2010 LCR Study
Sierra and Stockton Local Areas

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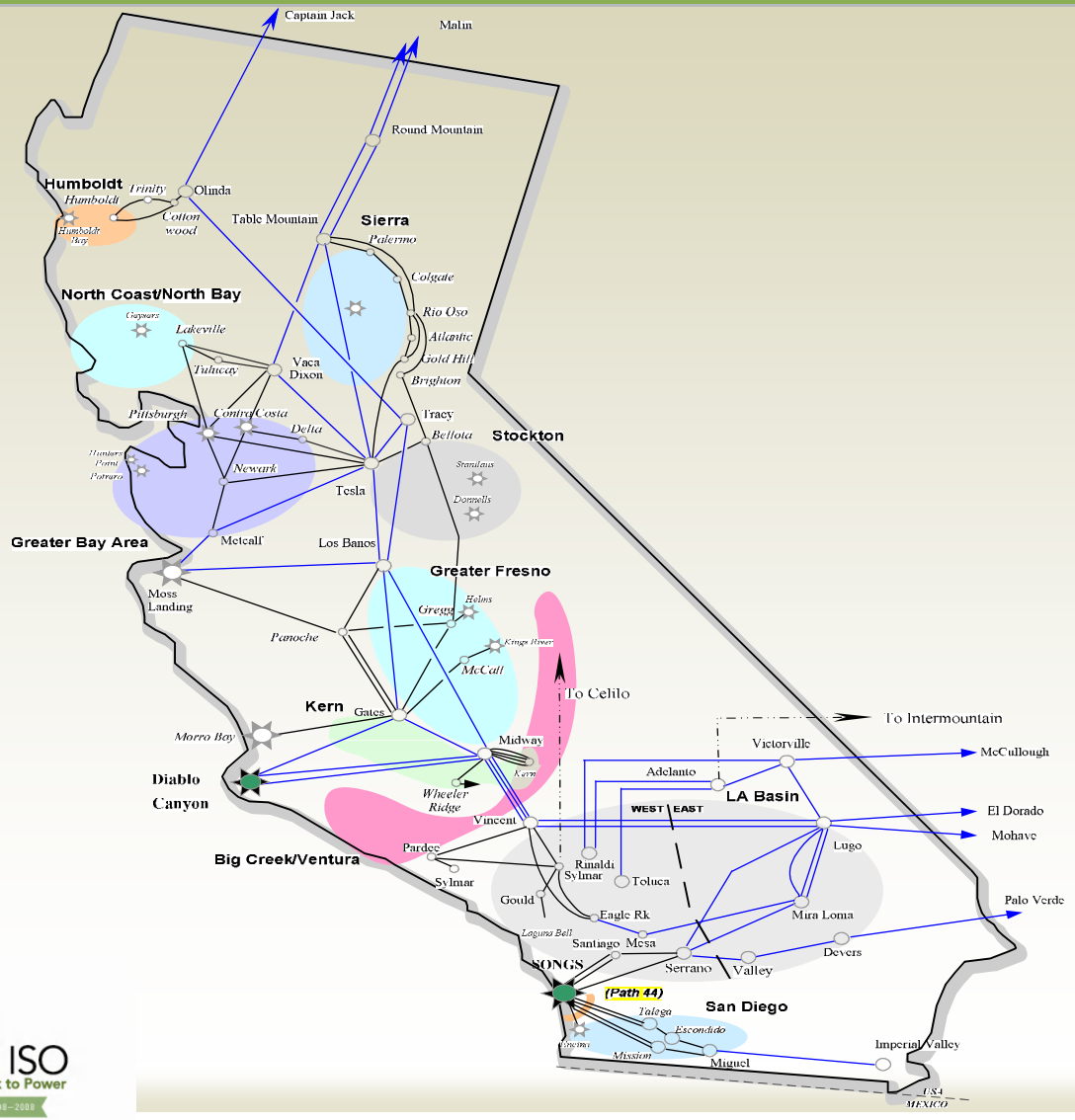
Stakeholder Meeting

