



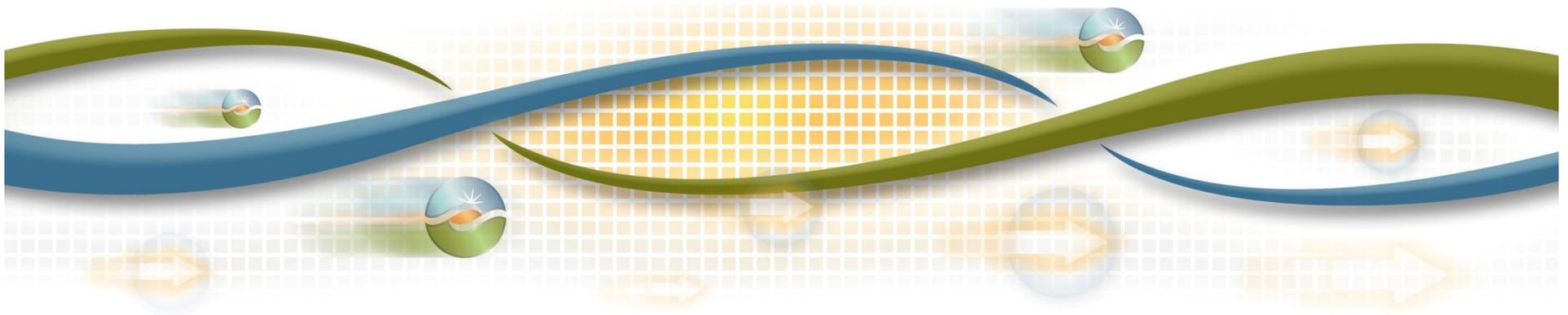
2015-2019 Draft LCR Study Results Sierra and Stockton Local Areas

