.08	1.08	0.97	1.09	1.10	1.08	1.10	1.08	0.96	Load power factor correction and voltage support if needed
HIGHLAND 115 kV	EAGLE ROCK-CORTINA 115kV (EGLE RCK-LWRLAKEJ)	P2	P2-1	1.05	1.05	1.01	1.11	1.09	1.04	1.10	1.07	1.05	1.07	1.06	1.01	Load power factor correction and voltage support if needed
HIGHLAND 115 kV	EGLE RCK - MA 115kV & EAGLE ROCK-REDBUD line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HIGHLAND 115 kV	EGLE RCK - MA 115kV & EGLE RCK-FULTON-SILVERDO line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HIGHLAND 115 kV	EGLE RCK 115kV Section MA	P2	P2-2	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEGRND 115 kV	EAGLE ROCK-CORTINA 115kV (EGLE RCK-LWRLAKEJ)	P2	P2-1	1.05	1.05	1.01	1.11	1.09	1.04	1.10	1.07	1.05	1.07	1.06	1.01	Load power factor correction and voltage support if needed

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
HOMEGRND 115 kV	EGLE RCK - MA 115kV & EAGLE ROCK-REDBUD line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEGRND 115 kV	EGLE RCK - MA 115kV & EGLE RCK-FULTON-SILVERDO line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEGRND 115 kV	EGLE RCK 115kV Section MA	P2	P2-2	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEPROC 115 kV	EAGLE ROCK-CORTINA 115kV (EGLE RCK-LWRLAKEJ)	P2	P2-1	1.05	1.05	1.01	1.11	1.09	1.04	1.10	1.07	1.05	1.07	1.06	1.01	Load power factor correction and voltage support if needed
HOMEPROC 115 kV	EGLE RCK - MA 115kV & EAGLE ROCK-REDBUD line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEPROC 115 kV	EGLE RCK - MA 115kV & EGLE RCK-FULTON-SILVERDO line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMEPROC 115 kV	EGLE RCK 115kV Section MA	P2	P2-2	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMSTKTP 115 kV	EAGLE ROCK-CORTINA 115kV (EGLE RCK-LWRLAKEJ)	P2	P2-1	1.05	1.05	1.01	1.11	1.09	1.04	1.10	1.07	1.05	1.07	1.06	1.01	Load power factor correction and voltage support if needed
HOMSTKTP 115 kV	EGLE RCK - MA 115kV & EAGLE ROCK-REDBUD line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMSTKTP 115 kV	EGLE RCK - MA 115kV & EGLE RCK-FULTON-SILVERDO line	P2	P2-3	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
HOMSTKTP 115 kV	EGLE RCK 115kV Section MA	P2	P2-2	1.04	1.04	1.01	1.10	1.09	1.03	1.11	1.08	1.04	1.08	1.06	1.01	Load power factor correction and voltage support if needed
LUCERNE 115 kV	MENDOCNO - 1D 115kV & MENDOCINO-REDBUD line	P2	P2-3	1.05	1.06	1.05	1.09	1.07	1.03	1.11	1.10	1.05	1.10	1.07	1.05	Load power factor correction and voltage support if needed
LUCERNE 115 kV	MENDOCNO - 1D 115kV & MENDOCINO-UKIAH line	P2	P2-3	1.05	1.06	1.05	1.09	1.07	1.03	1.11	1.10	1.05	1.10	1.07	1.05	Load power factor correction and voltage support if needed
LUCERNE 115 kV	MENDOCNO 115kV Section 1D	P2	P2-2	1.05	1.06	1.05	1.09	1.07	1.03	1.11	1.10	1.05	1.10	1.07	1.05	Load power factor correction and voltage support if needed
MENDOCNO 115 kV	MENDOCNO - 1D 115kV & MENDOCINO-REDBUD line	P2	P2-3	1.07	1.07	1.07	1.11	1.08	1.03	1.12	1.12	1.07	1.13	1.07	1.07	Load power factor correction and voltage support if needed
MENDOCNO 115 kV	MENDOCNO - 1D 115kV & MENDOCINO-UKIAH line	P2	P2-3	1.07	1.07	1.07	1.11	1.08	1.03	1.12	1.12	1.07	1.13	1.07	1.07	Load power factor correction and voltage support if needed
MENDOCNO 115 kV	MENDOCNO 115kV Section 1D	P2	P2-2	1.07	1.07	1.07	1.11	1.08	1.03	1.12	1.12	1.07	1.13	1.07	1.07	Load power factor correction and voltage support if needed
PENNGRVE 115 kV	LAKEVILLE 115kV - Section 1D & 2D	P2	P2-4	1.07	1.08	0.96	1.07	1.08	0.97	1.10	1.10	1.07	1.11	1.08	0.96	Load power factor correction and voltage support if needed
SNTA RSA 115 kV	FULTON 115kV - Section 2D & 1D	P2	P2-4	1.02	1.03	0.85	1.03	1.03	0.85	1.06	1.07	1.02	1.07	1.04	0.85	Continue to monitor future load forecast
SNTA RSA 115 kV	LAKEVILLE 115kV - Section 1D & 2D	P2	P2-4	1.07	1.08	0.97	1.08	1.08	0.99	1.10	1.10	1.07	1.11	1.08	0.97	Load power factor correction and voltage support if needed
SONOMA 115 kV	LAKEVILLE 115kV - Section 1D & 2D	P2	P2-4	0.96	0.98	0.91	0.97	0.99	0.93	1.11	1.09	0.97	1.10	1.00	0.91	Load power factor correction and voltage support if needed
STNY PTP 115 kV	LAKEVILLE 115kV - Section 1D & 2D	P2	P2-4	1.07	1.08	0.96	1.08	1.08	0.98	1.10	1.10	1.07	1.11	1.08	0.96	Load power factor correction and voltage support if needed

