2015 and 2019 Draft LCR Study Results San Diego-Imperial Valley

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Stakeholder Web Conference

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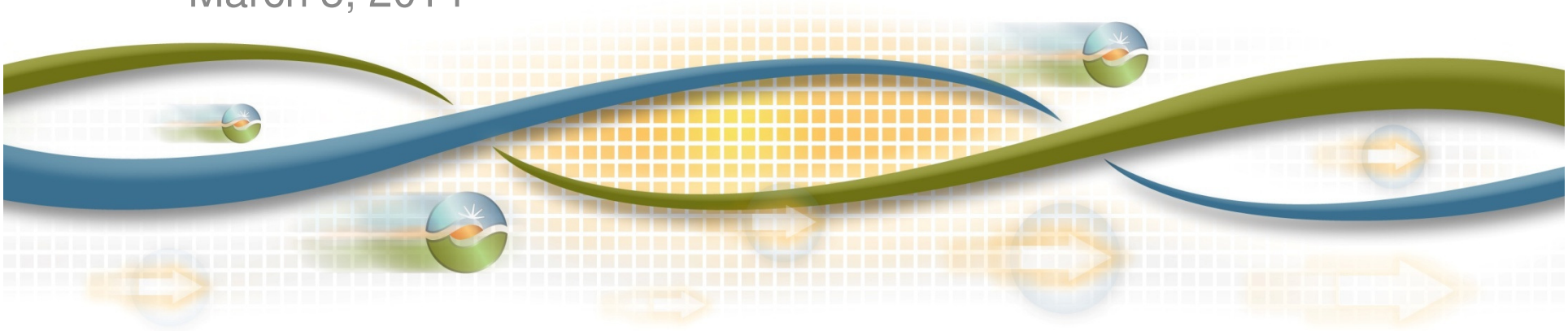
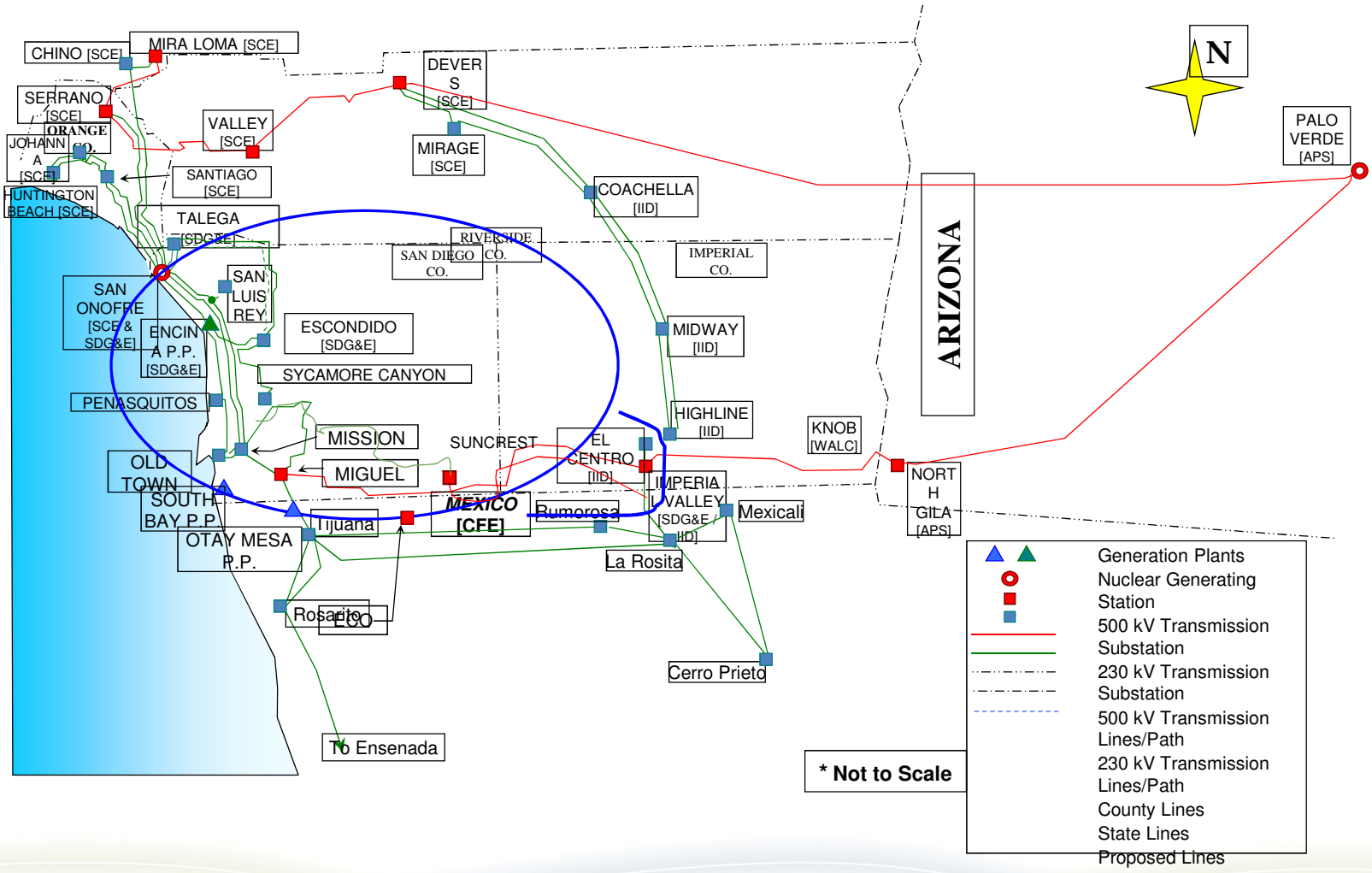


