2017 Final LCR Study Results
San Diego-Imperial Valley

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Stakeholder Call

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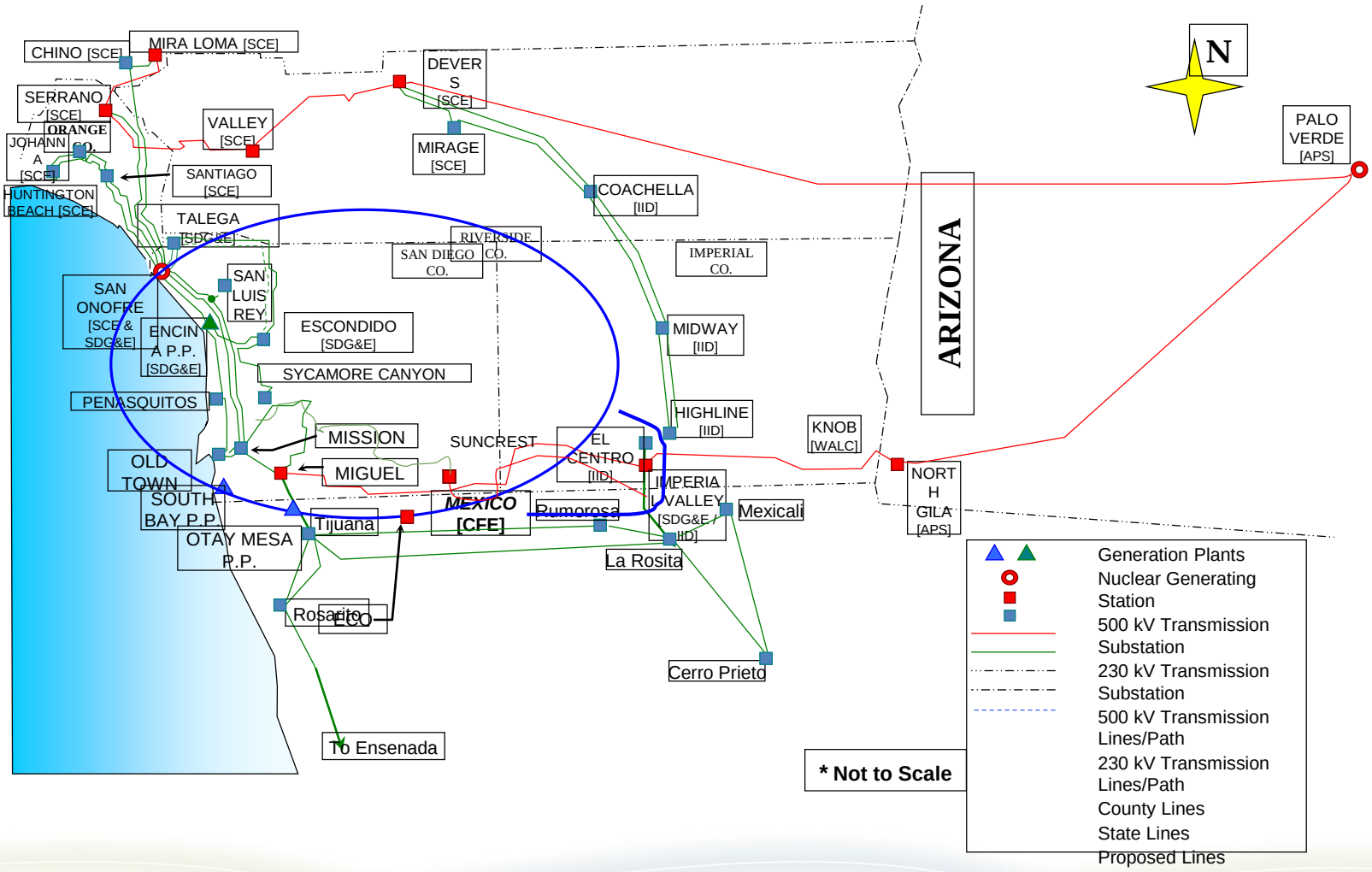
San Diego-Imperial Valley LCR Area



San Diego-Imperial Valley Area Load and Resources

		2017
Load	=	4,760
AAEE	=	-84
Transmission Losses	=	164
Total Area Load	=	**4,840**
Market Generation	=	5,071
Muni Generation	=	0
Wind Generation	=	136
QF Generation	=	103
Total Qualifying Capacity	=	**5,310**