March 10, 2009

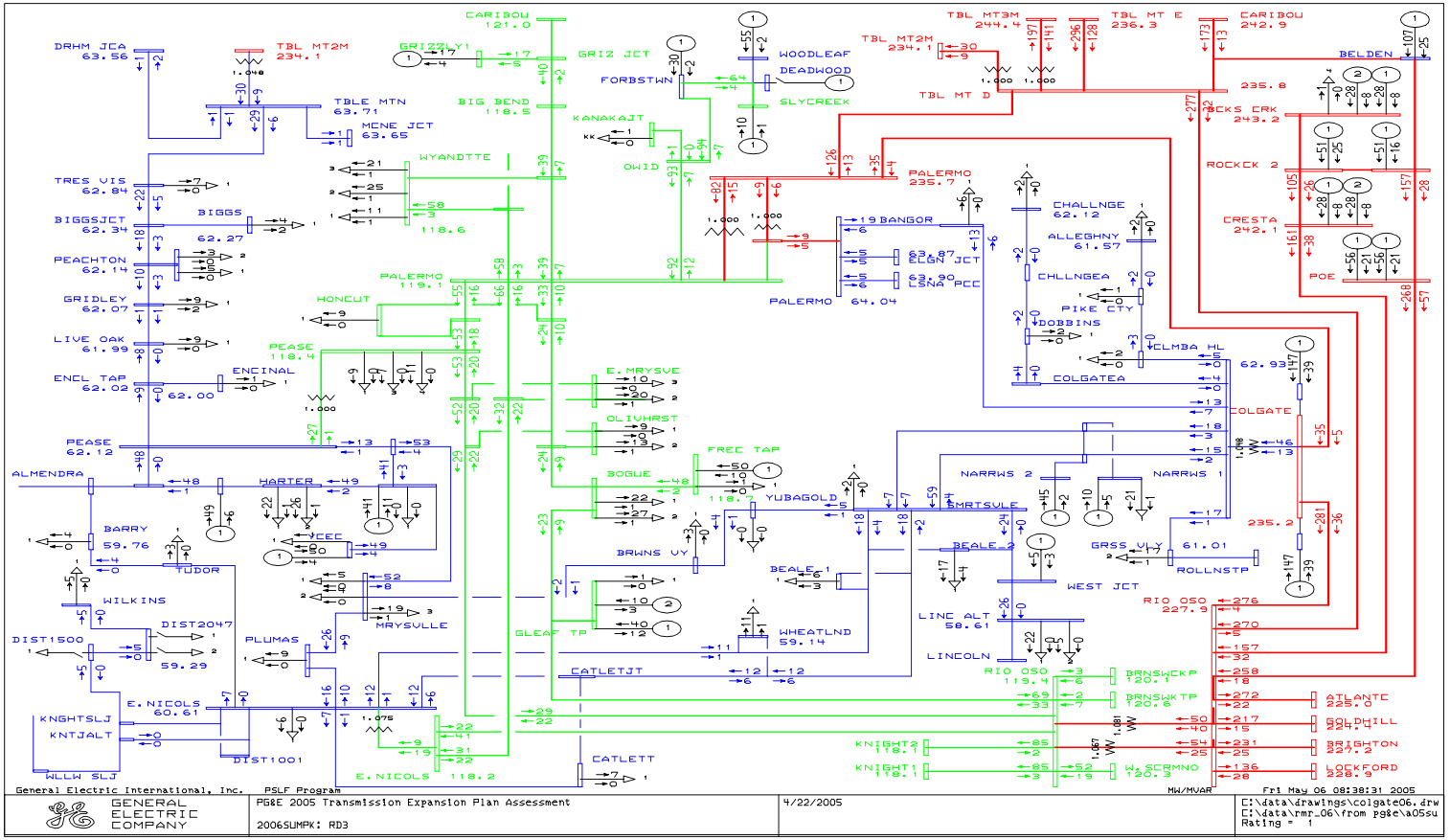
LCR Areas


Captain Jack
Malin
Round Mountain
Humboldt
Trinity
Olinda
Humboldt
Cotton wood
Table Mountain
Sierra
Palermo
Colgate
North Coast/North Bay
Rio Oso
Lakeville
Atlantic
Gold Hill
Vaca Dixon
Tulucay
Brighton
Pittsburgh
Contra Costa
Tracy
Delta
Bellota
Stockton
Newark
Tesla
Stanislaus
Donnells
Greater Bay Area
Metcalf
Los Banos
Greater Fresno
Moss Landing
Gregg
Helms
Panoche
Kings River
McCall