San Diego-Imperial Valley LCR Area



San Diego-Imperial Valley Area Load and Resources

		2015	2019
Load	=	5,244	5,331
Transmission Losses	=	163	207
Total Area Load	=	**5,407**	**5,538**
Market Generation	=	4,686	5,934
Muni Generation	=	0	0
Wind Generation	=	56	100
QF Generation	=	162	162
Total Qualifying Capacity	=	**4,904**	**6,196**

Major New Transmission Upgrades Modeled

2015 Base Case

1. SONGS Retirement
2. East County 500kV Substation (ECO)
3. Talega Synchronous Condenser (2x225 Mvar)
4. Reconductor of El Cajon – Los Coches 69 kV line
5. Reconductor of Mission – Clairmont 69 kV line
6. Reconductor of Mission – Kearny 69 kV line
7. Reconductor of Mission – Mesa Heights 69 kV line

Major New Transmission Upgrades Modeled

2019 Base Case

1. A new Sycamore – Bernardo 69 kV line
2. Reconductor Bernardo-Rancho Carmel 69 kV line
3. Reconductor of Sycamore – Chicarita 138 kV line
4. Sycamore-Penasquitos 230 kV line
5. Miguel-Otay Mesa-South Bay-Sycamore 230 kV re-configuration
6. New Pio Pico Power Plant
7. Kearny retirement
8. El Cajon GT retirement
9. Miramar GT retirement
10. Encina retirement
11. Assuming a phase shifter to be added at IV 230 kV substation

Areas and sub-areas studied

- El Cajon sub-area
- Mission sub-area
- Bernardo 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 loss of Miguel–Granite–Los Coches 69 kV (TL632) or vice versa

Limiting component: Garfield-Murray 69 kV (TL631) overloaded

2015 LCR: 50 MW (includes 0 MW of QF generation)

2019 LCR: 25 MW (includes 0 MW of QF generation)

Effectiveness factors:

All units within this sub-area (El Cajon Calpeak, El Cajon GT and El Cajon Energy Center) have the same effectiveness factor.

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: Kearny-Clairmont 69kV line (TL670) and Clairmont-Clairmont Tap 69 kV section overloads

2015 LCR: 43 MW (includes 3 MW of QF)

2019 LCR: 43 MW (includes 3 MW of QF and 40 MW of deficiency)

Effectiveness factors:

All units within this sub-area (Kearny and Mesa Hights) have the same effectiveness factor.

Category B:

No requirement.