Major New Upgrades Modeled

1. Reactor on TL23040 Otay Mesa-Tijuna 230 kV line with 850 MVA emergency rating
2. Miguel Synchronous Condensers (2x225 Mvar)
3. 2nd Encina 230/138 Bank #61
4. East County 500kV Substation (ECO)
5. Reconductor of San Lius Rey-Oceanside Tap 69 kV line
6. IV Tertiary Reactors
7. Reconductor of Mission-Mesa Heights 69 kV line
8. Reconductor of Kearny-Mission 69 kV line
9. Imperial Valley Phase Shifting Transformers
10. By-passing 500 kV series capacitor banks on SWPL and SPL
11. 2nd Hassayampa-North Gila 500 kV line
12. A few new solar generation modeled in the IV area
13. A few new wind generation modeled in the Ocotillo and ECO areas
14. Pio Pico Power Plant

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 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

2017 LCR need: 62 MW (includes 0 MW of QF generation)

Category B:

No requirement.

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

2017 LCR: 22 MW (includes 0 MW of QF)

Category B:

No requirement.

Esco Sub-area Critical Contingency

Category C:

2017 LCR:

Contingency: loss of anyone of the two Sycamore-Pomerado 69 kV (TL6915 or TL6924) followed by loss of Esco-Escondido 69kV (TL6908)

Limiting component: Other Sycamore-Pomerado 69 kV (TL6924 or TL6915) overloaded

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

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

2017 LCR need: 21 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

2017 LCR: 27 MW (includes 2 MW of QF generation)

Category B:

No requirement.

Miramar Sub-area Critical Contingencies

Category C:

2017 Contingency: loss of Miguel-Silvergate 230 kV followed by outage of Sycamore-Palomar 230 kV line

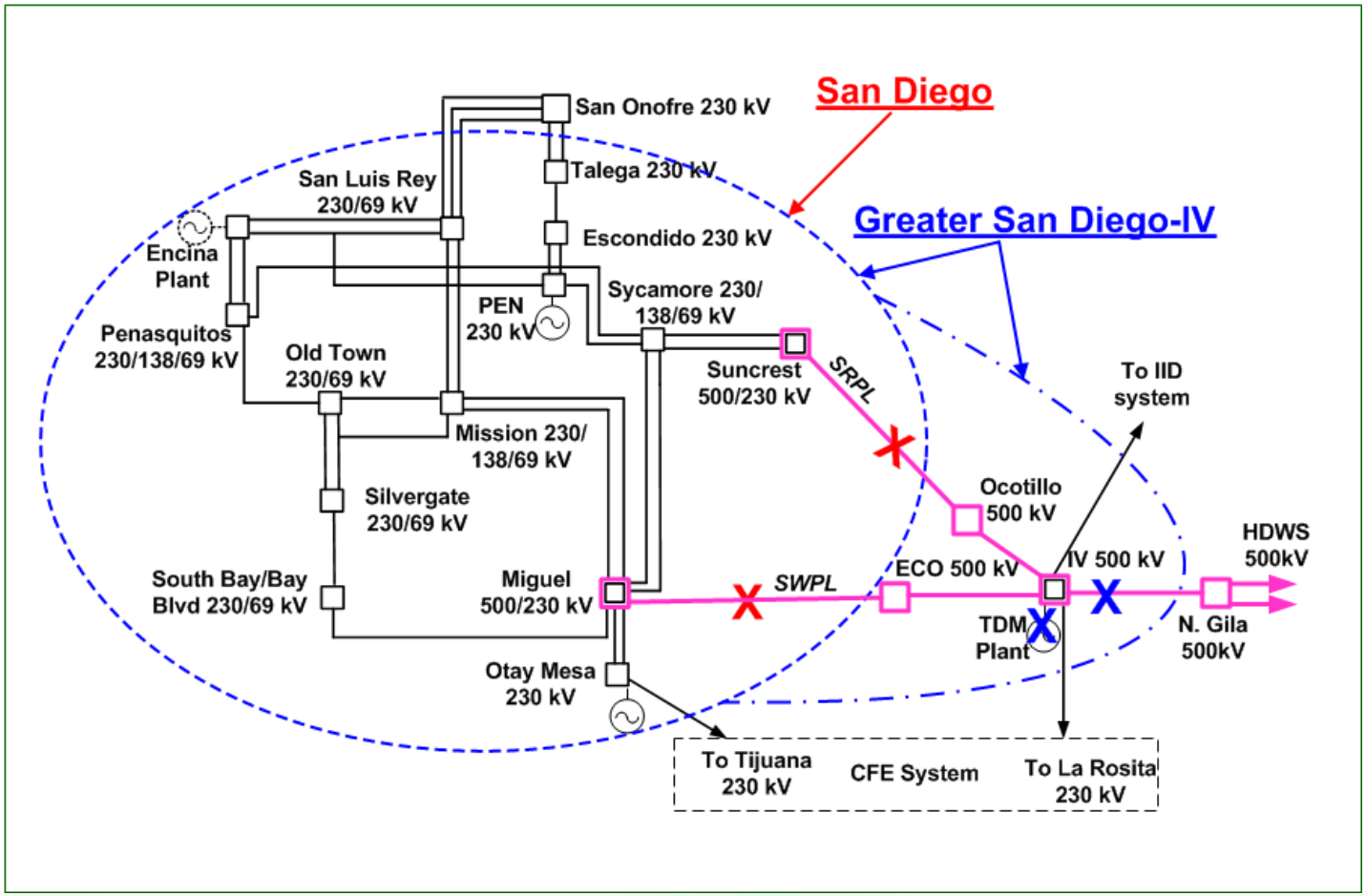
Limiting component: Sycamore-Scripps 69 kV (TL6916) overloaded

