



California ISO
Shaping a Renewed Future

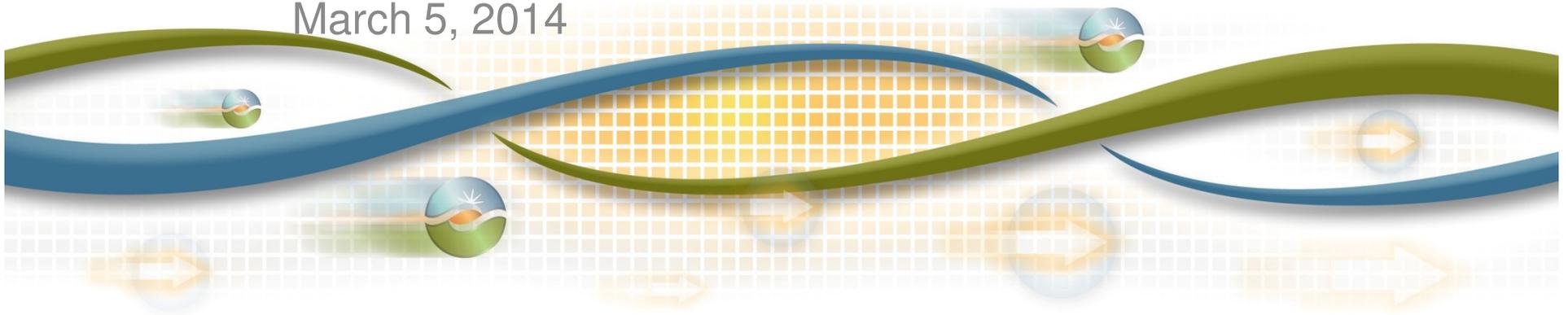
2015 and 2019 Draft LCR Study Results - Big Creek/Ventura and LA Basin

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LA Basin Area Loads & Resources

Load

| Year | Load (MW) | Pump Load (MW) | Transmission Losses (MW) | Total (MW) |
|------|-----------|----------------|--------------------------|------------|
| 2015 | 19819 | 30 | 121 | 19970 |
| 2019 | 20344 | 30 | 132 | 20506 |

Available Generation

| Year | QF/Wind (MW) | Muni (MW) | Nuclear (MW) | Market (MW) | Max. Qualifying Capacity (MW) |
|------|--------------|-----------|--------------|-------------|-------------------------------|
| 2015 | 1043 | 1163 | 0 | 9175 | 11381 |
| 2019 | 1043 | 1163 | 0 | 9175 | 11381 |

Critical Area Contingencies

El Nido Sub-area – Category C

Contingency: Hinson-La Fresa 230 kV line out followed by Double Circuit Tower Line Redondo-La Fresa #1 and #2 230 kV lines

Limiting component: Voltage collapse

2015 LCR need: 515 MW (includes 51 MW of QF and Muni generation)

2019 LCR need: 518 MW (includes 51 MW of QF and Muni generation)

El Nido Sub-area – Category B

No requirement.

Critical Area Contingencies

West of Devers Sub-area – Category C

Contingency: San Bernardino-Etiwanda 230 kV line out followed by San Bernardino-Vista 230 kV line or vice versa

Limiting component: Voltage collapse

2015 LCR need: 485 MW (includes 2 MW of QF generation)

2019 LCR need: 485 MW (includes 2 MW of QF generation)

West of Devers Sub-area – Category B

No requirement.

Critical Area Contingencies

Valley-Devers Sub-area – Category C

Contingency: Palo Verde-Colorado River 500 kV line out followed by Alberhill-Serrano 500 kV line or vice versa

Limiting component: Camino -Iron Mountain 230 kV line

2015 LCR need :1453 MW (includes 182 MW of QF and Wind)

2019 LCR need: 1180 MW (includes 182 MW of QF and Wind)

Valley-Devers Sub-area – Category B

No requirement.

Critical Area Contingencies

Western LA Basin Sub-area – Category C

Contingency: Serrano-Villa Park #2 230 kV line out followed by Serrano-Lewis #1 or #2 230 kV line or vice versa

Limiting component: Serrano-Villa Park #1 230 kV line

2015 LCR need: 4,583 MW (includes 1,150 MW of QF, Muni and Wind)

2019 LCR need: 5,096 MW (includes 1,150 MW of QF, Muni and Wind)

Western LA Basin Sub-area – Category B

Non binding – multiple combinations possible.

