



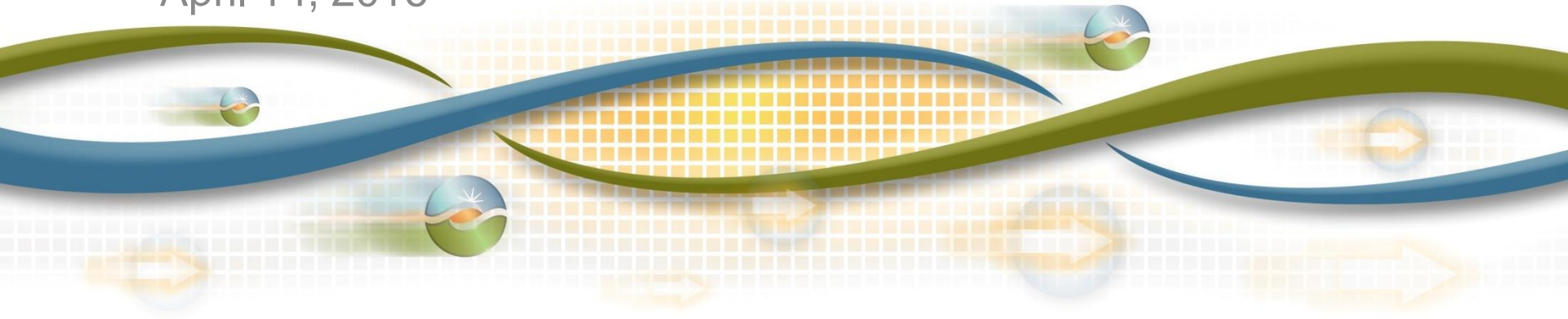
2017 Final LCR Study Results Fresno

Vera Hart

Regional Transmission Engineer

Stakeholder Call

April 14, 2016



Fresno LCR Area



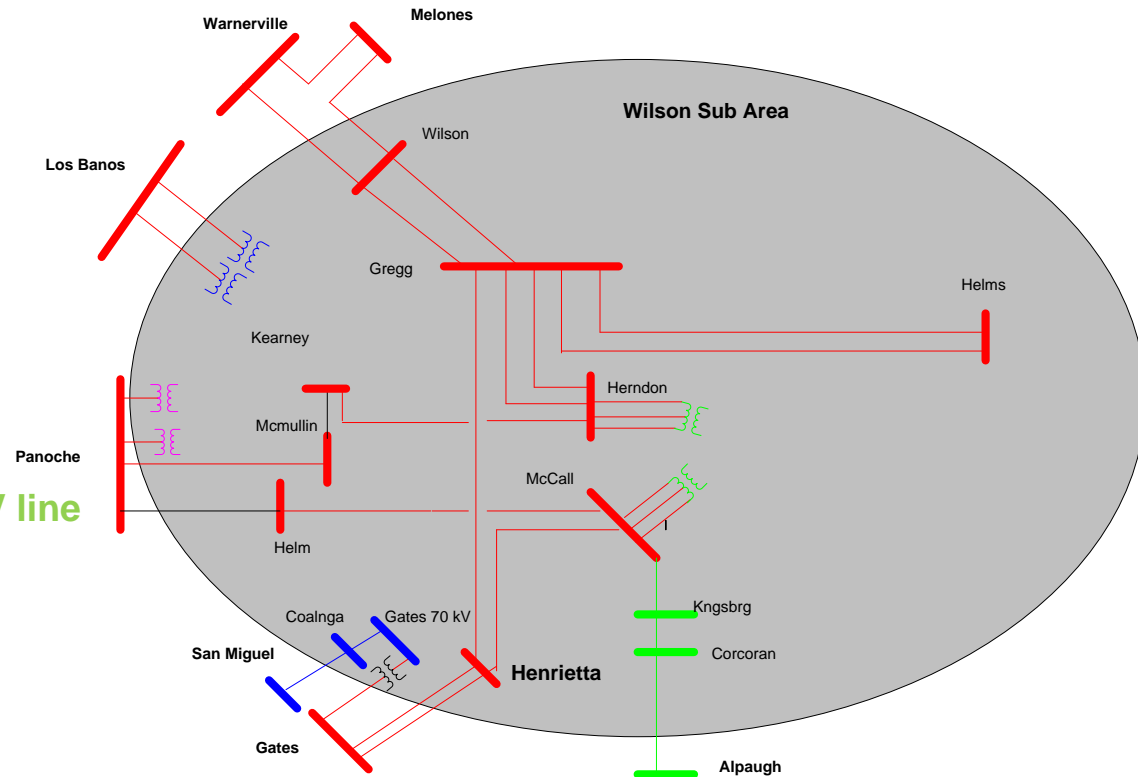
Greater Fresno Area

Electrical Boundaries and LCR Sub-Areas

Electrical Boundaries:

- Gates – McCall 230 kV line
- Gates – Gregg 230 kV line
- Panoche – Kearney 230 kV line
- Panoche – Helm 230 kV line
- Warnerville – Wilson 230 kV line
- Melones – Wilson 230 kV line
- Panoche 230/115 kV transformer #1
- Panoche 230/115 kV transformer #2
- Smyrna – Alpaugh – Corcoran 115 kV line
- Los Banos #3 230/70 kV transformer
- Los Banos #4 230/70 kV transformer
- San Miguel – Coalinga #1 70 kV line
- Gates 230/70 kV transformer #1

LCR Sub-Areas:



Fresno Area Load and Resources (MW)

2017

Load	=	2867
AAEE	=	-35
Transmission Losses	=	132
Total Load	=	2964
Market Generation	=	3072
Muni Generation	=	167
QF Generation	=	64
Total Qualifying Capacity	=	3303

New transmission projects modeled:

1. Kearney 230/70 kV Transformer Addition (2017)
2. Kearney - Caruthers 70 kV Line Reconductor (2017)
3. Caruthers - Kingsburg 70 kV Line Reconductor (2017)
4. Reedley-Dinuba 70 kV Line Reconductor (2017)
5. Reedley-Orosi 70 kV Line Reconductor (2017)
6. Helm - Kerman 70 kV Line Reconductor (2017)
7. Oakhurst/Coarsegold UVLS (2017)
8. Gregg - Herndon #2 230 kV Line Circuit Breaker Upgrade (2017)
9. Los Banos - Livingston Jct - Canal 70 kV Switch Replacement (2017)
10. Warnerville - Bellota 230 kV Line Reconductoring (2017)

Fresno Area LCR

2017 Hanford Sub-Area

Limiting Contingencies:

Category P6:

- L-1/T-1: McCall-Kingsburg #2 115 kV & Henrietta 230/115kV TB #3
- Constraint McCall-Kingsburg #1 115kV line