2017 LCR: 75 MW (includes 0 MW of QF)

Category B:

No requirement.

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



San Diego Sub-area Critical Contingencies

Category C

Under current and anticipated Aliso Canyon gas storage constraints, San Diego sub-area shares the same critical electric transmission constraint as the LA Basin as local resource needs are balanced with the San Diego area to help relieve the generation needs in the LA Basin which are directly affected by Aliso Canyon.

Contingency: Sylmar-Gould 230 kV line followed by Lugo-Victorville 500 kV line

Limiting component: Sylmar-Eagle Rock 230 kV line

2017 LCR Need: 10,283 MW

LA Basin: 7,368 MW (includes 1,615 MW of QF, wind and Muni generation)

San Diego subarea: 2,915 MW (includes 108 MW of QF and wind generation)

Category C – voltage instability sensitivity

Contingency: ECO-Miguel 500kV line followed by Ocotillo-Suncrest 500 kV line

This overlapping contingency could result in voltage stability concerns under a sensitivity scenario with less contribution from rooftop solar PV during the hour of 6:00 PM when customer demand remains high and where key static shunt capacitor switching does not occur in a timely manner following the second contingency.

San Diego Sub-area Critical Contingencies

Category B

Contingency: Sylmar-Gould 230 kV line out with Redondo #7 out of service

Limiting component: Sylmar-Eagle Rock 230 kV line

2017 LCR Need: 8,929 MW

LA Basin: 6,873 MW (includes 1,615 MW of QF, Muni, and Wind)

San Diego subarea: 2,056 MW (includes 108 MW of QF and wind generation)

Greater San Diego-Imperial Valley Area Critical Contingencies

Category C:

2017 LCR need: 3,570 MW (Same as Category B)

Category B:

Contingency: TDM power plant in NQC size of 593 MW out of service followed by loss of IV-N.Gila 500 kV line (TL50002)

Limiting component: S-Line overloaded

2017 LCR need: 3,570 MW (includes 103 MW of QF and 136 MW of Wind)

San Diego – Imperial Valley Area LCR

Available Generation	Qualifying Capacity	Wind	Market	Max Qualified Capacity
	MW	MW	MW	MW
2017	103	136	5071	5310

Study Year	Contingency Type	Generation Capacity Needed	Deficiency	Total LCR
		MW	MW	MW
2017	Category B (Single)	3570	0	3570
	Category C (Multiple)	3570	0	3570

Changes

Since last year:

- Net load forecast went down by 443 MW
- Overall LCR need increased by 386 MW in 2017. This increase occurs in the Imperial Valley area and is mostly due to cancellation of previously planned upgrade projects connecting to the Imperial Valley 230 kV substation

Since last stakeholder meeting:

- Updated NQC
- Increase need in the San Diego sub-area due to Aliso Canyon gas storage constraints and sensitivity study concerns as well as delay in the San Luis Rey synchronous condenser in-service date.

Your comments and questions are welcome

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