Bernardo Sub-area Critical Contingency

Category C:

Contingency: Loss of Artesian-Sycamore 69 kV (TL6920) followed by loss of Poway-Rancho Carmel 69 kV (TL648)

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

2015 LCR: 160 MW (includes 0 MW of QF and 120 MW of deficiency)

2019 LCR: 0 MW due to the new Sycamore – Bernardo 69 kV line (TL6861) or the Artesian 230 kV substation Upgrade

Effectiveness factors:

Two units in this sub-area (Lake Hodges) have same effectiveness factor.

Category B:

No requirement.

Esco Sub-area Critical Contingency

Category C:

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

Limiting component: Bernardo-Rancho Carmel 69kV (TL633) overloaded

2015 LCR: 37 MW (includes 37 MW of QF generation)

2019 LCR: 0 MW (includes 37 MW of QF generation) due to the Bernardo-Rancho Carmel 69kV upgrade

Effectiveness factors:

All units in this sub-area (Goal line) have same effectiveness factor.

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

2015 LCR: 38 MW (includes 0 MW of QF generation)

2019 LCR: 50 MW (includes 0 MW of QF generation)

Effectiveness factors:

All units in this sub-area (Pala) have same effectiveness factor.

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

2015 LCR: 65 MW (includes 5 MW of QF generation)

2019 LCR: 60 MW (includes 5 MW of QF generation)

Category B:

No requirement.

Miramar Sub-area Critical Contingencies

Category C:

Contingency: loss of OtayMesa-MiguelTap-South Bay 230 kV (TL23042) followed by outage of Sycamore-Palomar 230 kV Line(2015)

loss of Miguel-South Bay 230 kV (TL23042) followed by outage of Sycamore-Penasquitos 230 kV Line (2019)

2015 LCR: 131 MW (includes 0 MW of QF)

2019 LCR: 140 MW (includes 0 MW of QF and 44 MW of deficiency)

Category B:

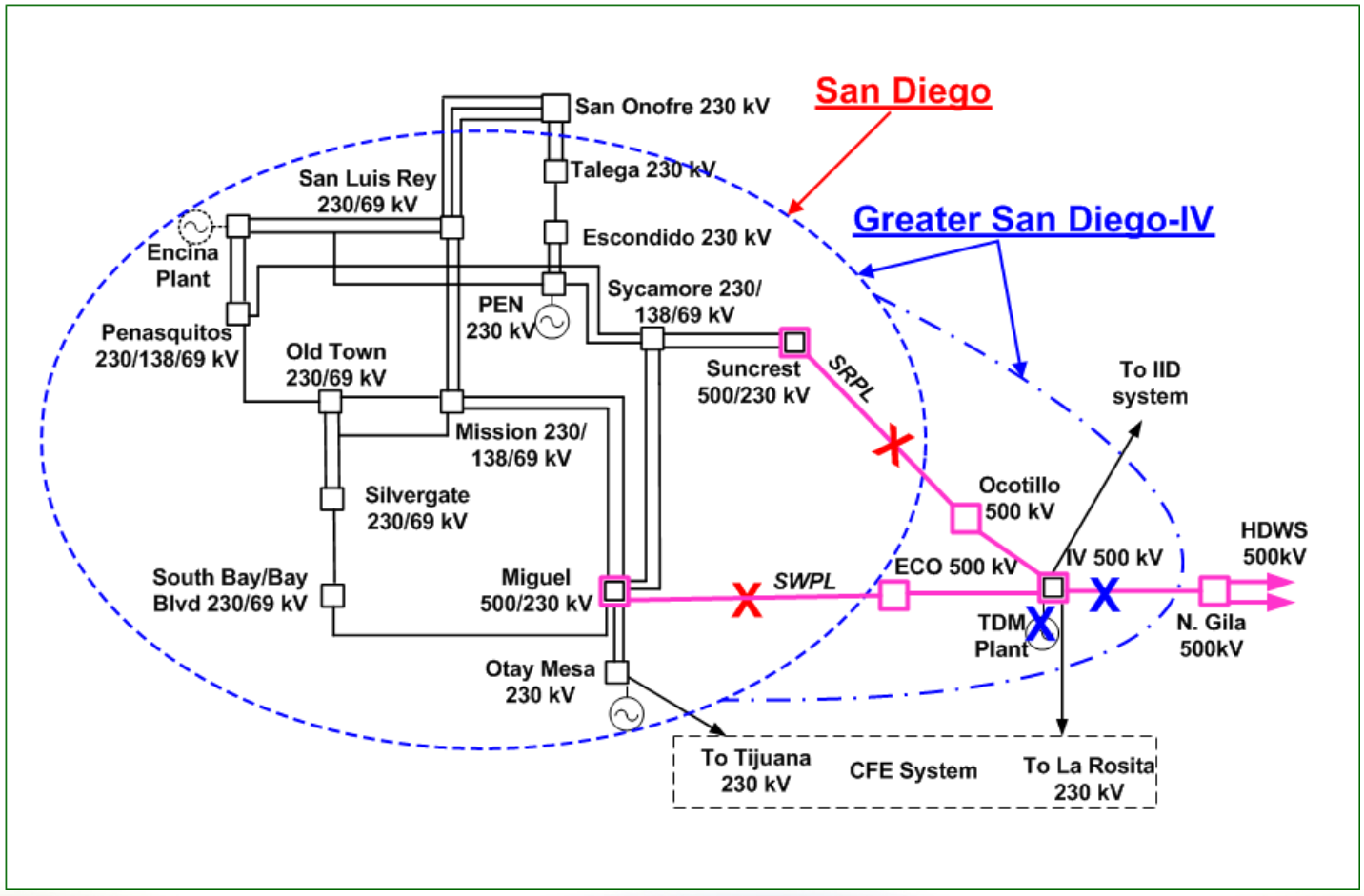
Contingency: loss of OtayMesa-MiguelTap-South Bay(Miguel-South Bay) 230 kV (TL23042) overlapping with Miramar Energy Facility unit #1 or #2