To Celilo
Kern
Gates
To Intermountain
Morro Bay
Midway
Victorville
McCullough
Kern
Adelanto
Diablo Canyon
Wheeler Ridge
LA Basin
WEST
EAST
El Dorado
Vincent
Mohave
Pardee
Lugo
Big Creek/Ventura
Rinaldi
Sylmar
Toluca
Sylmar
Gould
Palo Verde
Eagle Rk
Mira Loma
Laguna Bell
Santiago
Mesa
Devers
SONGS
Serrano
Valley
(Path 44)
San Diego
Talega
Escondido
Imperial Valley
Mission
Miguel
USA
MEXICO

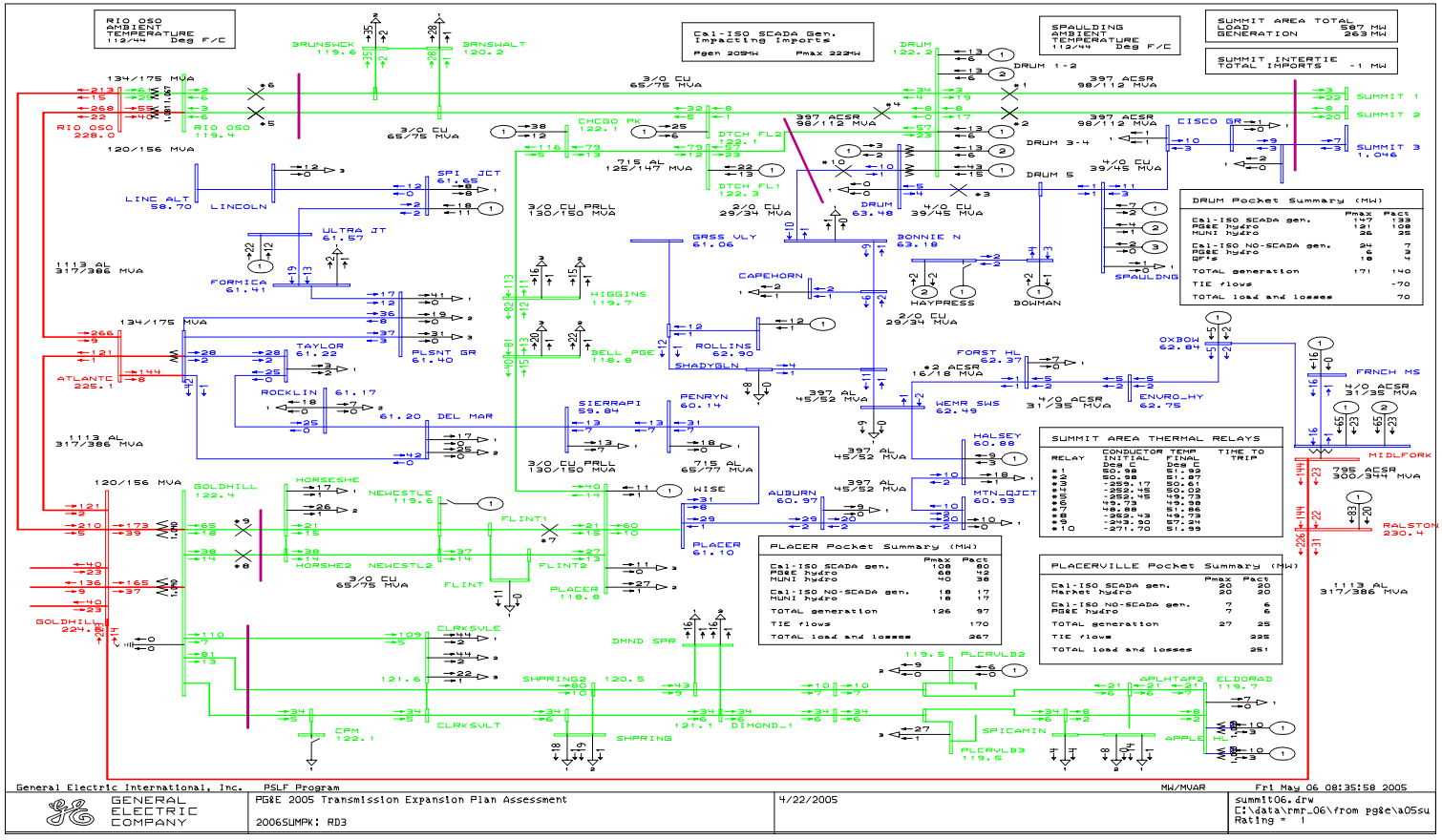
Sierra Area Load and Resources (MW)

