

2014-2015 ISO Reliability Assessment - Study Results

Study Area: **PG&E Los Padres - Summer Peak**

Thermal Overloads



| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|---------------------------------|--|----------|----------------------|----------------------|------------------------|------|--|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-01 | SAN MIGL-COLNGA 1 70 kV #1 Line | Templeton 230/70 kV #1 Bank | B | T-1 | Diverge | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-02 | SN LS OB-CARRIZO 115 kV #1 Line | MORRO BAY 230 kV CB 612 | C2 | CB | Diverge | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-03 | SAN MIGL-COLNGA 1 70 kV #1 Line | Estrella 230/70 kV & Templeton 230/70 kV Banks | C3 | T-1-1 | <100 | 210 | 216 | Install SPS to trip Q877 as part of the Estrella Project |
| LP-SP-T-04 | SAN MIGL-ESTRELLA 70 kV #1 Line | Estrella 230/70 kV & Templeton 230/70 kV Banks | C3 | T-1-1 | <100 | 181 | 185 | Install SPS to trip Q877 as part of the Estrella Project |
| LP-SP-T-05 | ESTRELLA-PSA RBLS 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | <100 | 109 | 108 | Install SPS to trip Q877 as part of the Estrella Project |
| LP-SP-T-06 | MORRO BY 115/230 kV #6 Bank | Mesa 230/115 kV Bank #2 & #3 | C3 | T-1-1 | 146 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Morro Bay Transformer Addition Project |
| LP-SP-T-07 | SAN MIGL-COLNGA 1 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 229 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-08 | SAN MIGL-PSA RBLS 70 kV #1 Line | Templeton-Gates 230 kV Line & Templeton 230/70 kV Bank | C3 | L-1/T-1 | 175 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-09 | TEMPL7-TEMPL J2 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 138 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-10 | TEMPL J2-ATASCDRO 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 132 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |

2014-2015 ISO Reliability Assessment - Study Results

Study Area: **PG&E Los Padres - Summer Peak**

Thermal Overloads



| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|----------------------------------|--|----------|----------------------|----------------------|------------------------|------|--|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-11 | ATASCDRO-SN LS OB 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 171 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-12 | ATASCDRO-CACOS J2 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 126 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-13 | CACOS J2-CAYUCOS 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 131 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-14 | MUSTNG J-SN LS OB 70 kV #1 Line | Morro Bay-Templeton & Templeton-Gates 230 kV Lines | C3 | L-1-1 | 153 | <100 | <100 | Short term: Existing Action Plan Long term: Mitigated by the Estrella Substation Project |
| LP-SP-T-15 | MORRO BY-GLDTRJC1 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 137 | 149 | <100 | Short term: Action Plan - - modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-16 | GLDTRJC1-FTHILTP2 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 124 | 138 | <100 | Short term: Action Plan - - modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-17 | FTHILTP2-SN LS OB 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 125 | 139 | <100 | Short term: Action Plan - - modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |

2014-2015 ISO Reliability Assessment - Study Results

Study Area: **PG&E Los Padres - Summer Peak**

Thermal Overloads



| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|----------------------------------|--|----------|----------------------|----------------------|------------------------|------|---|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-18 | MORRO BY-GLDTRJC2 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 133 | 146 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-19 | GLDTRJC2-FTHILTP1 115 kV #1 Line | Mesa 230/115 kV Bank #2 & #3 | C3 | T-1-1 | 133 | 145 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-20 | FTHILTP1-SN LS OB 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 128 | 141 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-21 | SN LS OB-CARRIZO 115 kV #1 Line | Morro Bay-Mesa & Morro Bay-Diablo 230 kV Lines | C3 | L-1-1 | 139 | 130 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-22 | SN LS OB-SNTA MRA 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 276 | 307 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |

| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|----------------------------------|---|----------|----------------------|----------------------|------------------------|------|---|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-23 | SNTA MRA-FRWAYTP 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 117 | 114 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-24 | SNTAMRTP-FAIRWAY 115 kV #1 Line | Mesa 230/115 kV Bank #2 & #3 | C3 | T-1-1 | | 101 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-25 | SN LS OB-OCEANO 115 kV #1 Line | Morro Bay-Diablo & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 228 | 250 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-26 | OCEANO-UNION OL 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 181 | 201 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-27 | MESA_PGE-UNION OL 115 kV #1 Line | Morro Bay-Mesa & Diablo-Mesa 230 kV Lines | C3 | L-1-1 | 181 | 193 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |

2014-2015 ISO Reliability Assessment - Study Results

Study Area: **PG&E Los Padres - Summer Peak**

Thermal Overloads



| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|----------------------------------|----------------------------------|----------|----------------------|----------------------|------------------------|------|---|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-28 | MESA_PGE-S.M.ASSO 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 140 | <100 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-29 | S.M.ASSO-SISQUOC 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 140 | <100 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-30 | SISQUOC-PALMR 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 302 | 286 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-31 | PALMR-ZACA 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 298 | 282 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-32 | S.YNZ JT-ZACA 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 334 | 317 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |

| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|------------|----------------------------------|--|----------|----------------------|----------------------|------------------------|------|---|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-SP-T-33 | S.YNZ JT-CABRILLO 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 120 | 114 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-34 | LOMPCJ1-CABRILLO 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 110 | 104 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-35 | SURF JCT-LOMPCJ1 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 110 | 104 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |
| LP-SP-T-36 | SN LS OB-CARRIZO 115 kV #1 Line | Morro Bay-Mesa and Morro Bay-Diablo 230 kV Lines | C5 | L-1-1 | 135 | 125 | <100 | Short term: Action Plan -- modified Santa Maria /Mesa SPS/UVLS Long term: Midway-Andrew 230 kV Project |

| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%) | | | Potential Mitigation Solutions |
|-------------|----------------------------------|--|----------|----------------------|----------------------|------------------------|-----|---|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| LP-NPK-T-01 | SAN MIGL-COLNGA 1 70 kV #1 Line | Paso Robles-Templeton 70 kV Line | B | L-1 | 115 | <100 | N/A | Install SPS to trip Q877 as part of the Estrella Project |
| LP-NPK-T-02 | SN LS OB-SNTA MRA 115 kV #1 Line | Morro Bay-Diablo & Morro Bay-Mesa 230 kV Lines | C3 | L-1-1 | 112 | 105 | N/A | Install SPS to trip Q877 as part of the Estrella Project |
| LP-NPK-T-03 | SISQUOC-PALMR 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 116 | 108 | N/A | Short term: Action Plan Long term: Mitigated by the Midway-Andrew 230 kV Project |
| LP-NPK-T-04 | PALMR-ZACA 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 114 | 107 | N/A | Short term: Action Plan Long term: Mitigated by the Midway-Andrew 230 kV Project |
| LP-NPK-T-05 | S.YNZ JT-ZACA 115 kV #1 Line | Mesa-Divide 115 kV #1 & #2 Lines | C3 | L-1-1 | 129 | 121 | N/A | Short term: Action Plan Long term: Mitigated by the Midway-Andrew 230 kV Project |



| ID | Substation | Worst Contingency | Category | Category Description | Post Cont. Voltage Deviation % | | | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|--------------------------------|------------------|------------------|--------------------------------|
| | | | | | 2016 Summer Peak | 2019 Summer Peak | 2024 Summer Peak | |
| | | | | | | | | |

No voltage deviation concerns identified.



Voltage Deviations

| ID | Substation | Worst Contingency | Category | Category Description | Post Cont. Voltage Deviation % | | | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|--------------------------------|------------------------|-----|--------------------------------|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| | | | | | | | | |

No voltage deviation concerns identified.



| ID | Substation | Worst Contingency | Category | Category Description | Voltage (PU) | | | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|------------------|------------------|------------------|--------------------------------|
| | | | | | 2016 Summer Peak | 2019 Summer Peak | 2024 Summer Peak | |
| | | | | | | | | |

No high/low voltage concerns identified.



| ID | Substation | Worst Contingency | Category | Category Description | Voltage (PU) | | | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|----------------------|------------------------|-----|--------------------------------|
| | | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| | | | | | | | | |

No high/low voltage concerns identified.

Study Area: **PG&E Los Padres - Summer Peak**



Single Contingency Load Drop

| ID | Worst Contingency | Category | Category Description | Amount of Load Drop (MW) | | | Potential Mitigation Solutions |
|----|-------------------|----------|----------------------|--------------------------|------------------|------------------|--------------------------------|
| | | | | 2016 Summer Peak | 2019 Summer Peak | 2024 Summer Peak | |
| | | | | | | | |

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

2014-2015 ISO Reliability Assessment - Study Results

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



Single Contingency Load Drop

| ID | Worst Contingency | Category | Category Description | Amount of Load Drop (MW) | | | Potential Mitigation Solutions |
|----|-------------------|----------|----------------------|--------------------------|------------------------|-----|--------------------------------|
| | | | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| | | | | | | | |

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

Study Area: **PG&E Los Padres - Summer Peak**

Single Source Substation with more than 100 MW Load



| ID | Substation | Load Served (MW) | | | Potential Mitigation Solutions |
|----|------------|------------------|------------------|------------------|--------------------------------|
| | | 2016 Summer Peak | 2019 Summer Peak | 2024 Summer Peak | |
| | | | | | |

No single source substation with more than 100 MW Load

2014-2015 ISO Reliability Assessment - Study Results

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

Single Source Substation with more than 100 MW Load



| ID | Substation | Load Served (MW) | | | Potential Mitigation Solutions |
|----|------------|----------------------|------------------------|-----|--------------------------------|
| | | 2016 Summer Off-Peak | 2019 Summer Light Load | N/A | |
| | | | | | |

No single source substation with more than 100 MW Load