# 2016 and 2020 Draft LCR Study Results San Diego-Imperial Valley

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Stakeholder Meeting

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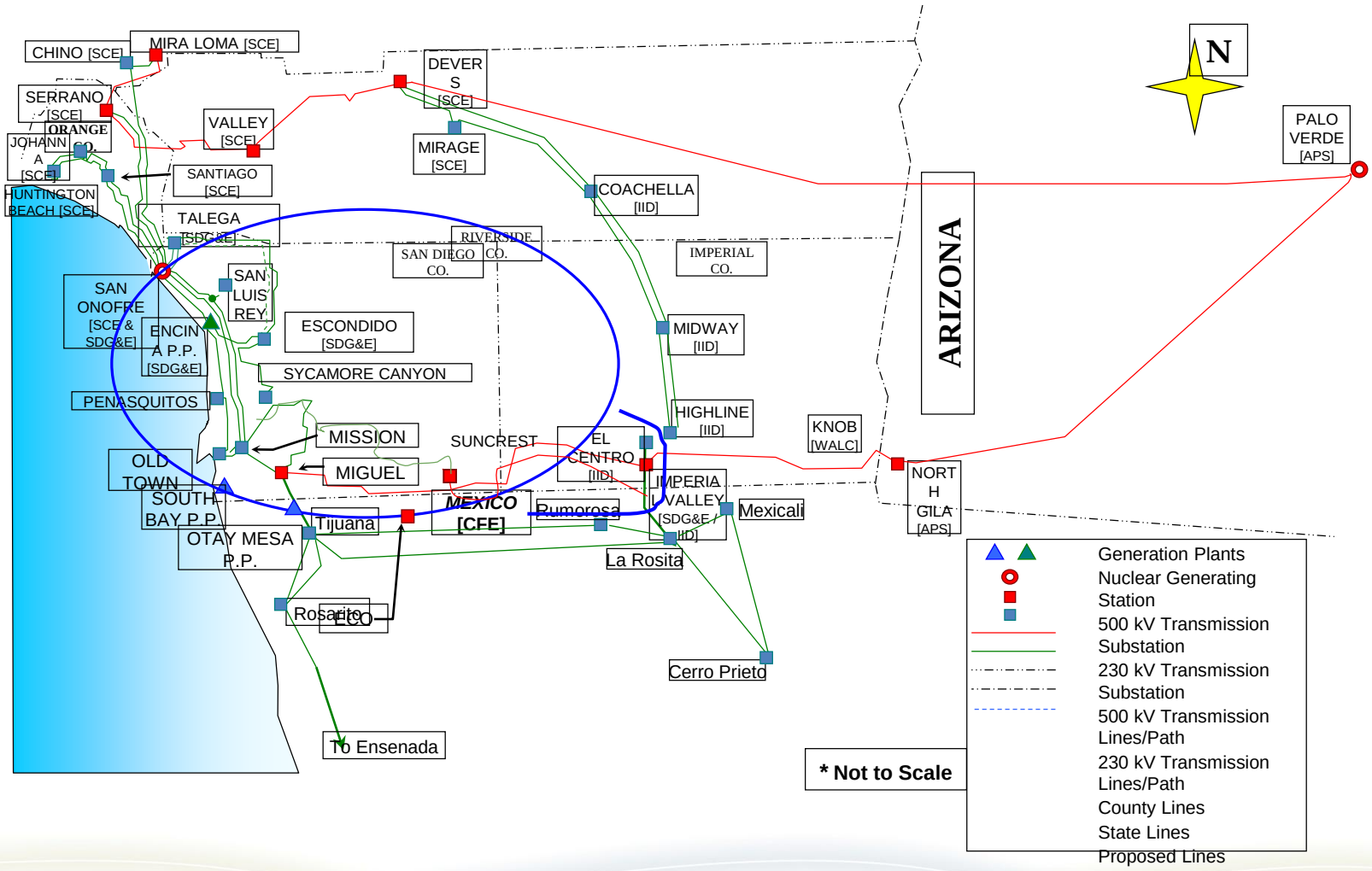
# San Diego-Imperial Valley LCR Area