		2010
Load	=	2009
Transmission Losses	=	117
Total Load	=	**2126**
Market Generation	=	769
Muni Generation	=	794
QF Generation	=	222
Total Qualifying Capacity	=	**1785**

Northern Sierra



Southern Sierra



Critical Sierra Area Contingencies
South of Table Mountain

South of Table Mountain Sub-area – Category C

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

LCR need: 1667 MW (includes 222 MW of QF and 794 MW of Muni generation)

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

South Of Table Mountain Sub-area – Category B

Contingency: Table Mountain-Rio Oso 230 kV line with Colgate #1 unit out of service

LCR need: 1083 MW (includes 222 MW of QF and 794 MW of Muni generation)

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

Critical Sierra Area Contingencies
Pease & Bogue

Pease Sub-area

Contingency: Palermo-East Nicolaus 115 kV line with Green Leaf II Co-gen unit out of service

LCR need: 137 MW (includes 92 MW of QF)

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

Bogue Sub-area

No requirements, because of the following projects:

1. South of Palermo 115 kV reconductoring

If this project is not operational by June 1, 2010 then all the units in this area Greenleaf #1 and Feather River Energy Center are needed.

Critical Sierra Area Contingencies
South of Palermo

South Of Palermo Sub-area – Category C

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

LCR need: 1512 MW (includes 614 MW of QF and Muni generation as well as 129 MW of Deficiency)

Limiting component: Thermal overload on the Palermo #2 230/115 kV transformer

South Of Palermo Sub-area – Category B

Contingency: Table Mountain-Rio Oso 230 kV line with Wood leaf unit out of service

LCR need: 1405 MW (includes 614 MW of QF and Muni generation as well as 22 MW of Deficiency)

Limiting component: Thermal overload - Palermo #2 230/115 kV transformer

Both category C and B LCR needs have increased from 2009 because of the Palermo #2 230/115 kV transformer derate.

Critical Sierra Area Contingencies
Colgate

Colgate Sub-area

No requirements, because of the following projects:

1. Colgate 230/60 kV transformer upgrade
2. Second Pease-Marysville 60 kV line
3. Atlantic-Lincoln 115 kV upgrade.

If this project is not operational by June 1, 2010 then all the units in this area Narrows #1 and #2 as well as Camp Far West are needed.

Critical Sierra Area Contingencies
Drum-Rio Oso

Drum-Rio Oso Sub-area – Category C

Contingency: Rio Oso #2 230/115 kV transformer followed by loss of the Rio Oso-Brighton 230 kV line or vice versa

LCR need: 829 MW (includes 422 MW of QF and Muni generation as well as 143 MW of Deficiency)

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

South of Rio Oso Sub-area – Category B

Contingency: Rio Oso # 2 230/115 kV transformer

LCR need: 493 MW (includes 422 MW of QF and Muni generation)

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

Critical Sierra Area Contingencies
South of Rio Oso

South of Rio Oso Sub-area – Category C

Contingency: Rio Oso-Gold Hill 230 line followed by loss of the Rio Oso-Lincoln 115 kV line or vice versa

LCR need: 593 MW (includes 293 MW of QF and Muni generation as well as 224 MW of Deficiency)