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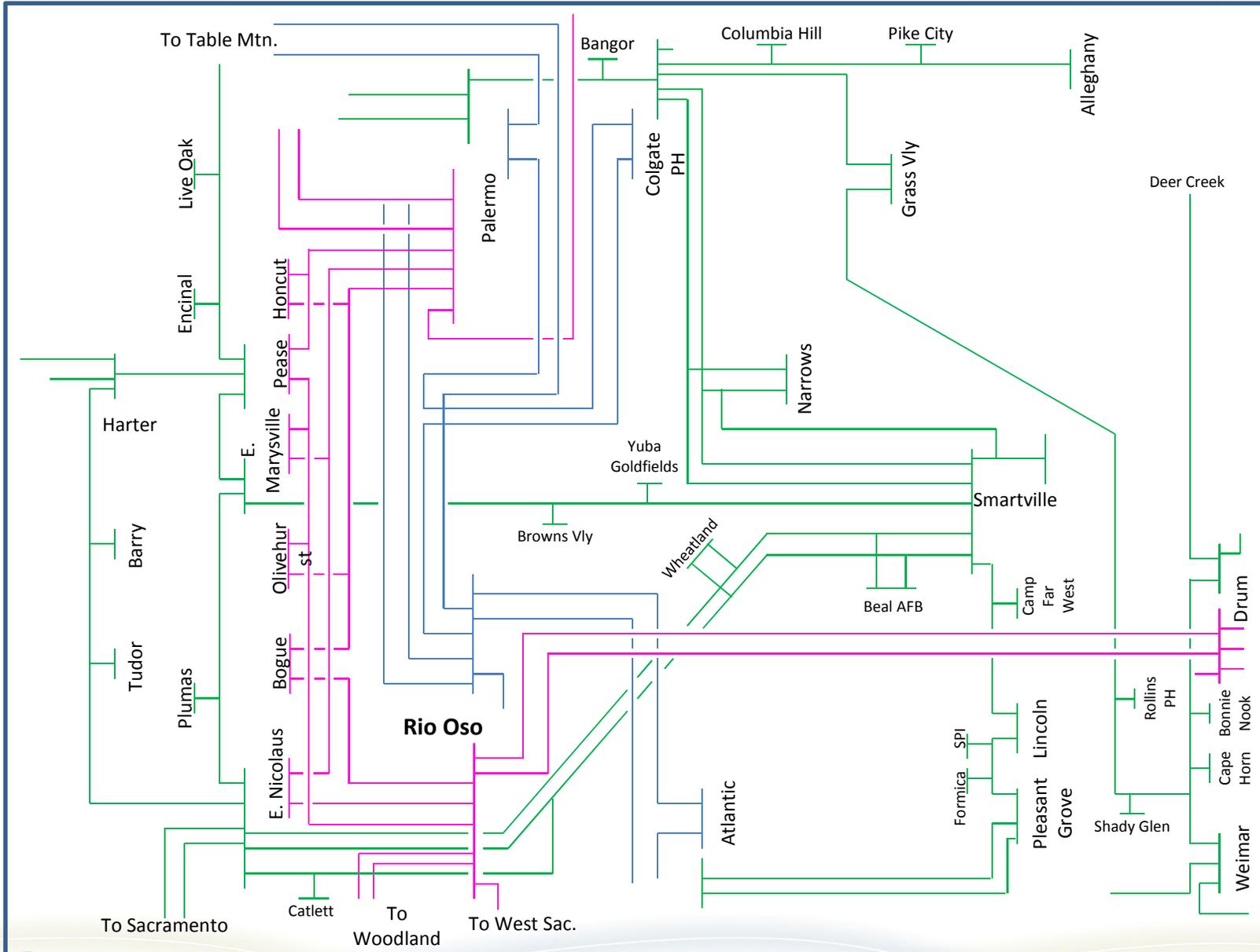
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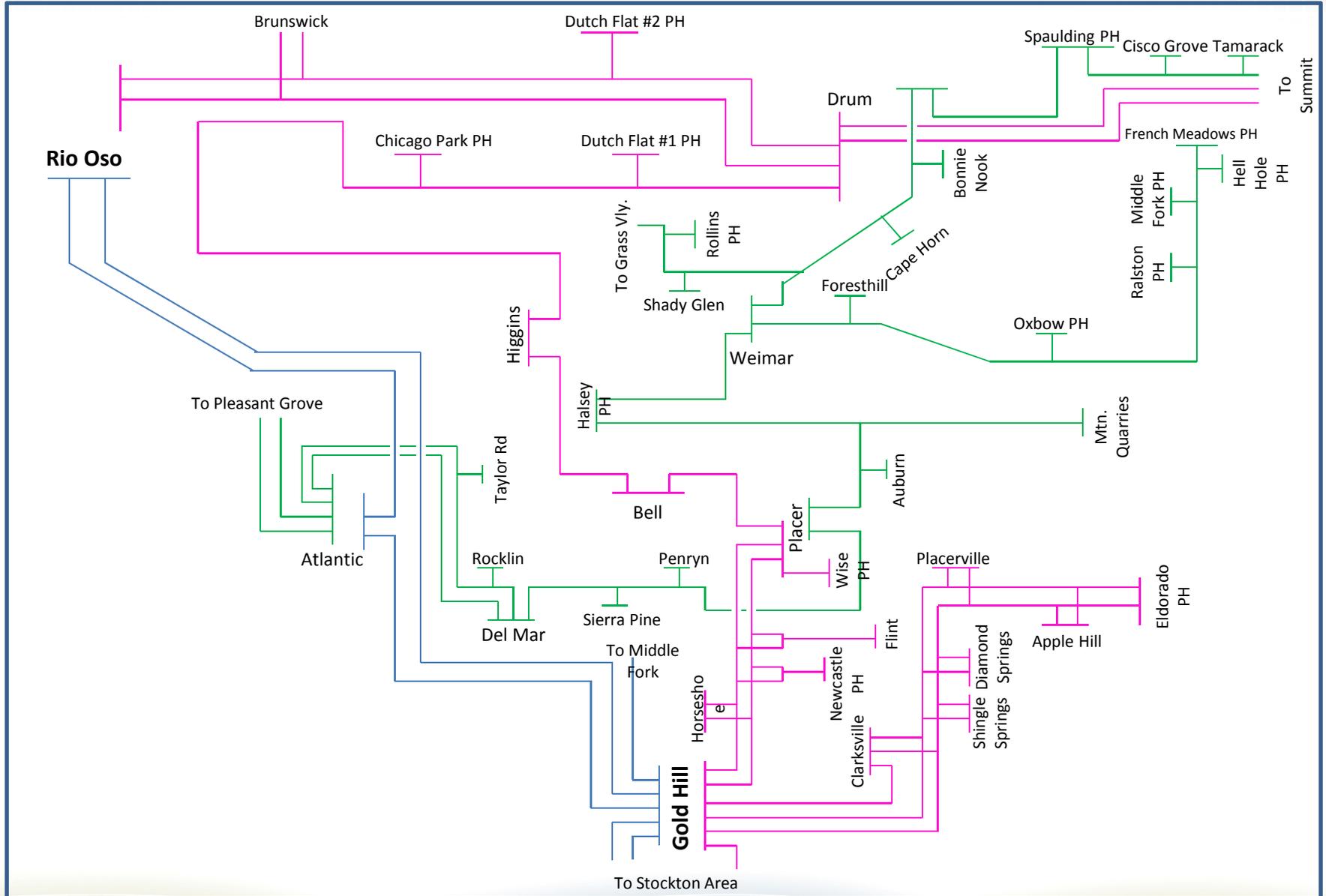
Sierra Area Load and Resources (MW)