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

2015 LCR: 95 MW (includes 0 MW of QF and 0 MW of deficiency)

2019 LCR: 98 MW (includes 0 MW of QF and 3 MW of deficiency)

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 the loss of ECO-Miguel 500kV line

Limiting component: post-voltage Instability

2015 LCR: 3,176 MW (includes 162 MW of QF/Wind, and 98 MW of deficiency)

2019 LCR: 2,508 MW with the Phase Shifter at IV

(includes 262 MW of QF/Wind, and 272 MW of deficiency)

3,284 MW without the Phase Shifter at IV

(includes 262 MW of QF/Wind, and 1048 MW of deficiency)

Category B:

No requirement.

San Diego-Imperial Valley Area Critical Contingencies

Category C

Contingency: Loss of IV-N.Gila 500 kV line (TL50002) followed by TDM plant out of service

Limiting component: IV-El Centro 230 kV tie with IID (S-Line) overload

2015 LCR: 3,910 MW with 0 MW export from IID(includes 218MW of QF/Wind)

2019 LCR: 3,650 MW with the Phase Shifter at IV and 0 MW export from IID(includes 262 MW of QF/Wind)

Category B:

Contingency: TDM Plant out of service followed by loss of IV-N.Gila 500 kV line (TL50002)

Limiting component: IV-El Centro 230 kV tie with IID (S-Line) overload

2015 LCR: 3,910 MW with 0 MW export from IID(includes 218MW of QF/Wind)

2019 LCR: 3,650 MW with the Phase Shifter at IV and 0MW export from IID(includes 262 MW of QF/Wind)

San Diego – Imperial Valley Area LCR

Available Generation	Qualifying Capacity	Wind	Market	Max Qualified Capacity
	MW	MW	MW	MW
2015	162	56	4686	4904
2019	162	100	5934	6196

Study Year	Contingency Type	Generation Capacity Needed	Deficiency	Total LCR
		MW	MW	MW
2015	Category B (Single)	3910	0	3910
	Category C (Multiple)	3910	98	4008
2019	Category B (Single)	3650	0	3650
	Category C (Multiple)	3650	272	3922

Changes

2015 LCR compared to 2014:

- SONGS Retirement
- Load forecast went up by 171 MW.
- Overall LCR need decreased by 55 MW in 2015 due to Talega Synchronous Condensers and higher requirement in LA Basin

2019 LCR compared to 2018:

- Load forecast decreased by 166 MW
- Overall LCR need increased by 560 MW due to the S-Line overload for the G-1/L-1 outage

Your comments and questions are welcome

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