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

South of Rio Oso Sub-area – Category B

Contingency: Rio Oso-Gold Hill 230 line with the Ralston unit out of service

LCR need: 471 MW (includes 293 MW of QF and Muni generation as well as 102 MW of Deficiency)

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

Critical Sierra Area Contingencies
Placer

Placer Sub-area – Category C

Contingency: Drum-Higgins 115 kV line followed by loss of the Gold Hill-Placer #2 115 kV line or vice versa

LCR need: 122 MW (includes 0 MW of QF and Muni generation as well as 97 MW of Deficiency)

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

Placer Sub-area – Category B

Contingency: Drum-Higgins 115 kV line with the Halsey unit out of service

LCR need: 17 MW (includes 0 MW of QF and Muni generation)

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

Critical Sierra Area Contingencies
Placerville

Placerville Sub-area – Category C

Contingency: Gold Hill-Clarksville 115 kV line followed by loss of the Gold Hill-Missouri Flat #2 115 kV line or vice versa

LCR need: 100 MW (includes 0 MW of QF and Muni generation as well as 71 MW of Deficiency)

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

Placerville Sub-area – Category B

No requirements, because of the following projects:

1. Gold Hill-Missouri Flat #1 and #2 115 kV Line Reconductoring

Critical Sierra Area Contingencies Aggregate

	QF (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	222	794	769	1785

	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
Category B (Single)	1405	115	1520
Category C (Multiple)	1667	396	2063

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 since the 2009 LCR study

Total LCR Need has decreased

Mainly because of new transmission project:

1. Table Mountain-Rio Oso 230 kV Reconductoring and Tower Upgrade
2. Gold Hill-Missouri Flat #1 and #2 115 kV Line Reconductoring
3. South of Palermo 115 kV Reconductoring
4. Atlantic-Lincoln 115 kV Upgrade
5. Colgate 230/60 kV Transformer Reinforcement
6. Pease-Marysville #2 60 kV Line
7. Palermo 32 230/115 kV Transformer Derate

Stockton Area Load and Resources (MW)

		2010
Load	=	1312
Transmission Losses	=	23
Total Load	=	**1335**
Market Generation	=	266
Muni Generation	=	189
QF Generation	=	90
Total Qualifying Capacity	=	**545**

Critical Stockton Area Contingencies
Tesla-Bellota Sub-area

Tesla-Bellota Sub-area – Category C

Contingency 1: Tesla-Tracy 115 kV line and Schulte-Lammers 115 kV line.

LCR Need: 501 MW (205 MW of QF/Muni and 197 MW of deficiency).

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

Contingency 2: Tesla-Tracy 115 kV line and Tesla-Kasson-Manteca 115 kV line.

LCR Need: 405 MW (includes 205 MW of QF and Muni generation).

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

TOTAL LCR Need: 609 MW (205 MW of QF/Muni and 197 MW of deficiency)