Study Area: PG&E North Coast & North Bay

High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
BELLVUE 115 kV	GEYSER11 13.80kV Gen Unit 1 & SANTA ROSA-CORONA 115kV	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.10	<1.10	1.11	<1.10	<1.10	Load power factor correction and voltage support if needed
BELLVUE 115 kV	GEYSER11 13.80kV Gen Unit 1 & CORONA-LAKEVILLE 115kV	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.10	<1.10	1.11	<1.10	<1.10	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.13	<1.10	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
BIG RIVR 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.14	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
ELK 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.11	<1.10	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
ELK 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.12	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
FRT BRGG 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.11	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
GARCIA 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.11	<1.10	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
GARCIA 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.12	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
GARCIA J 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.11	<1.10	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
GARCIA J 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.12	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
PNT ARNA 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.11	<1.10	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
PNT ARNA 60 kV	GEYSER11 13.80kV Gen Unit 1 & BIG RIVR SVD=v	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.12	<1.10	<1.10	<1.10	<1.10	Load power factor correction and voltage support if needed
STNY PTP 115 kV	GEYSER11 13.80kV Gen Unit 1 & SANTA ROSA-CORONA 115kV	P3	G1/N1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.10	<1.10	1.11	<1.10	<1.10	Load power factor correction and voltage support if needed
BELLVUE 115 kV	FULTON 230/115kV TB 4 FULTON 230/115kV TB 9 kV	P6	N-1-1	>0.9	>0.9	0.88	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	0.88	Continue to monitor future load forecast
CALPELLA 115 kV	GEYSERS #3-CLOVERDALE 115kV MENDOCINO-UKIAH 115kV kV	P6	N-1-1	>0.9	>0.9	0.82	>0.9	0.88	0.82	>0.9	>0.9	>0.9	>0.9	>0.9	0.82	Continue to monitor future load forecast
CLOVRDLE 115 kV	GEYSERS #3-CLOVERDALE 115kV MENDOCINO-UKIAH 115kV kV	P6	N-1-1	>0.9	>0.9	0.86	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	Continue to monitor future load forecast
CORONA 115 kV	IGNACIO SVD=r CORONA-LAKEVILLE 115kV kV	P6	N-1-1	>0.9	>0.9	0.00	>0.9	>0.9	>0.9	1.10	1.11	>0.9	1.11	>0.9	>0.9	Continue to monitor future load forecast
HIGHWAY 115 kV	IGNACIO-SOBRANTE 230kV FULTON-GEYSR16-GEYSR12-GEYSR14 230kV kV	P6	N-1-1	>0.9	>0.9	0.89	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	0.89	Continue to monitor future load forecast
LAKEVILE 115 kV	LAKEVILLE 230/115kV TB 1 LAKEVILLE 230/115kV TB 2 kV	P6	N-1-1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.10	1.10	<1.10	1.11	<1.10	<1.10	Load power factor correction and voltage support if needed
MONTCLLO 115 kV	FULTON 230/115kV TB 4 FULTON 230/115kV TB 9 kV	P6	N-1-1	>0.9	>0.9	0.86	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	Continue to monitor future load forecast
RINCON 115 kV	FULTON 230/115kV TB 4 FULTON 230/115kV TB 9 kV	P6	N-1-1	>0.9	>0.9	0.87	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	0.87	Continue to monitor future load forecast