		2015	2019
Load	=	1843	1976
Transmission Losses	=	118	100
Total Load	=	1961	2076
Market Generation	=	769	769
Muni Generation	=	1138	1138
QF Generation	=	226	226
Total Qualifying Capacity	=	2133	2133

Northern Sierra



Southern Sierra



New transmission projects modeled:

1. Palermo-Rio Oso 115 kV Reconductoring
2. Gold Hill-Missouri Flat #1 and #2 115 kV line Reconductoring (2019 only)
3. Rio Oso #1 and #2 230/115 kV Transformer Replacement (2019 only)
4. Vaca Dixon-Davis Voltage Conversion (2019 only)
5. New Rio Oso-Atlantic 230 kV line (2019 only)
6. South of Palermo 115 kV Reinforcement (2019 only)
7. New Atlantic-Placer 115 kV Line (2019 only)
8. Pease 115/60 kV Transformer Addition (2019 only)

Critical Sierra Area Contingencies South of Table Mountain

South of Table Mountain Sub-area – Category C

2015 LCR need: 1803 MW (includes 171 MW of QF and 1103 MW of Muni generation)

2019 LCR need: 1102 MW (includes 171 MW of QF and 1103 MW of Muni generation)

Contingency: Table Mountain-Rio Oso 230 kV and Table Mountain-Palermo 230 kV DCTL outage

Limiting component: Thermal overload on the Caribou-Palermo 115 kV line

South of Table Mountain Sub-area – Category B

2015: No additional category B requirement. Units required for South of Palermo satisfy the category B requirement for this sub-area.

2019 LCR need: 525 MW (includes 171 MW of QF and 1103 MW of Muni generation)

Contingency: Table Mountain-Rio Oso 230 kV line and Belden Unit

Limiting component: Thermal overload on the Table Mountain-Palermo 230 kV line

Critical Sierra Area Contingencies South of Palermo

South of Palermo Sub-area – Category C

2015 LCR need: 1727 MW (includes 59 MW of QF and 639 MW of Muni generation as well as 341 MW of deficiency)

Contingency: Double Circuit Tower Line Table Mountain-Rio Oso and Colgate-Rio Oso 230 kV lines

Limiting component: Thermal overload on the Pease-Rio Oso 115 kV line

2019: No requirement due to South of Palermo 115 kV Reinforcement project.

South of Palermo Sub-area – Category B

2015 LCR need: 1290 MW (includes 59 MW of QF and 639 MW of Muni generation)

Contingency: Palermo-E. Nicolaus 115 kV line with Belden unit out of service

Limiting component: Thermal overload on the Pease-Rio Oso 115 kV line

2019: No requirement due to South of Palermo 115 kV Reinforcement project.

Critical Sierra Area Contingencies

Drum-Rio Oso

Drum-Rio Oso Sub-area – Category C

2015 LCR need: 596 MW (includes 171 MW of QF and 198 MW of Muni generation)

Contingency: Rio Oso #2 230/115 kV transformer and Rio Oso-Brighton 230 kV line

Limiting component: Thermal overload on the Rio Oso #1 230/115 kV transformer

2019: No requirement due to Rio Oso Transformers Replacement project.

Drum-Rio Oso Sub-area – Category B

2015 LCR need: 220 MW (includes 171 MW of QF and 198 MW of Muni generation)

Contingency: Rio Oso # 2 230/115 kV transformer

Limiting component: Thermal overload on the Rio Oso #1 230/115 kV transformer

2019: No requirement due to Rio Oso Transformers Replacement project.

Critical Sierra Area Contingencies South of Rio Oso

South of Rio Oso Sub-area – Category C

2015 LCR need: 733 MW (includes 31 MW of QF and 593 MW of Muni generation as well as 25 MW of deficiency)

Contingency: Rio Oso-Gold Hill 230 kV and Rio Oso-Lincoln 115 kV lines

Limiting component: Thermal overload on the Rio Oso-Atlantic 230 kV line

2019: No requirement due to New Atlantic-Rio Oso 230 kV line project.

South of Rio Oso Sub-area – Category B

2015 LCR need: 640 MW (includes 31 MW of QF and 593 MW of Muni generation)

Contingency: Rio Oso-Gold Hill 230 kV line and Ralston unit

Limiting component: Thermal overload on the Rio Oso-Atlantic 230 kV line

2019: No requirement due to New Atlantic-Rio Oso 230 kV line project.

