2016 and 2020 Final LCR Study Results San Diego-Imperial Valley

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Stakeholder Teleconference

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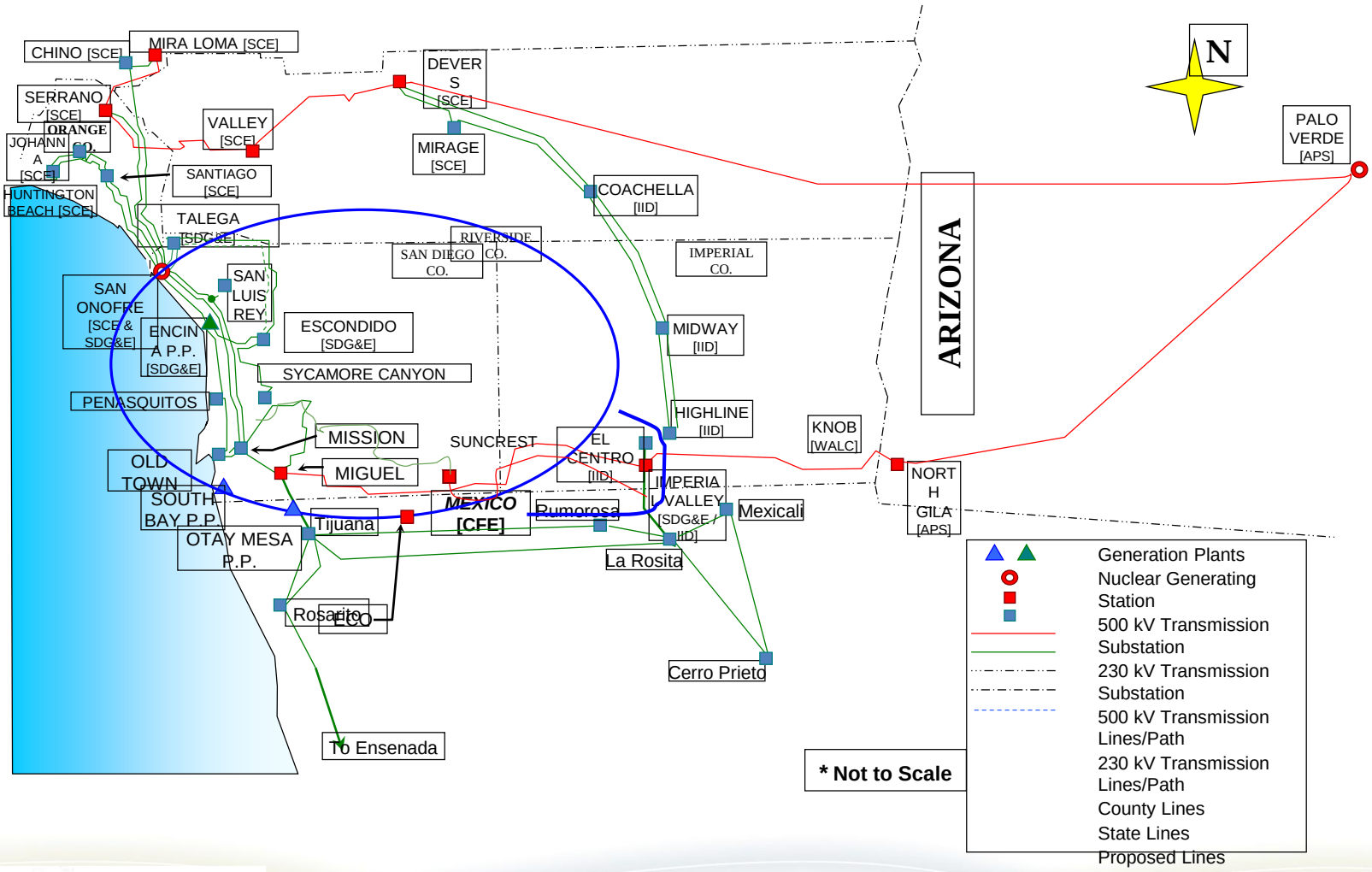
San Diego-Imperial Valley LCR Area