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High/Low Voltages



Substation	Contingency (All and Worst P6)	Category	Category Description	Voltage PU (Baseline Scenarios)								Voltage PU (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
SILVERDO 115 kV	FULTON 230/115kV TB 4 FULTON 230/115kV TB 9 kV	P6	N-1-1	>0.9	>0.9	0.86	>0.9	>0.9	0.87	>0.9	>0.9	>0.9	>0.9	>0.9	0.86	Continue to monitor future load forecast
SNTA RSA 115 kV	FULTON 230/115kV TB 4 FULTON 230/115kV TB 9 kV	P6	N-1-1	>0.9	>0.9	0.85	>0.9	>0.9	0.86	>0.9	>0.9	>0.9	>0.9	>0.9	0.85	Continue to monitor future load forecast
SONOMA 115 kV	LAKEVILLE 230/115kV TB 1 LAKEVILLE 230/115kV TB 2 kV	P6	N-1-1	<1.10	<1.10	<1.10	<1.10	<1.10	<1.10	1.10	1.10	<1.10	1.11	<1.10	<1.10	Load power factor correction and voltage support if needed
UKIAH 115 kV	GEYSERS #3-CLOVERDALE 115kV MENDOCINO-UKIAH 115kV kV	P6	N-1-1	>0.9	>0.9	0.85	>0.9	0.88	0.85	>0.9	>0.9	0.90	>0.9	>0.9	0.85	Continue to monitor future load forecast
HighWAY 115 kV	GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	1.00	1.00	0.89	1.01	0.99	0.93	1.06	1.06	1.00	1.06	1.00	0.89	Continue to monitor future load forecast
BELLVUE 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	1.02	1.02	0.88	1.03	1.02	0.87	1.05	1.06	1.02	1.06	1.04	0.88	Continue to monitor future load forecast
MONROE1 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	1.03	1.03	0.85	1.03	1.03	0.84	1.06	1.07	1.02	1.08	1.05	0.85	Continue to monitor future load forecast
MONROE2 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	1.02	1.03	0.84	1.04	1.03	0.84	1.06	1.07	1.02	1.08	1.05	0.84	Continue to monitor future load forecast
NTWR ALT 115 kV	GEYSERS #12-FULTON & GEYSERS #9-LAKEVILLE LINES	P7	DCTL	0.99	1.00	0.00	1.00	0.99	0.93	1.06	1.06	0.99	1.06	1.00	0.00	Continue to monitor future load forecast
SNTA RSA 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	1.02	1.03	0.85	1.03	1.03	0.85	1.06	1.07	1.02	1.07	1.04	0.85	Continue to monitor future load forecast
STONY PT 115 kV	FULTON-SANTA ROSA #1 & FULTON-SANTA ROSA #2 LINES	P7	DCTL	1.02	1.02	0.87	1.03	1.02	0.86	1.05	1.06	1.02	1.07	1.04	0.87	Continue to monitor future load forecast

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Voltage Deviation



Substation	Contingency (All and Worst P6)	Category	Category Description	Post Cont. Voltage Deviation % (Baseline Scenarios)								Post Cont. Voltage Deviation % (Sensitivity Scenarios)				ISO Approved Projects & Potential Mitigation Solutions
				2021 Summer Peak	2024 Summer Peak	2029 Summer Peak	2021 Winter Peak	2024 Winter Peak	2029 Winter Peak	2021 Spring Off-Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	2021 SP Heavy Renewable & Min Gas Gen	2029 Retirement of QF Generations	
CLER LKE 60 kV	EGLE RCK 115/60kV TB 1	P1	N-1	4	5	8	2	8	8	2	2	6	2	5	8	Continue to monitor future load forecast
CLER LKE 60 kV	KONOCTI-EAGLE ROCK 60kV	P1	N-1	4	5	7	2	8	8	3	2	6	2	5	7	Continue to monitor future load forecast
KONOCTI6 60 kV	EGLE RCK 115/60kV TB 1	P1	N-1	8	7	12	4	12	11	5	4	9	3	8	12	Continue to monitor future load forecast
KONOCTI6 60 kV	KONOCTI-EAGLE ROCK 60kV	P1	N-1	8	8	12	4	13	12	5	4	9	4	8	12	Continue to monitor future load forecast
MIDDLTWN 60 kV	EGLE RCK 115/60kV TB 1	P1	N-1	8	5	10	0	10	5	5	3	7	3	9	10	Load power factor correction and voltage support if needed
MIDDLTWN 60 kV	KONOCTI-EAGLE ROCK 60kV	P1	N-1	8	6	10	0	10	5	5	3	7	3	9	10	Load power factor correction and voltage support if needed