Critical Sierra Area Contingencies

Pease

Pease Sub-area – Category C

2015: Category B is most limiting.

2019 LCR need: 93 MW (includes 59 MW of QF generation)

Contingency: Palermo-Pease and Pease-Rio Oso 115 kV lines

Limiting component: Thermal overload on the Table Mountain-Pease 60 kV line

Pease Sub-area – Category B

2015 LCR need: 116 MW (includes 59 MW of QF generation)

Contingency: Palermo-East Nicolaus 115 kV line and YCEC unit

Limiting component: Thermal overload on the Palermo-Pease 115 kV line

2019 LCR need: 51 MW (includes 59 MW of QF generation)

Contingency: Palermo-Pease 115 kV line and YCEC unit

Limiting component: Thermal overload on the Table Mountain-Pease 60 kV line

Critical Sierra Area Contingencies Placer

Placer Sub-area – Category C

2015 LCR need: 125 MW (includes 38 MW of QF and Muni generation as well as 43 MW of deficiency)

Contingency: Gold Hill-Placer #1 and #2 115 kV lines

Limiting component: Thermal overload on the Drum-Higgins 115 kV line

2019 LCR need: 56 MW (includes 38 MW of QF and Muni generation)

Contingency: New Atlantic-Placer and Gold Hill-Placer #1 115 kV lines

Limiting component: Thermal overload on the Drum-Higgins 115 kV line

Placer Sub-area – Category B

2015 LCR need: 108 MW (includes 38 MW of QF and Muni generation as well as 20 MW of deficiency)

Contingency: Gold Hill-Placer #2 115 kV line and Chicago Park unit

Limiting component: Thermal overload on the Drum-Higgins 115 kV line

2019 LCR need: 60 MW (includes 38 MW of QF and Muni generation)

Contingency: New Atlantic-Placer 115 kV line and Chicago Park unit

Limiting component: Thermal overload on the Drum-Higgins 115 kV line

Critical Sierra Area Contingencies Placerville

Placerville Sub-area – Category C

2015 LCR need: 126 MW (includes 0 MW of QF and Muni generation as well as 100 MW of deficiency)

Contingency: Gold Hill-Clarksville and Gold Hill-Missouri Flat #2 115 kV lines

Limiting component: Thermal overload on the Gold Hill-Missouri Flat #1 115 kV line

2019 LCR need: No requirements

Placerville Sub-area – Category B

2015 LCR need: 26 MW (includes 0 MW of QF and Muni generation)

Contingency: Gold Hill-Missouri Flat #2 115 kV line

Limiting component: Thermal overload on the Gold Hill-Missouri Flat #1 115 kV line

2019 LCR need: No requirements

Sierra Area LCR Aggregate

Available generation	Market (MW)	Muni (MW)	QF (MW)	Max. Qualifying Capacity (MW)
2015	769	1138	226	2133
2019	769	1138	226	2133

	Existing Generation Capacity Needed (MW)		Deficiency (MW)		Total MW Need	
	2015	2019	2015	2019	2015	2019
Category B (Single)	1392	525	0	0	1392	525
Category C (Multiple)	1803	1102	395	0	2198	1102

Each unit is only counted once, regardless in how many sub-areas it is needed.

In order to come up with an aggregate deficiency, where applicable the deficiencies in each smaller sub-area has been accounted for (based on their effectiveness factors) toward the deficiency of a much larger sub-area.

Changes

2015 LCR compared to 2014:

- Load forecast went up by 3 MW.
- Overall LCR need has increased by 127 MW.
- The entire increase in LCR is solely due to increase in “deficiency” caused by load growth and delay in transmission project implementation.

2019 LCR compared to 2018:

- Load forecast went down by 100 MW.
- Overall LCR need has decreased by 51 MW.

Your comments and questions are welcome.

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

Stockton Area Load and Resources (MW)

		2015	2019
Load	=	1085	1118
Transmission Losses	=	20	18
Total Load	=	1105	1136
QF Generation	=	65	168
Muni Generation	=	142	142
Market Generation	=	416	416
Total Qualifying Capacity	=	623	726

New transmission projects modeled:

1. Weber-Stockton A #1 & #2 60 kV lines Reconductor
2. Weber 230/60 kV Transformer Replacement (2019 only)
3. Vierra 115 kV loop-in (2019 only)

Critical Stockton Area Contingencies

Tesla-Bellota Sub-area

Tesla-Bellota Sub-area – Category C

TOTAL 2015 LCR need: 579 MW (70 MW of QF and 119 MW of Muni and 235 MW of deficiency)

Contingency 1: Schulte-Lammers and Schulte-Kasson-Manteca 115 kV lines.