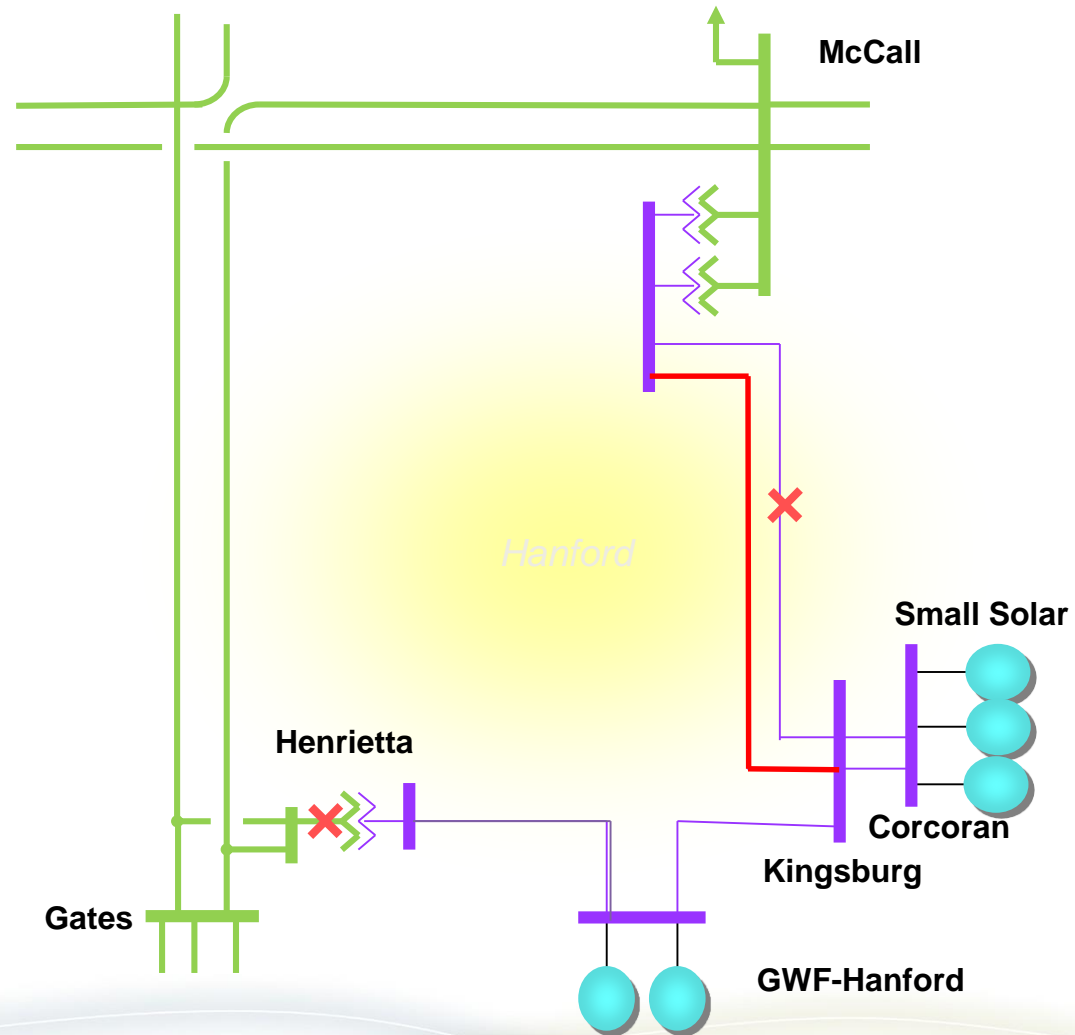
Category P1: No LCR need

LCR Results (MW):

Contingency	Cat. P6
LCR	58

Including:

QF	0
Muni	0
Deficiency	0



Fresno Area LCR

2017 Coalinga Sub-Area

Limiting Contingencies:

Category P1-P7:

- T-1/L-2: Gates 230/70kV TB #5 and Panoche-Schindler #1 & #2 115kV common tower lines
- Constraint:
 - Voltage instability