Critical Area Contingencies

LA Basin Overall – Category B

Contingency: Palo Verde-Colorado River 500 kV line with the biggest G-1 out of service

Limiting component: South of Lugo 500 kV Path rating

2015 LCR need: 8,620 MW (includes 2,206 MW of QF, Muni and Wind)

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

Limiting component: Sylmar-Eagle Rock 230 kV line

2019 LCR need: 9,059 MW (includes 2,206 MW of QF, Muni and Wind)

LA Basin Overall – Category C

Contingency: Miguel-ECO 500 kV line followed by Imperial Valley-Suncrest 500 kV line

Limiting component: Voltage instability

2015 LCR need: 11,365 MW (includes 2,206 MW of QF, Muni and Wind)

Contingency: Sylmar-Gould 230 kV line followed by Lugo-Victorville 500 kV line (With CFE phase shifter, assuming 520 MW additional capacity in SDGE)

Limiting component: Sylmar-Eagle Rock 230 kV line

2019 LCR need: 9,119 MW (includes 2,206 MW of QF, Muni and Wind)

Contingency: Miguel-ECO 500 kV line followed by Imperial Valley-Suncrest 500 kV line (Without CFE phase shifter, assuming 520 MW additional capacity in SDGE)

Limiting component: Voltage instability

2019 LCR need: 9,955 MW (includes 2,206 MW of QF, Muni and Wind)

Changes

Since last year:

- 1) 2015 Load forecast is up by 276 MW vs. 2014
- 2) Total overall 2015 LCR is up by 935 MW for Category C, due load increase in both SCE and SDGE.
- 3) Segments of TRTP project
- 4) 2019 load forecast is down by 201 MW vs. 2018
- 5) With and without phase shifter on IV – CFE line were studied for 2019 LCR. Total overall Long-term LCR is down by 763 MW for Category B mainly due to load decrease and flow pattern changes after SONGS units permanently retired.
- 6) IV-Suncrest and Miguel-Eco N-1-1 is not the critical contingency if the phase shifter is modeled.

Your comments and questions are welcome.

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

Big Creek/Ventura Area Loads & Resources

Load

| Year | Load (MW) | Pump Load (MW) | Transmission Losses (MW) | Total (MW) |
|------|-----------|----------------|--------------------------|------------|
| 2015 | 4372 | 363 | 72 | 4807 |
| 2019 | 4451 | 363 | 75 | 4889 |

Available Generation

| Year | QF (MW) | Muni (MW) | Wind (MW) | Market (MW) | Max. Qualifying Capacity (MW) |
|------|---------|-----------|-----------|-------------|-------------------------------|
| 2015 | 752 | 381 | 46 | 3850 | 5029 |
| 2019 | 752 | 381 | 46 | 3669 | 4848 |

Critical Area Contingencies

Rector Sub-area – Category B

Contingency: Vestal-Rector #1 or #2 230 kV line with Eastwood out of service

Limiting component: Remaining Vestal-Rector 230 kV line

2015 LCR need: 479 MW (includes 7 MW of QF generation)

2019 LCR need: 479 MW (includes 7 MW of QF generation)

Rector Sub-area – Category C

Same as above.

Vestal Sub-area – Category B

Contingency: Magunden-Vestal #1 or #2 230 kV line with Eastwood out of service

Limiting component: Remaining Magunden-Vestal 230 kV line

2015 LCR need: 762 MW (includes 104 MW of QF generation)

2019 LCR need: 744 MW (includes 104 MW of QF generation)

Vestal Sub-area – Category C

Same as above.

Critical Area Contingencies

Santa Clara Sub-area – Category C

Contingency: Pardee-S. Clara 230 kV line followed by DCTL Moorpark-S. Clara #1 and #2 230 kV lines

Limiting component: Voltage collapse

2015 LCR need: 264 MW (includes 65 MW of QF generation)

2019 LCR need: 264 MW (includes 65 MW of QF generation)

Santa Clara Sub-area – Category B

No requirement.

Critical Area Contingencies

Moorpark Sub-area – Category C

Contingency: Pardee-Moorpark #3 230 kV line followed by DCTL Pardee-Moorpark #1 and #2 230 kV lines

Limiting component: Voltage collapse

2015 LCR need: 479 MW (includes 93 MW of QF generation)

2019 LCR need: 479 MW (includes 93 MW of QF generation)

Moorpark Sub-area – Category B

No requirement.

Critical Area Contingencies

Big Creek/Ventura Overall – Category C

Contingency: Sylmar-Pardee #1 or #2 230 kV line followed Lugo-Victorville 500 kV or vice versa

Limiting component: Remaining Sylmar-Pardee 230 kV line

2015 LCR need: 2,270 MW (includes 1,179 MW of QF, Muni and Wind)

2019 LCR need: 2,499 MW (includes 1,179 MW of QF, Muni and Wind)

Big Creek/Ventura Overall – Category B

Contingency: Sylmar-Pardee #1 or #2 230 kV line with Omond #2 out of service

Limiting component: Remaining Sylmar-Pardee 230 kV line

2015 LCR need: 2,095 MW (includes 1,179 MW of QF, Muni and Wind)

2019 LCR need: 2,619 MW (includes 1,179 MW of QF, Muni and Wind)

Changes

Since last year:

- 1) 2015 load forecast is up by 227 MW vs. 2014
- 2) Load reallocation between substations in the area
- 3) Segments of TRTP project
- 4) Overall LCR is up by 20 MW due to both load increase and SONGS retirement
- 5) 2019 load forecast is up by 75 MW vs. 2018
- 6) Overall long-term LCR is down by 69 MW due to the flow pattern changes after SONGS retirement

Your comments and questions are welcome.

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