# San Diego-Imperial Valley Area Load and Resources

| | | **2016** | **2020** |
|---|---|---|---|
| Load | = | 5,206 | 5,450 |
| AAEE | = | -81 | -216 |
| Transmission Losses | = | 158 | 178 |
| Total Area Load | = | **5,283** | **5,412** |
| Market Generation | = | 4,364 | 4,324 |
| Muni Generation | = | 0 | 0 |
| Wind Generation | = | 55 | 55 |
| QF Generation | = | 164 | 164 |
| Total Qualifying Capacity | = | **4,583** | **4,543** |

# Major New Upgrades Modeled

## 2016 Base Case

1. Reconductor of Los Coches–Loveland 69 kV line
2. Miguel-Otay Mesa-South Bay-Sycamore 230 kV re-configuration
3. Reactor on TL23040 Otay Mesa-Tijuna 230 kV line with 850 MVA emergency rating
4. Talega Synchronous Condenser (2x225 Mvar)
5. San Luis Rey Synchronous Condenser (2x225 Mvar)
6. 2nd Encina 230/138 Bank #61
7. East County 500kV Substation (ECO)
8. Reconductor of San Lius Rey-Oceanside Tap 69 kV line
9. 2nd Hassayampa-North Gila 500 kV line
10. Imperial Valley – Dixieland 230 kV tie with IID
11. IV-Libert-FERN 230 kV tie re-configuration
12. Pio Pico Power Plant

# Major New Upgrades Modeled

## 2020 Base Case

1. TL632 Granite Loop-In and TL6914 reconfiguration
2. A new Sycamore – Bernardo 69 kV line
3. Reconductor Bernardo-Rancho Carmel 69 kV line
4. Reconductor of Sycamore – Chicarita 138 kV line
5. Sycamore-Penasquitos 230 kV line
6. Artesian 230/69 kV Sub and loop-in
7. Imperial Valley Flow Controller on TL23050 Tie with CFE
8. Encina Plant retirement
9. Kearny retirement
10. El Cajon GT retirement
11. Miramar GT retirement
12. Encina Repower Project

# Areas and sub-areas studied:

- El Cajon sub-area
- Mission sub-area
- Esco sub-area
- Pala sub-area
- Miramar sub-area
- Border sub-area
- San Diego sub-area
- San Diego-Imperial Valley area

# El Cajon Sub-area Critical Contingencies

## Category B:

Contingency: loss of Miguel-Granite-Los Coches 69 kV (TL632) with one El Cajon unit out of service.

Limiting component: El Cajon-Los Coches 69 kV (TL631) overloaded

2016 LCR need: 65 MW (includes 0 MW of QF generation)

2020: no requirement due to TL632 Granite Loop-In and TL6914 reconfiguration

## Category C:

Contingency: loss of El Cajon-Jamacha 69 kV (TL624) followed by the loss of Miguel – Granite – Los Coches 69 kV (TL632) or vice versa

Limiting component: El Cajon-Los Coches 69 kV (TL631) overloaded

2016 LCR need: 109 MW (includes 0 MW of QF generation and 15 MW deficiency)

Contingency: loss of El Cajon-Jamacha 69 kV (TL624) followed by loss of Murray-Garfield 69 kV (TL620) or vice versa

Limiting component: El Cajon-Los Caches 69 kV (TL631) overloaded

2020 LCR: 30 MW (includes 0 MW of QF generation)

# Mission Sub-area Critical Contingency

**Category C:**

Contingency: Loss of Mission-Kearny 69 kV (TL663) followed by the loss of Mission-Mesa Heights 69kV (TL676)

Limiting component: Clairmont-Clairmont Tap 69 kV section overloads

2016 LCR: 54 MW (includes 4 MW of QF and 50 MW of deficiency)

2020 LCR: 59 MW (includes 4 MW of QF and 55 MW of deficiency)

**Category B:**

No requirement.

# Esco Sub-area Critical Contingency

## Category C:

**2016 LCR:**

Contingency: loss of Poway-Pomerado 69 kV (TL6913) followed by loss of Esco-Escondido 69kV (TL6908)

Limiting component: Bernardo-Felicita Tap 69kV (TL689) overloaded

LCR need: 110 MW (includes 38 MW of QF generation and 72 MW deficiency)

**2020 LCR :** 0 MW due to the 2nd Poway-Pomerado 69 kV line

## Category B:

No requirement.