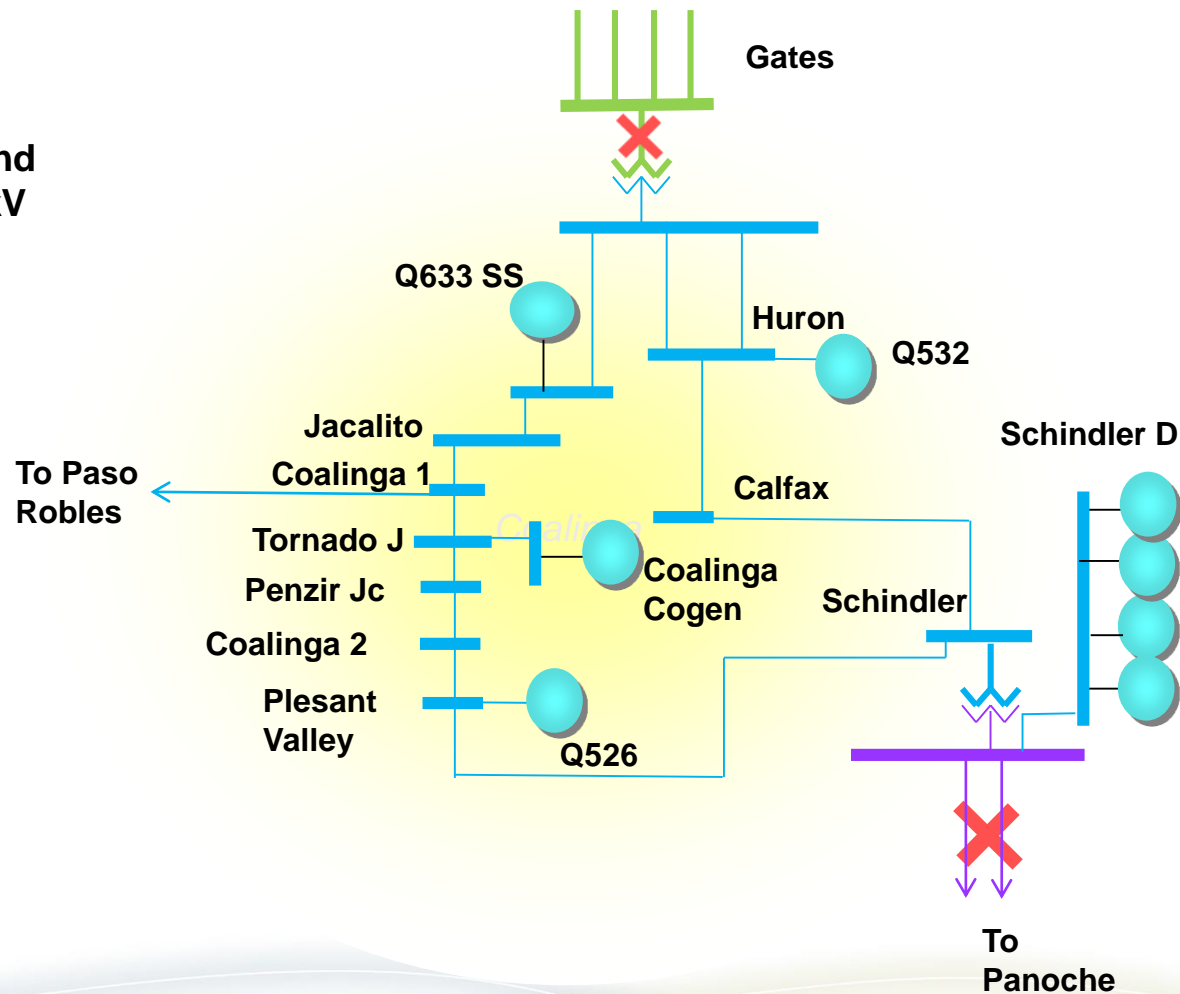
Category P1: No LCR need

LCR Results (MW):

Contingency	Cat. P1-P7
LCR	33

Including:

QF	2
Muni	0
Deficiency	0



Fresno Area LCR

2017 Reedley Sub-Area

Limiting Contingencies:

Category P6:

- L-1-1: McCall-Reedley (McCall-Wahtoke) 115 kV & Sanger-Reedley(Pomegranate-Pomegranate Jct) 115kV
- Constraint: Kings River-Sanger-Reedley 115 kV