Limiting component 1: Thermal overload on the Tesla-Tracy 115 kV line.

LCR Need: 485 MW (70 MW of QF and 119 MW of Muni and 235 MW of deficiency).

Contingency 2: Tesla-Tracy 115 kV line and Tesla-Schulte #2 115 kV line.

Limiting component 2: Thermal overload on the Tesla-Schulte #1 115 kV line.

LCR Need: 345 MW (includes 70 MW of QF and 119 MW of Muni generation).

2019 LCR need: 260 MW (70 MW of QF and 119 MW of Muni generation)

Contingency: Tesla-Schulte #2 115 kV lines and Tesla-Vierra.

Limiting component: Thermal overload on the Tesla-Schulte #1 115 kV line.

Critical Stockton Area Contingencies Tesla-Bellota Sub-area

Tesla-Bellota Sub-area – Category B

2015 LCR Need: 339 MW (includes 70 MW of QF and 119 MW of Muni generation).

Contingency: Tesla-Schulte #2 115 kV line and the loss of GWF Tracy #3.

Limiting component: Thermal overload on the Tesla-Schulte #1 115 kV line.

2019 LCR Need: 163 MW (includes 70 MW of QF and 119 MW of Muni generation).

Contingency: Tesla-Schulte #2 115 kV line and the loss of GWF Tracy #3.

Limiting component: Thermal overload on the Tesla-Schulte #1 115 kV line.

Critical Stockton Area Contingencies Stanislaus Sub-area

Stanislaus Sub-area – Category C

2015 LCR need: Same as Category B

2019 LCR need: Same as Category B

Stanislaus Sub-area – Category B

2015 LCR need: 112 MW (includes 19 MW of QF and 92 MW of Muni generation)

2019 LCR need: 112 MW (includes 19 MW of QF and 92 MW of Muni generation)

Contingency: Bellota-Riverbank-Melones 115 kV line and Stanislaus PH

Limiting component: Thermal overload on the River Bank Jct.-Manteca 115 kV line

Critical Stockton Area Contingencies Lockeford Sub-area

Lockeford Sub-area – Category C

2015 LCR need: 52 MW (includes 2 MW of QF and 23 MW of Muni generation as well as 26 MW of deficiency)

2019 LCR need: 68 MW (includes 2 MW of QF and 23 MW of Muni generation as well as 42 MW of deficiency)

Contingency: Lockeford-Industrial and Lockeford-Lodi #2 60 kV lines

Limiting component: Thermal overload on the Lockeford-Lodi Jct. section of the Lockeford-Lodi #3 60 kV line

Lockeford Sub-area – Category B

2015 LCR need: No category B requirement.

2019 LCR need: No category B requirement.

Critical Stockton Area Contingencies Weber Sub-area

Weber Sub-area – Category C

2015 LCR need: 63 MW (includes 37 MW of QF generation as well as 26 MW of deficiency)

Contingency: Weber 230/60 kV Transformer #1 and Cogeneration National Unit

Limiting component: Weber 230/60 kV Transformer #2 & 2A

2019 LCR need: 22 MW (includes 37 MW of QF generation)

Contingency: Stockton A-Weber #1 and #2 60 kV lines

Limiting component: Thermal overload on the Stockton A-Weber #3 60 kV line

Weber Sub-area – Category B

2015 LCR need: 18 MW (includes 37 MW of QF generation)

Contingency: Weber 230/60 kV Transformer #1

Limiting component: Weber 230/60 kV Transformer #2 & 2A

2019 LCR need: No Category B requirement.

Stockton Area LCR Aggregate

Available generation	Market (MW)	Muni (MW)	QF (MW)	Max. Qualifying Capacity (MW)
2015	416	142	65	623
2019	416	142	168	726

	Existing Generation Capacity Needed (MW)		Deficiency (MW)		Total MW Need	
	2015	2019	2015	2019	2015	2019
Category B (Single)	357	163	0	0	357	163
Category C (Multiple)	407	308	287	42	694	350

Each unit is only counted once, regardless in how many sub-areas it is needed.

In order to come up with an aggregate deficiency, where applicable the deficiencies in each smaller sub-area has been accounted for (based on their effectiveness factors) toward the deficiency of a much larger sub-area.

Changes

2015 LCR compared to 2014:

- Load forecast went down by 58 MW.
- Overall LCR need has decreased by 19 MW.

2019 LCR compared to 2018:

- Load forecast went down by 88 MW.
- Overall LCR need has decreased by 67 MW.

Your comments and questions are welcome.

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