# Pala Sub-area Critical Contingency

**Category C:**

Contingency: loss of Pendleton-San Luis Rey 69 kV line (TL6912) followed by loss of Lilac-Pala 69kV (TL6908)

Limiting component: Melrose-Morro Hill Tap 69kV (TL694) overloaded

2016 LCR need: 35 MW (includes 0 MW of QF generation)

2020 LCR need: 43 MW (includes 0 MW of QF generation)

**Category B:**

No requirement.

# Border Sub-area Critical Contingency

**Category C:**

Contingency: loss of Bay Boulevard-Otay 69 kV #1 (TL645) followed by loss of Bay Boulevard-Otay 69 kV #2 (TL646)

Limiting component: Imperial Beach-Bay Boulevard 69 kV (TL647) overloaded

2016 LCR: 66 MW (includes 25 MW of QF generation)

2020 LCR: 67 MW (includes 25 MW of QF generation)

**Category B:**

No requirement.

# Miramar Sub-area Critical Contingencies

## Category C:

Contingency: loss of Otay Mesa-Miguel Tap-South Bay 230 kV (TL23042) followed by outage of Sycamore-Palomar 230 kV Line (2016)

loss of Miguel-South Bay 230 kV (TL23042) followed by outage of Sycamore-Penasquitos 230 kV Line (2020)

Limiting component: Sycamore-Scripps 69 kV (TL6916) overloaded

2016 LCR: 96 MW (includes 0 MW of QF)

2020 LCR: 142 MW (includes 0 MW of QF and 46 MW of deficiency)

## Category B:

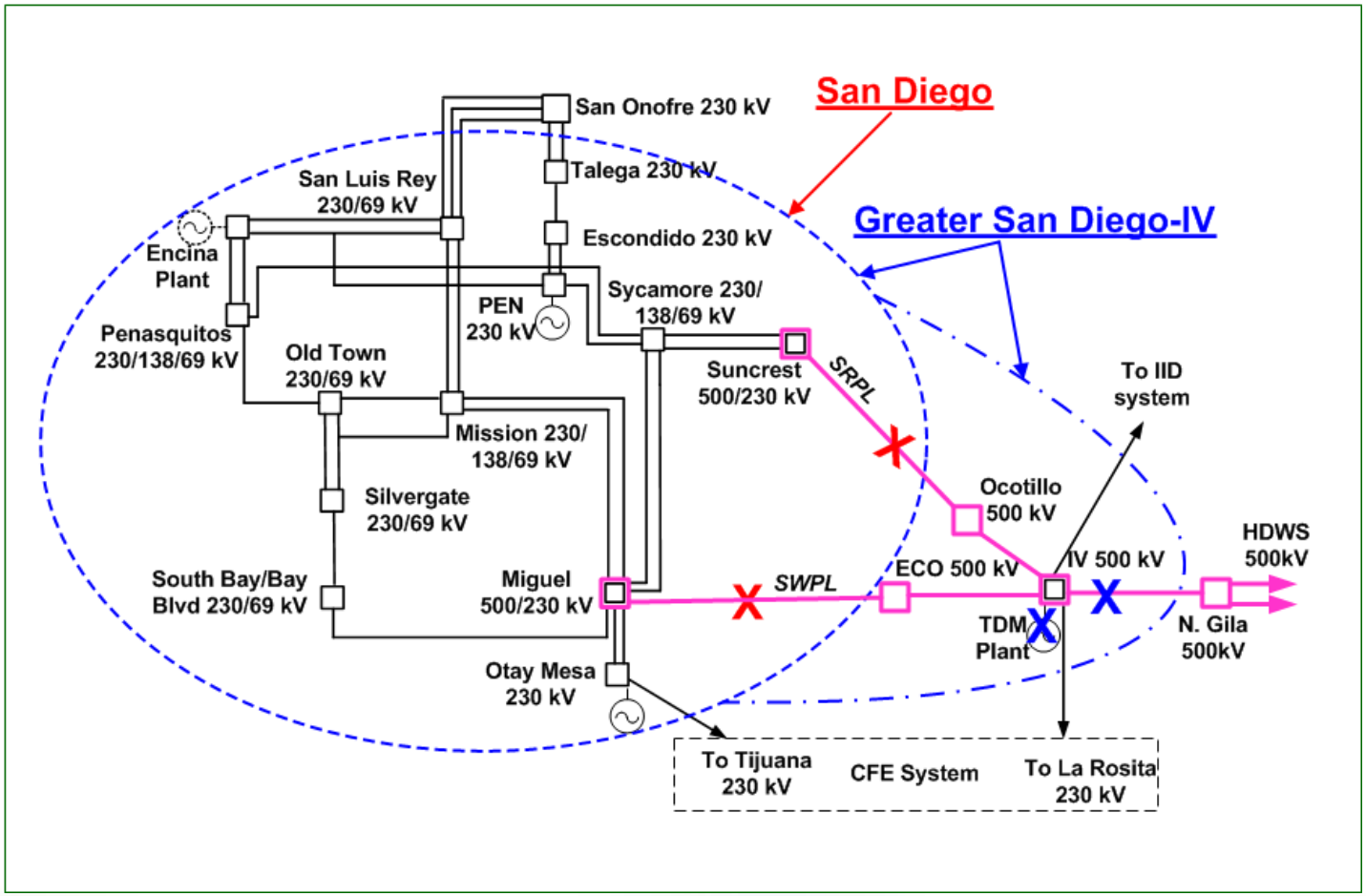
Contingency: loss of Otay Mesa-Miguel Tap-South Bay(Miguel-South Bay) 230 kV (TL23042) overlapping with Miramar Energy Facility unit #1 or #2