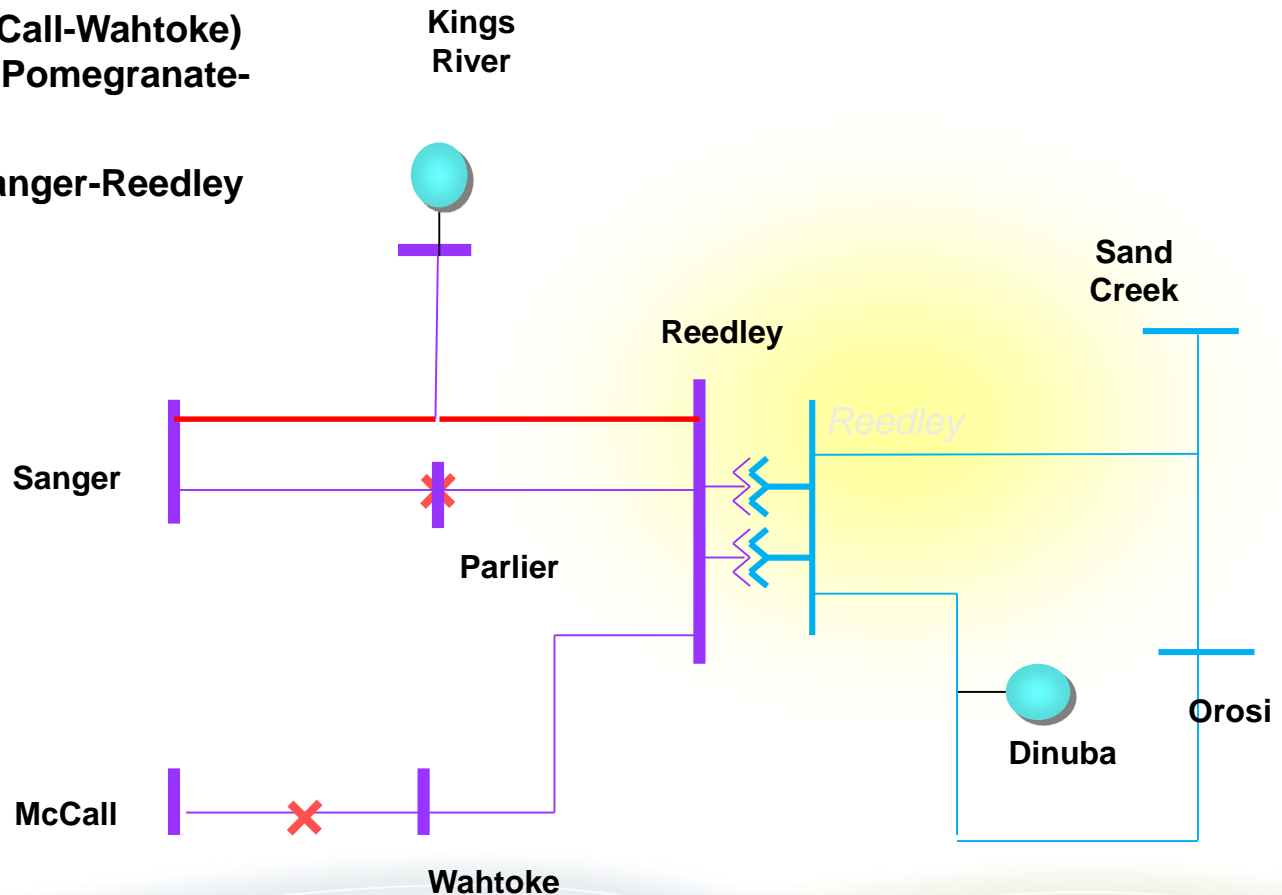
Category P1: No LCR need

LCR Results (MW):

Contingency	Cat. P6
LCR	29

Including:

QF	0
Muni	0
Deficiency	19



Fresno Area LCR

2017 Herndon Sub-Area

Limiting Contingency:

Category P3:

- G-1/L-1: Herndon-Barton 115kV & Kings River
- Constraint: Herndon-Manchester 115kV

