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Year 2008 LCR Study

Sierra Area in PG&E System

Summary of Findings

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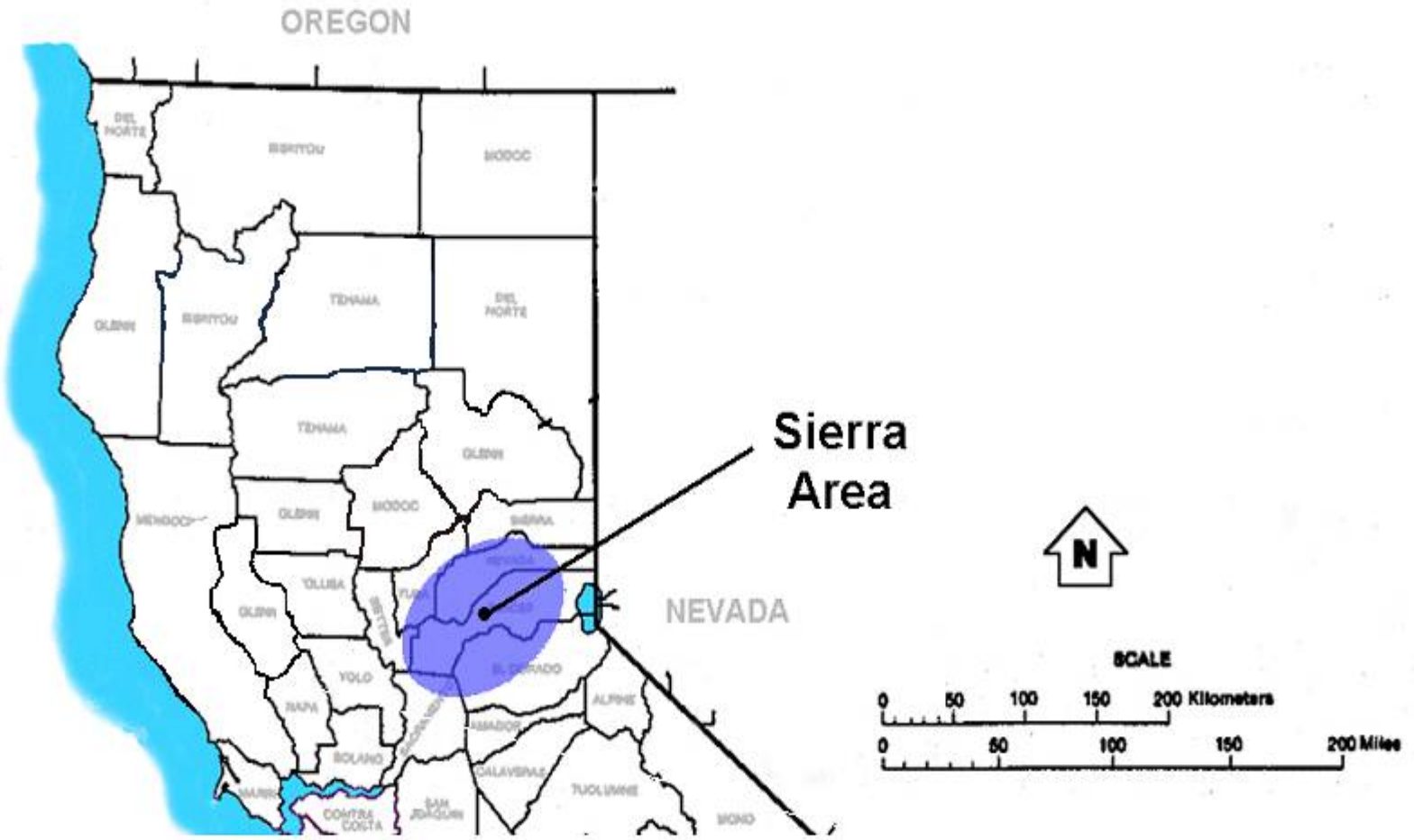
Sierra RMR Area



Sierra Area Load and Resources

(MW)