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	=	4,687	4,493
Muni Generation	=	0	0
Wind Generation	=	87	142
QF Generation	=	141	141
Total Qualifying Capacity	=	**4,915**	**4,776**

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. 2nd Encina 230/138 Bank #61
6. East County 500kV Substation (ECO)
7. Reconductor of San Lius Rey-Oceanside Tap 69 kV line
8. 2nd Hassayampa-North Gila 500 kV line
9. Imperial Valley – Dixieland 230 kV tie with IID
10. IV-Libert-FERN 230 kV tie re-configuration
11. Pio Pico Power Plant

Major New Upgrades Modeled

2020 Base Case

1. TL632 Granite Loop-In and TL6914 reconfiguration
2. San Luis Rey Synchronous Condenser (2x225 Mvar)
3. A new Sycamore – Bernardo 69 kV line
4. Reconductor Bernardo-Rancho Carmel 69 kV line
5. Reconductor of Sycamore – Chicarita 138 kV line
6. Sycamore-Penasquitos 230 kV line
7. Artesian 230/69 kV Sub and loop-in
8. Imperial Valley Flow Controller on TL23050 Tie with CFE
9. Encina Plant retirement
10. Kearny retirement
11. El Cajon GT retirement
12. Miramar GT retirement
13. 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)

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 0 MW of QF)

2020 LCR: 56 MW (includes 0 MW of QF)

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 3 MW of QF generation)

2020 LCR: 67 MW (includes 3 MW of QF generation)

Category B:

No requirement.

Miramar Sub-area Critical Contingencies

Category C:

2016 Contingency: loss of Miguel-Silvergate 230 kV followed by outage of Sycamore-Palomar 230 kV line

2020 Contingency: loss of Miguel-Bay Boulevard 230 kV followed by outage of Sycamore-Penasquitos 230 kV line

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

2016 LCR: 118 MW (includes 0 MW of QF)

2020 LCR: 142 MW (includes 0 MW of QF and 10 MW of deficiency)

Category B:

2016 Contingency: loss of Miguel-Silvergate 230 kV overlapping with Miramar Energy Facility unit #1 or #2

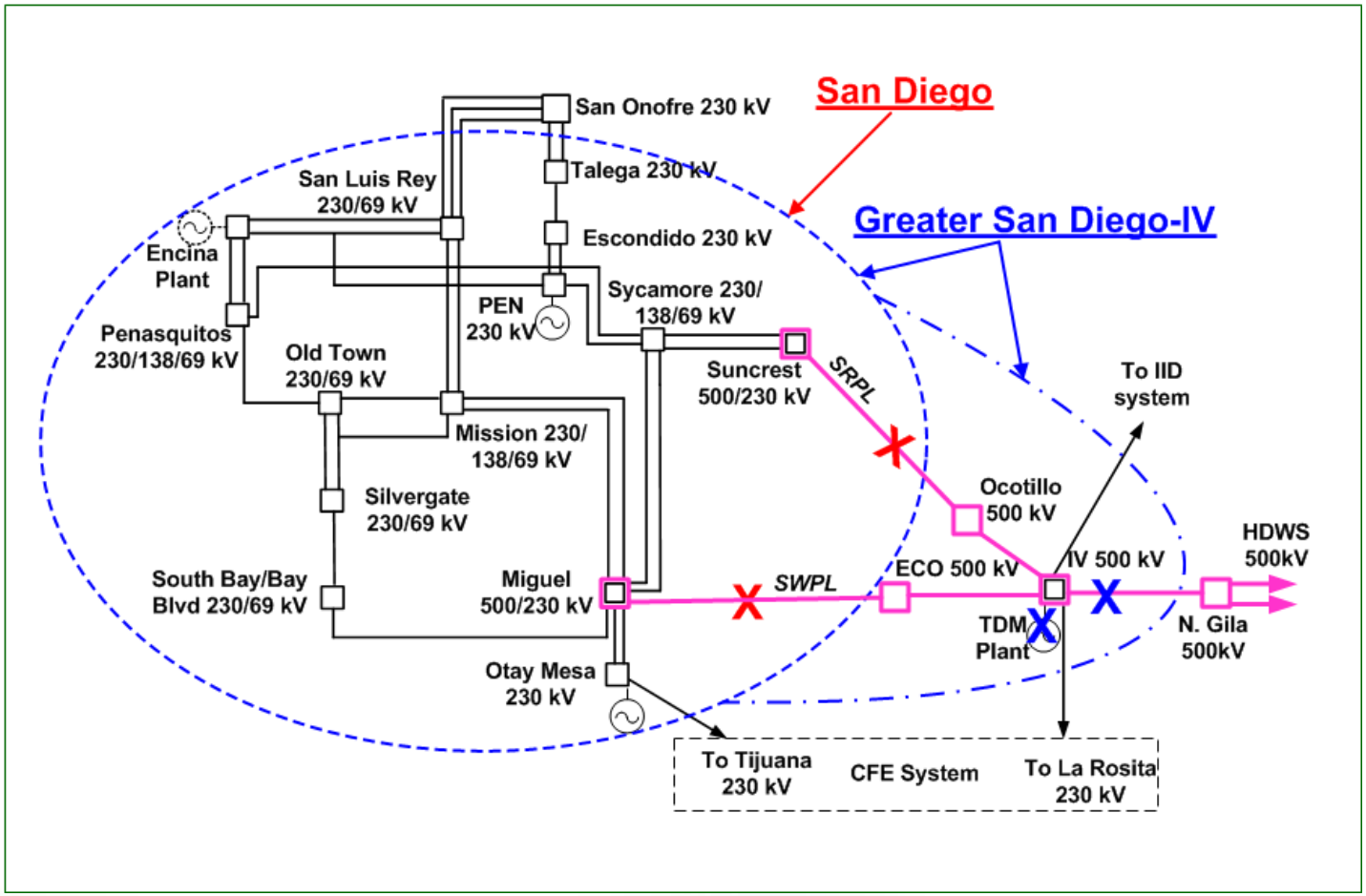
2020 Contingency: loss of Sycamore-Penasquitos 230 kV overlapping with Miramar Energy Facility unit #1 or #2

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

2016 LCR: 82 MW (includes 0 MW of QF)

2020 LCR: 68 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: 3,112 MW (includes 141 MW of QF and 5 MW of wind generation)

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 141 MW of QF and 5 MW of wind)

2020 LCR: 2,868 MW (includes 141 MW of QF and 5 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 141 MW of QF and 87 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	141	87	4687	4915
2020	141	142	4493	4776

Study Year	Contingency Type	Generation Capacity Needed	Deficiency	Total LCR
		MW	MW	MW
2016	Category B (Single)	2850	0	2850
	Category C (Multiple)	3112	72	3184
2020	Category B (Single)	2868	0	2868
	Category C (Multiple)	2868	10	2878

Changes

2016 LCR compared to 2015:

- Net load forecast went down by 124 MW
- Overall LCR need reduced by 928 MW in 2016 mostly due to the dynamic reactive support facility added and other network upgrades in the areas as well as decrease in load forecast

2020 LCR compared to 2019:

- Net load forecast decreased by 126 MW
- Overall LCR need reduced by 412 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 as well as decrease in load forecast

Since last stakeholder meeting:

- Updated NQC
- San Luis Rey SC (2x225 Mvar) in service after June 1, 2016
- Small changes to LCR needs in Mission, Miramar and San Diego sub-areas

Your comments and questions are welcome

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