Category P6: Same as Category P3

Category P7: -

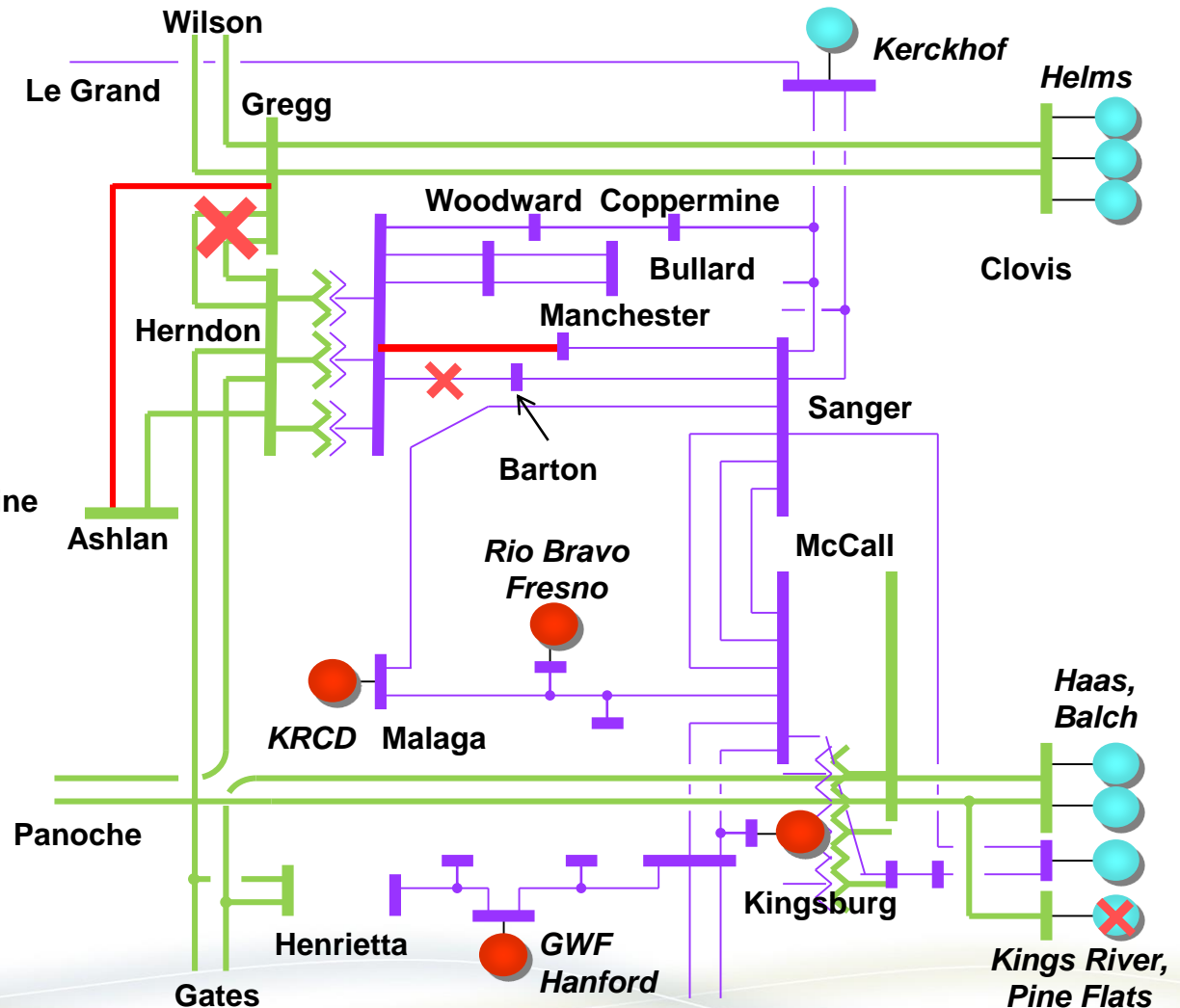
- L-2: Gregg-Herndon #1 & #2 230kV Lines
- Constraint: Gregg-Ashlan 230 kV Line

LCR Results (MW):

Contingency	Cat. P3	Cat. P7
2017 LCR	290	431

Including:

QF	23	23
Muni	66	66



Fresno Area LCR

2017 Wilson Sub-Area

Limiting Contingencies:

Category P3:

- G-1/L-1: Melones – Wilson 230 kV with one Helms unit out of service
- Constraint: Warnerville-Wilson 230 kV

Category P6:

