

**Thermal Overloads**

| ID      | Overloaded Facility         | Worst Contingency   | Category | Category Description | Loading (%)      |                  |                  | Potential Mitigation Solutions  |
|---------|-----------------------------|---|----------|----------------------|------------------|------------------|------------------|---|
|         |                             |   |          |                      | 2014 Summer Peak | 2017 Summer Peak | 2022 Summer Peak |   |
| MTR-T-1 | Barre - Del Amo 230 kV Line | Alamitos - Center 230 kV Line, Alamitos - Lighthipe 230 kV Line | C        | N-2                  | <100%            | <100%            | 106%             | (a) SPS to reduce generation, or (b) Upgrade Barre - Del Amo 230 kV Line. |

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|----|---------------------|-------------------|----------|----------------------|------------------------|----------------------|-----|--------------------------------|
|    |                     |                   |          |                      | 2014 Summer Light Load | 2017 Spring Off-Peak | N/A |                                |
|    |                     |                   |          |                      |                        |                      |     |                                |

No thermal overloads identified.

2012/2013 ISO Reliability Assessment - Preliminary Study Results

Study Area: **SCE Metro - Summer Peak with Renewables**



**Voltage Deviations**

| ID       | Substation   | Worst Contingency                         | Category | Category Description | Post Cont. Voltage Deviation % |                  |                  | Potential Mitigation Solutions |
|----------|--------------|---|----------|----------------------|--------------------------------|------------------|------------------|--------------------------------|
|          |              |   |          |                      | 2014 Summer Peak               | 2017 Summer Peak | 2022 Summer Peak |                                |
| MTR-DV-1 | Viejo 230 kV | One SONGS Unit, SONGS - Viejo 230 kV Line | B        | G-1/L-1              | <5%                            | <5%              | 5.20%            | Add shunt capacitor at Viejo   |



Voltage Deviations

| ID | Substation | Worst Contingency | Category | Category Description | Post Cont. Voltage Deviation % |                      |     | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|--------------------------------|----------------------|-----|--------------------------------|
|    |            |                   |          |                      | 2014 Summer Light Load         | 2017 Spring Off-Peak | N/A |                                |
|    |            |                   |          |                      |                                |                      |     |                                |

No voltage deviations identified.



High/Low Voltage

| ID | Substation | Worst Contingency | Category | Category Description | Voltage (PU)     |                  |                  | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|------------------|------------------|------------------|--------------------------------|
|    |            |                   |          |                      | 2014 Summer Peak | 2017 Summer Peak | 2022 Summer Peak |                                |
|    |            |                   |          |                      |                  |                  |                  |                                |

No high/low voltage issues identified

**High/Low Voltage**

| ID | Substation | Worst Contingency | Category | Category Description | Voltage (PU)           |                      |     | Potential Mitigation Solutions |
|----|------------|-------------------|----------|----------------------|------------------------|----------------------|-----|--------------------------------|
|    |            |                   |          |                      | 2014 Summer Light Load | 2017 Spring Off-Peak | N/A |                                |
|    |            |                   |          |                      |                        |                      |     |                                |

No high/low voltage issues identified.



Transient Stability

| ID       | Contingency                        | Category | Category Description | Transient Stability Performance |                  |                  | Potential Mitigation Solutions |
|----------|------------------------------------|----------|----------------------|---------------------------------|------------------|------------------|--------------------------------|
|          |                                    |          |                      | 2014 Summer Peak                | 2017 Summer Peak | 2022 Summer Peak |                                |
| MTR-TR-1 | Loss of Lugo 500/230 kV Substation | D        | Substation           | unstable                        | unstable         | unstable         | under review                   |

**Transient Stability**

| ID       | Contingency                        | Category | Category Description | Transient Stability Performance |                      |     | Potential Mitigation Solutions |
|----------|------------------------------------|----------|----------------------|---------------------------------|----------------------|-----|--------------------------------|
|          |                                    |          |                      | 2014 Summer Light Load          | 2017 Spring Off-Peak | N/A |                                |
| MTR-TR-2 | Loss of Lugo 500/230 kV Substation | D        | Substation           | N/A                             | unstable             |     | under review                   |



**Post-Transient Thermal Overloads**

| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%)      |                  |                  | Potential Mitigation Solutions |
|----|---------------------|-------------------|----------|----------------------|------------------|------------------|------------------|--------------------------------|
|    |                     |                   |          |                      | 2014 Summer Peak | 2017 Summer Peak | 2022 Summer Peak |                                |
|    |                     |                   |          |                      |                  |                  |                  |                                |

No post-transient thermal overloads identified.

Post-Transient Thermal Overloads

| ID | Overloaded Facility | Worst Contingency | Category | Category Description | Loading (%)            |                      |     | Potential Mitigation Solutions |
|----|---------------------|-------------------|----------|----------------------|------------------------|----------------------|-----|--------------------------------|
|    |                     |                   |          |                      | 2014 Summer Light Load | 2017 Spring Off-Peak | N/A |                                |
|    |                     |                   |          |                      |                        |                      |     |                                |

No post-transient thermal overloads identified.

2012/2013 ISO Reliability Assessment - Preliminary Study Results

Study Area: **SCE Metro - Summer Peak with Renewables**



**Post-Transient Voltage Deviations**

| ID        | Substation | Worst Contingency                  | Category | Category Description | Post Cont. Voltage Deviation % |                  |                  | Potential Mitigation Solutions |
|-----------|------------|------------------------------------|----------|----------------------|--------------------------------|------------------|------------------|--------------------------------|
|           |            |                                    |          |                      | 2014 Summer Peak               | 2017 Summer Peak | 2022 Summer Peak |                                |
| MTR-PTR-1 | N/A        | Loss of Lugo 500/230 kV Substation | D        | Substation           | diverge                        | diverge          | diverge          | under review                   |

**Post-Transient Voltage Deviations**

| ID        | Substation | Worst Contingency                  | Category | Category Description | Post Cont. Voltage Deviation % |                      |     | Potential Mitigation Solutions |
|-----------|------------|------------------------------------|----------|----------------------|--------------------------------|----------------------|-----|--------------------------------|
|           |            |                                    |          |                      | 2014 Summer Light Load         | 2017 Spring Off-Peak | N/A |                                |
| MTR-PTR-2 | N/A        | Loss of Lugo 500/230 kV Substation | D        | Substation           | N/A                            | diverge              |     | under review                   |

## 2012/2013 ISO Reliability Assessment - Preliminary Study Results

Study Area: **SCE Metro**



### Single Contingency Load Drop

| ID | Worst Contingency | Category | Category Description | Amount of Load Drop (MW) |      |      | Potential Mitigation Solutions |
|----|-------------------|----------|----------------------|--------------------------|------|------|--------------------------------|
|    |                   |          |                      | 2014                     | 2017 | 2022 |                                |
|    |                   |          |                      |                          |      |      |                                |

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

2012/2013 ISO Reliability Assessment - Preliminary Study Results

Study Area: **SCE Metro**



*Single Source Substation with more than 100 MW Load*

| ID | Substation | Load Served (MW) |      |      | Potential Mitigation Solutions |
|----|------------|------------------|------|------|--------------------------------|
|    |            | 2014             | 2017 | 2022 |                                |
|    |            |                  |      |      |                                |

No single source substation with more than 100 MW Load