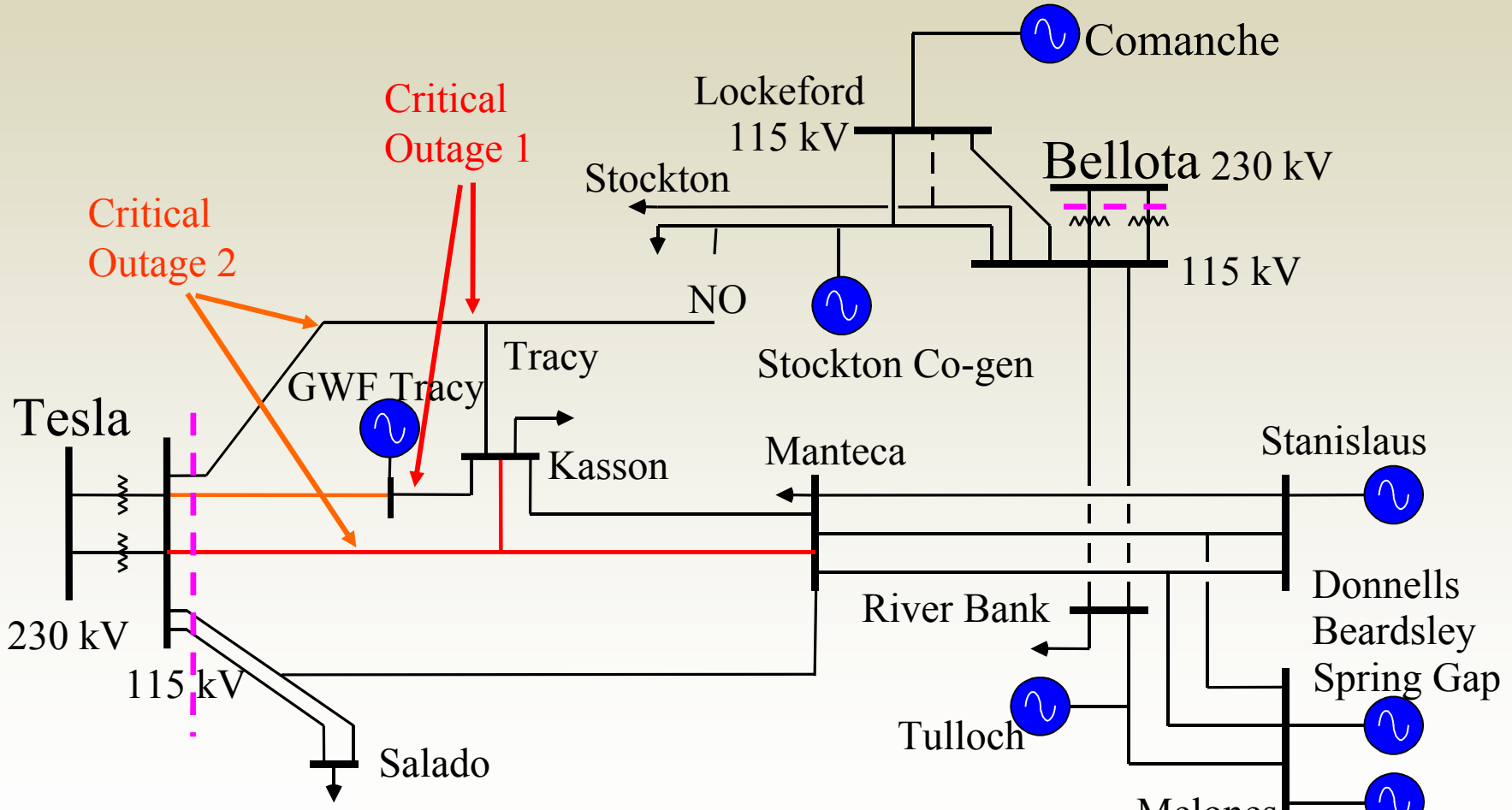
Tesla-Bellota Sub-area – Category B

Contingency: Tesla-Tracy 115 kV line and the loss of Stanisls #1.

LCR Need: 357 MW (includes 205 MW of QF and Muni generation).

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

Tesla-Bellota 115 kV Area Transmission



Critical Stockton Area Contingencies
Lockeford Sub-area

Lockeford Sub-area – Category C

Contingency: Lockeford-Industrial followed by Lockeford-Lodi #2 60 kV line or vice versa