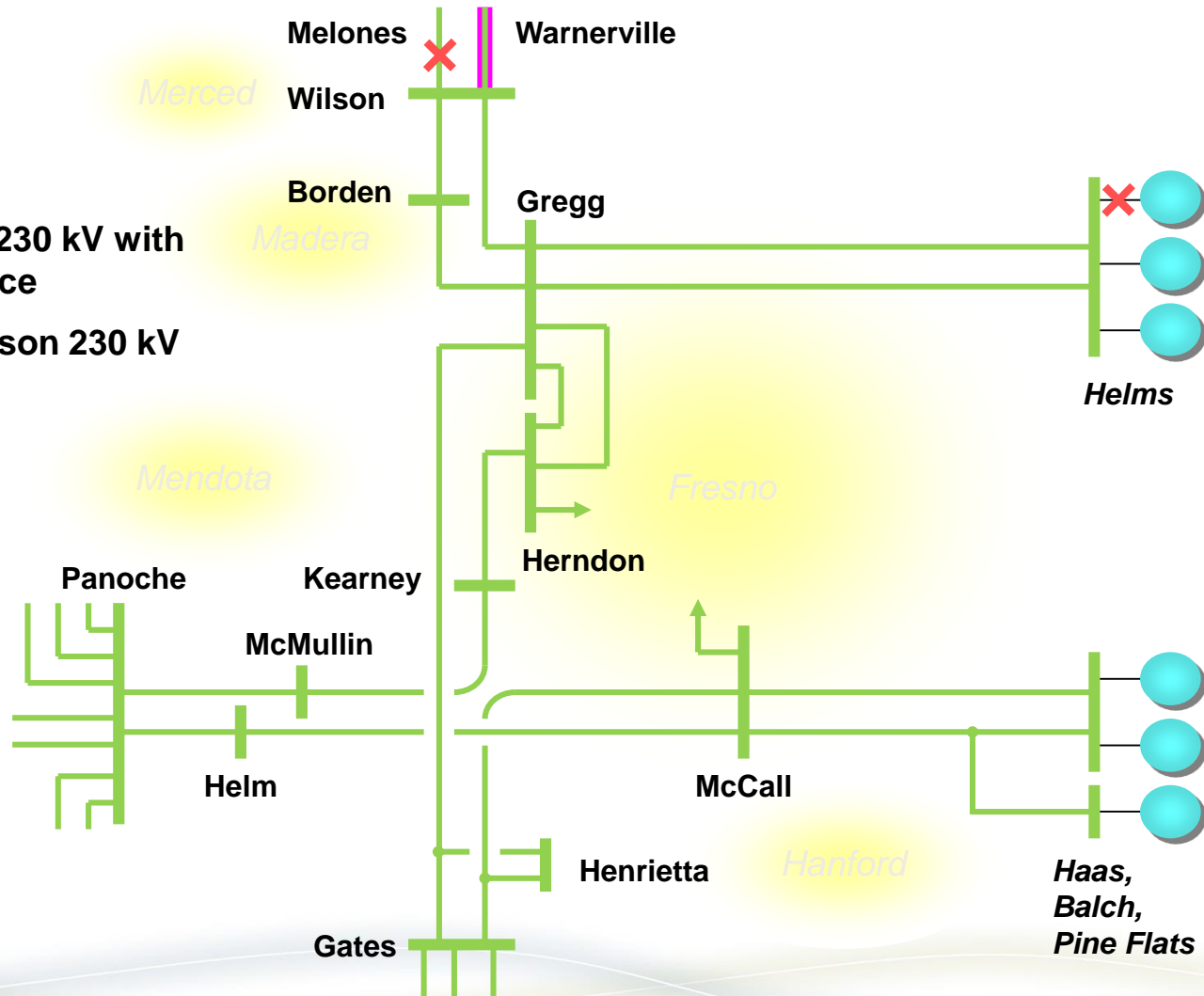
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LCR Results (MW):

Contingency	Cat. P3
LCR	1760

Including:

QF	64
Muni	167
Deficiency	0



Fresno Area LCR

2017 Wilson Sub-Area

Limiting Contingencies:

Category P6: - Contingency 1

- L-1/G-1: Melones – Wilson 230 kV followed by one Helms unit out
- Constraint: Warnerville-Wilson 230 kV
- LCR: 1650 MW

