2019-2020 ISO Reliability Assessment - Study Results
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 LAKEVILE 230 30460 VACA-DIX 230 1 | LAKEVILE 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-LAKEVILE-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 |
| | LAKEVILE 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-LAKEVILE-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 | EGLE RCK - 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 HGHLNDJ1 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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>Short term: Action plan |

2019-2020 ISO Reliability Assessment - Study Results
Study Area: PG&E North Coast & North Bay
*Thermal Overloads*

California ISO

| 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 | |
| 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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>Short term: Action plan |
| 31254 CORONA 115 31255 LAKEVLLE 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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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<br>In-service date: TBD<br>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 CLER LKE 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<br>In-service date: 2/22<br>Short-term: Action plan |

2019-2020 ISO Reliability Assessment - Study Results
Study Area: PG&E North Coast & North Bay
*Thermal Overloads*

California ISO

| 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 CLEK LKE 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<br>In-service date: 2/22<br>Short-term: Action plan |
| 31335 GRANITE 60.0 31336 HPLND JT 60.0 1 | EGLE RCK 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<br>In-service date: 2/22<br>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<br>In-service date: 2/22<br>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 & EGLE RCK-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 & EGLE RCK-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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |
| | FULTON-WINDSOR #1 60kV & EGLE RCK-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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |

2019-2020 ISO Reliability Assessment - Study Results
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 | |
| | 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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |

2019-2020 ISO Reliability Assessment - Study Results
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 | |
| 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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |
| | FULTON-HOPLAND 60kV (FULTON-FTCHMTNP) | 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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |

2019-2020 ISO Reliability Assessment - Study Results
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 | |
| | 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<br>In-service date: 3/20<br>Short-term: Action plan<br>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<br>In-service date: 3/20<br>Short-term: Action plan<br>Scope expansion to upgrade limiting equipment |
| 32602 NRTH TWR 115 32618 NTWRJCT1 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 NTWRJCT1 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 |

| 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 |
| KONOCTI6 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 |

| 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 |
| HGHLAND 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 |
| HGHLAND 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 |
| HGHLAND 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 |
| HGHLAND 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 |

| 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 | LAKEVLLE 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 | LAKEVLLE 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 | LAKEVLLE 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 | LAKEVLLE 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 |

| 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 |
| LAKEVLLE 115 kV | LAKEVILE 230/115kV TB 1 LAKEVILE 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 |

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 | |
| 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 | LAKEVILE 230/115kV TB 1 LAKEVILE 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 |

Study Area: PG&E North Coast & North Bay

*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 |

Study Area: PG&E North Coast & North Bay

*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 LAKEVILE 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 LAKEVILE 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 LAKEVILE 230kV | P2-4 | Bus-Tie Breaker | No Issues | No Issues | No Issues | No Issues | No Issues | No violation |
| GEYSER11 Unit 1 and LAKEVILE -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 LAKEVILE-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/LAKEVILE 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 LAKEVILE 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 LAKEVILE 230kV Bus #2 SEC E | P4-6 | Stuck Breaker | No Issues | No Issues | No Issues | No Issues | No Issues | No violation |
| LAKEVILE -CR2T3_18 230kV No.1 Line | P5-2 | Non-Redundant Relay | No Issues | No Issues | No Issues | No Issues | No Issues | No violation |
| LAKEVILE/LAKEVLLE 230/115 kV No.1 Transformer | P5-3 | Non-Redundant Relay | No Issues | No Issues | No Issues | No Issues | No Issues | No violation |
| LAKEVILE 230kV SEC E | P5-5 | Non-Redundant Relay | No Issues | No Issues | No Issues | No Issues | No Issues | No violation |
| LAKEVILE -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 |
| LAKEVILE -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. To be updated in draft TP . |
| 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 |

Study Area: PG&E North Coast & North Bay

*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

2019-2020 ISO Reliability Assessment - Study Results

Study Area: PG&E North Coast & North Bay

*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