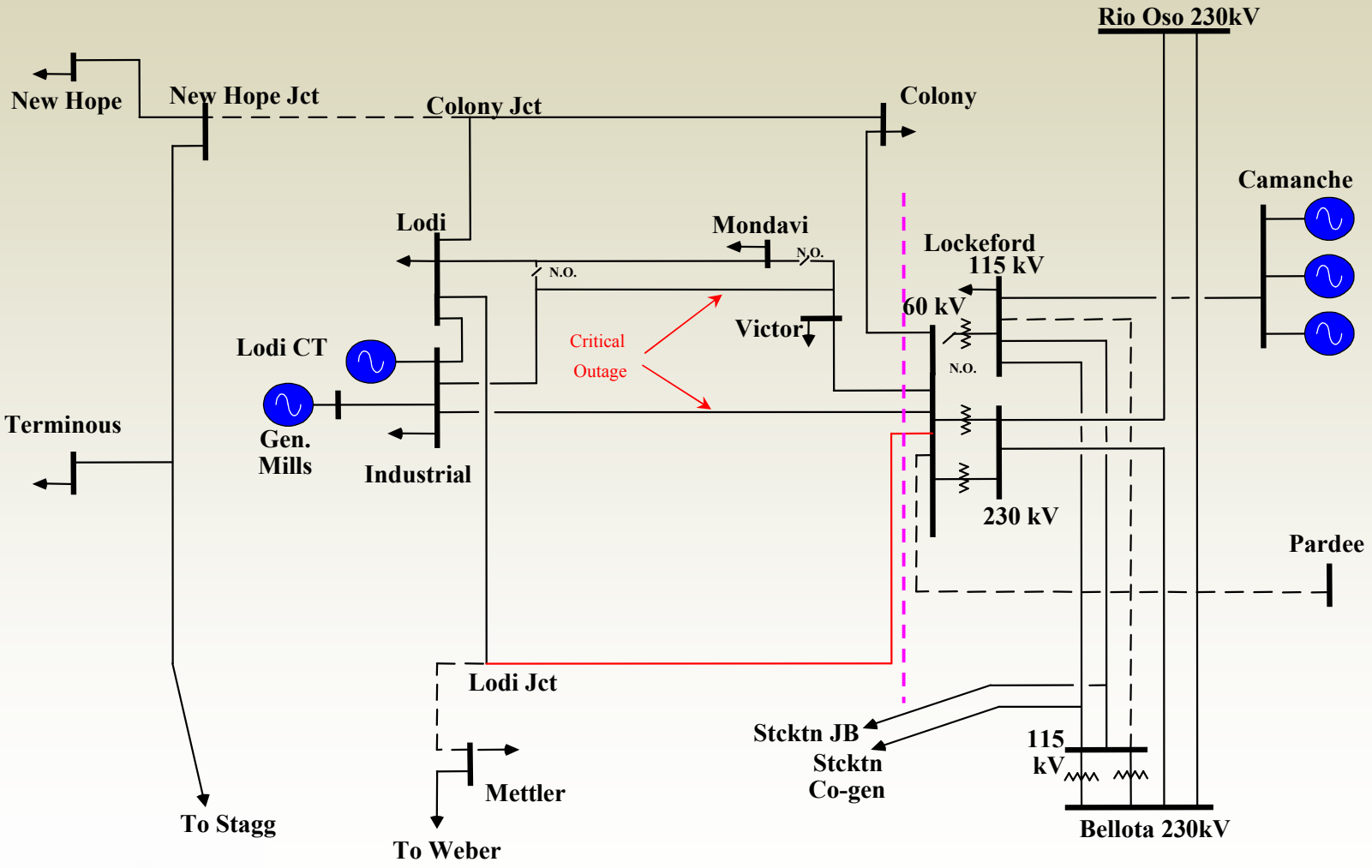
LCR need: 72 MW (includes 25 MW of QF and Muni generation as well as 52 MW of Deficiency)

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

Lockeford Sub-area – Category B

Not needed due to load decrease between 2009 and 2010.

Lockeford 60 kV Area Transmission



Critical Stockton Area Contingencies
Stagg Sub-area

Stagg Sub-area eliminated from LCR due to the Stagg Under Voltage Load Shedding scheme.

Problem: Lodi Stigg unit

1. The unit is effective in mitigating the following Sierra constraints: South of Rio Oso, South of Palermo and South of Table Mountain with the first two being deficient sub-areas.