Limiting component: Sycamore-Scripps 69 kV (TL6916) overloaded

2016 LCR: 85 MW (includes 0 MW of QF)

2020 LCR: 45 MW (includes 0 MW of QF) after completion of the Miramar-Mesa Rim 69 kV System Reconfiguration

# San Diego Sub-area and San Diego-Imperial Valley Area



# San Diego Sub-area Critical Contingency

## Category C:

Contingency: Loss of Ocotillo–Suncrest 500kV line followed by loss of ECO-Miguel 500kV line, or vise versa

Limiting component: post-transient instability in the LA Basin & San Diego areas

2016 LCR: 3,250 MW (includes 164 MW of QF and 9 MW of wind generation, and no deficiency/surplus)

2020 LCR: Same as Category B

## Category B:

Contingency: Otay Mesa Plant already out of service followed by loss of ECO-Miguel 500kV line outage

Limiting component: Suncrest-Sycamore 230 kV lines (TL23054/TL23055)

2016 LCR: 2,610 MW (includes 164 MW of QF and 9 MW of wind)

2020 LCR: 2,868 MW (includes 164 MW of QF and 9 MW of wind)

# Greater San Diego-Imperial Valley Area Critical Contingencies

**Category C:**

2016 LCR need: Same as Category B – Non binding

2020 LCR need: Same as Category B – Non binding

**Category B:**

Contingency: Otay Mesa plant out of service followed by loss of IV-N.Gila 500 kV line (TL50002)

Limiting component: post-voltage instability in the SDGE-IV area

2016 LCR need: 2,850 MW (includes 164 MW of QF and 55 MW of Wind)

2020 LCR need: Non binding

# San Diego – Imperial Valley Area LCR

| Available Generation | Qualifying Capacity | Wind | Market | Max Qualified Capacity |
|---|---|---|---|---|
| | MW | MW | MW | MW |
| 2016 | 164 | 55 | 4364 | 4583 |
| 2020 | 164 | 55 | 4324 | 4543 |

| Study Year | Contingency Type | Generation Capacity Needed | Deficiency | Total LCR |
|---|---|---|---|---|
| | | MW | MW | MW |
| 2016 | Category B (Single) | 2850 | 0 | 2850 |
| | Category C (Multiple) | 3250 | 137 | 3387 |
| 2020 | Category B (Single) | 2868 | 0 | 2868 |
| | Category C (Multiple) | 2868 | 101 | 2969 |

# Changes

**2016 LCR compared to 2015:**

- Net load forecast went down by 124 MW
- Overall LCR need reduced by 725 MW in 2016 mostly due to the dynamic reactive support facility added at San Luis Rey and other network upgrades in the areas

**2020 LCR compared to 2019:**

- Net load forecast decreased by 126 MW
- Overall LCR need reduced by 321 MW mainly due to the dynamic reactive support facilities to be installed at San Luis Rey, San Onofre, and Santiago, along with other scheduled network upgrades in the areas

**Your comments and questions are welcome**

**For written comments, please send to: RegionalTransmission@caiso.com**