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Transient Stability



Contingency	Category	Category Description	Transient Stability Performance					Potential Mitigation Solutions
			Baseline Scenarios			Sensitivity Scenarios		
			2024 Summer Peak	2029 Summer Peak	2024 Spring Off-Peak	2024 SP High CEC Forecast	2024 SpOP Hi Renew & Min Gas Gen	
Bus fault at LAKEVILLE 230kV	P2-2	Bus	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Internal fault at Non-bus-tie-breaker #222 at LAKEVILLE 230kV	P2-3	Non-Bus-Tie Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Internal fault at Bus-tie-breaker #422 at LAKEVILLE 230kV	P2-4	Bus-Tie Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
GEYSER11 Unit 1 and LAKEVILLE -CR2T3_18 230kV No.1 Line	P3-2	G-1/N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #212 protecting LAKEVILLE-CR2T3_18 230kV #1 Line	P4-2	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #282 protecting LAKEVLLE/LAKEVILLE 115/230kV No.2 Transformer	P4-3	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #202 protecting LAKEVILLE 230 kV Bus #2 SEC E	P4-5	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #422 protecting LAKEVILLE 230kV Bus #2 SEC E	P4-6	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LAKEVILLE -CR2T3_18 230kV No.1 Line	P5-2	Non-Redundant Relay	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LAKEVILLE/LAKEVLLE 230/115 kV No.1 Transformer	P5-3	Non-Redundant Relay	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LAKEVILLE 230kV SEC E	P5-5	Non-Redundant Relay	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LAKEVILLE -CR2T3_18 230kV No.1 Line and TULUCAY-VACA-DIX 230kV No.1 Line	P6-1	N-1-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LAKEVILLE -CR2T3_18 230kV No.1 Line and IGNACIO/IGNACIO 230/115 kV No.6 Transformer	P6-2	N-1-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
IGNACIO/IGNACIO 230/115 kV No.6 Transformer	P1-3	N-1	WECC/NERC criteria not met	No Issues	No Issues	No Issues	No Issues	Under review with PTO .
PUEBLO 115kV ID. v SVD	P1-4	N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
LP SAMOA Unit 1 and HUMB_BS1/HUMB_G1 115/13.8 kV No.1 Transformer	P3-3	G-1/N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
GEYSER11 Unit 1 and PUEBLO 115 kV ID v SVD	P3-4	G-1/N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
PUEBLO 115 kV ID v SVD and BIG RIVR 60 kV ID v SVD	P6-3	N-1-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #366 protecting MENDOCNO 115 kV ID v SVD	P4-4	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
MENDOCNO 115 kV ID v SVD	P5-4	Non-Redundant Relay	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Breaker stuck for CB #182 protecting GEYSER78 Unit 1	P4-1	Stuck Breaker	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
GEYSER78 Unit 1	P5-1	Non-Redundant Relay	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
GEYSER11 Unit 1	P1-1	N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
GEYSER11 Unit 1 and GEYSER13 Unit 1	P3-1	G-1/N-1	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Successful reclose on fault on Fulton - Lakeville 230 kV Line and Geysers 9 - Lakeville 230 kV Line	P7-1	DCTL	No Issues	No Issues	No Issues	No Issues	No Issues	No violation
Failed reclose on fault on Fulton - Lakeville 230 kV Line and Geysers 9 - Lakeville 230 kV Line	P7-1	DCTL	No Issues	No Issues	No Issues	No Issues	No Issues	No violation

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Single Contingency Load Drop

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

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

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Single Source Substation with more than 100 MW Load

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

No single source substation with of more than 100 MW