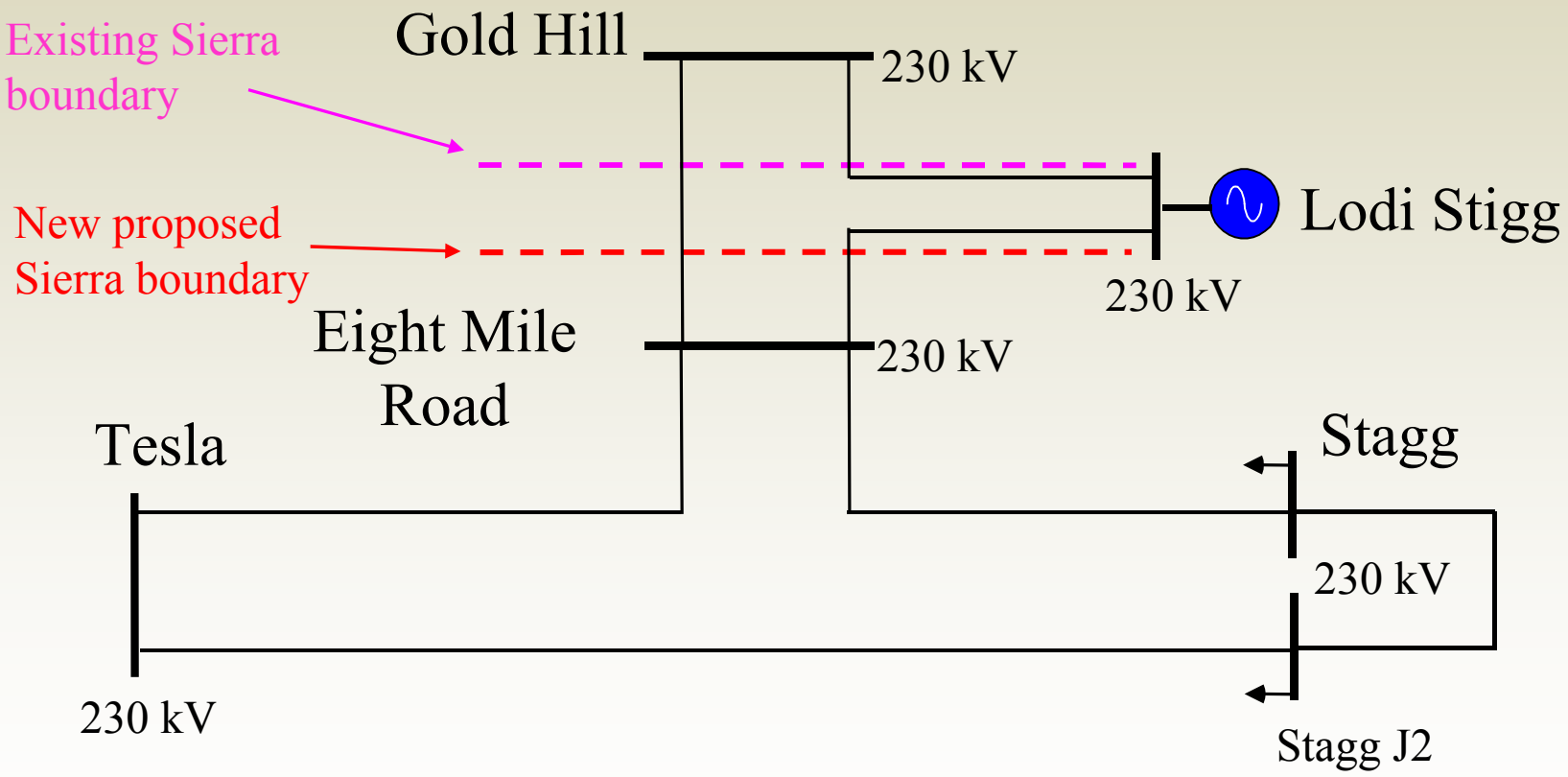
2. The unit does not create or otherwise exacerbate in any negative way any local constraints in Sierra or Stockton.

3. If on-line the Stagg UVLS will not trip load at summer peak after double-line outage in the area.

4. Proposed change in Sierra boundary in order to include this unit.

5. No additional procurement needed because unit is already under long-term RA contract, however CAISO needs to make sure we can dispatch under local emergency conditions.

Solution: change Sierra definition by one bus



Critical Stockton Area Contingencies Aggregate

	QF (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	90	189	265	545

	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Need
Category B (Single)	357	0	357
Category C (Multiple)	432	249	681

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 since the 2009 LCR study

Total LCR Need has decreased

The load forecast is lower by 101 MW.

The total LCR need has decreased by 45 MW.

The existing generation capacity needed has decreased by 109 MW.

Mainly because of the following transmission projects:

1. Stagg UVLS and

2. Reconductoring of Tesla-Salado-Manteca 115 kV line.