Category P7: - Contingency 2

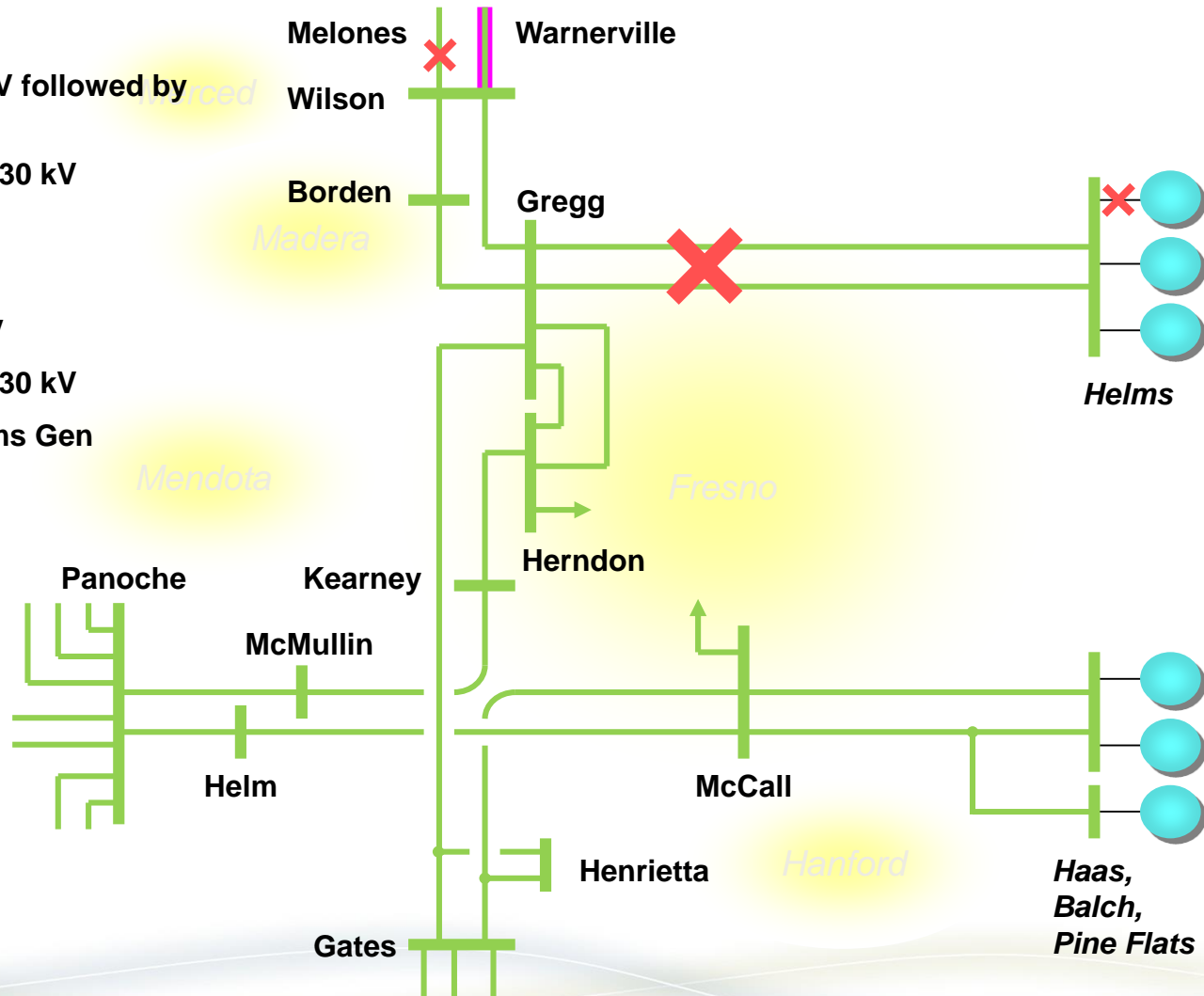
- L-2: Gregg-Helms #1 & #2 230 kV
- Constraint: Warnerville-Wilson 230 kV
- LCR: 934 MW Not Including Helms Gen

LCR Results (MW):

Contingency	Cat. P3	Cat. P7
LCR	1760	934

Including:

QF	64	64
Muni	167	167
Deficiency	0	0



Changes

Since last year:

- 1) 2017 load decreased by 367 MW vs. 2016
- 2) LCR has decreased by 740 MW due to load decrease

Since last stakeholder meeting:

- 1) Updated NQC

Your comments and questions are welcome.

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