		2008
Load	=	1983
Transmission Losses	=	108
Total Load	=	**2091**
Market Generation	=	766
Muni Generation	=	800
QF Generation	=	214
Total Qualifying Capacity	=	**1780**

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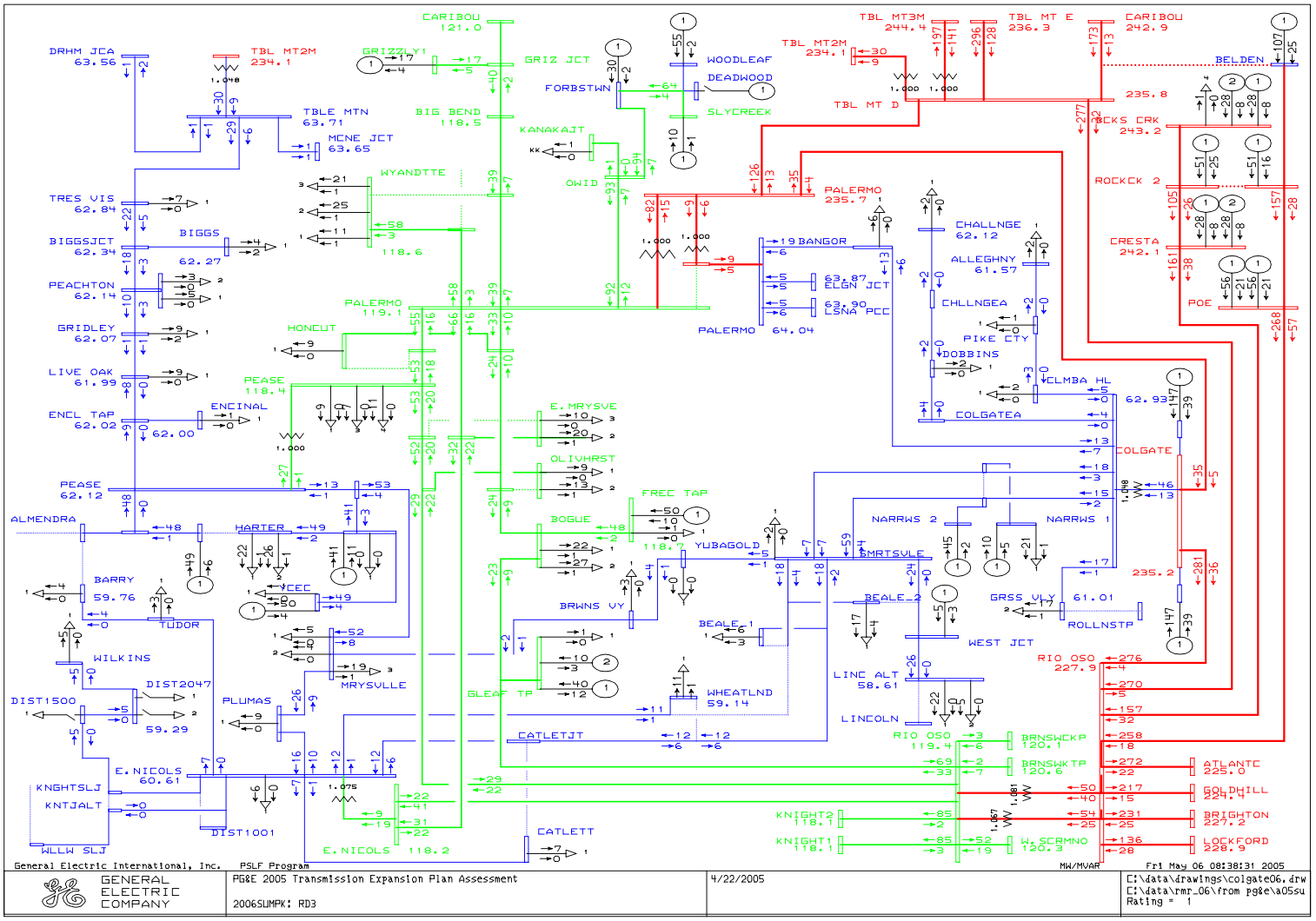

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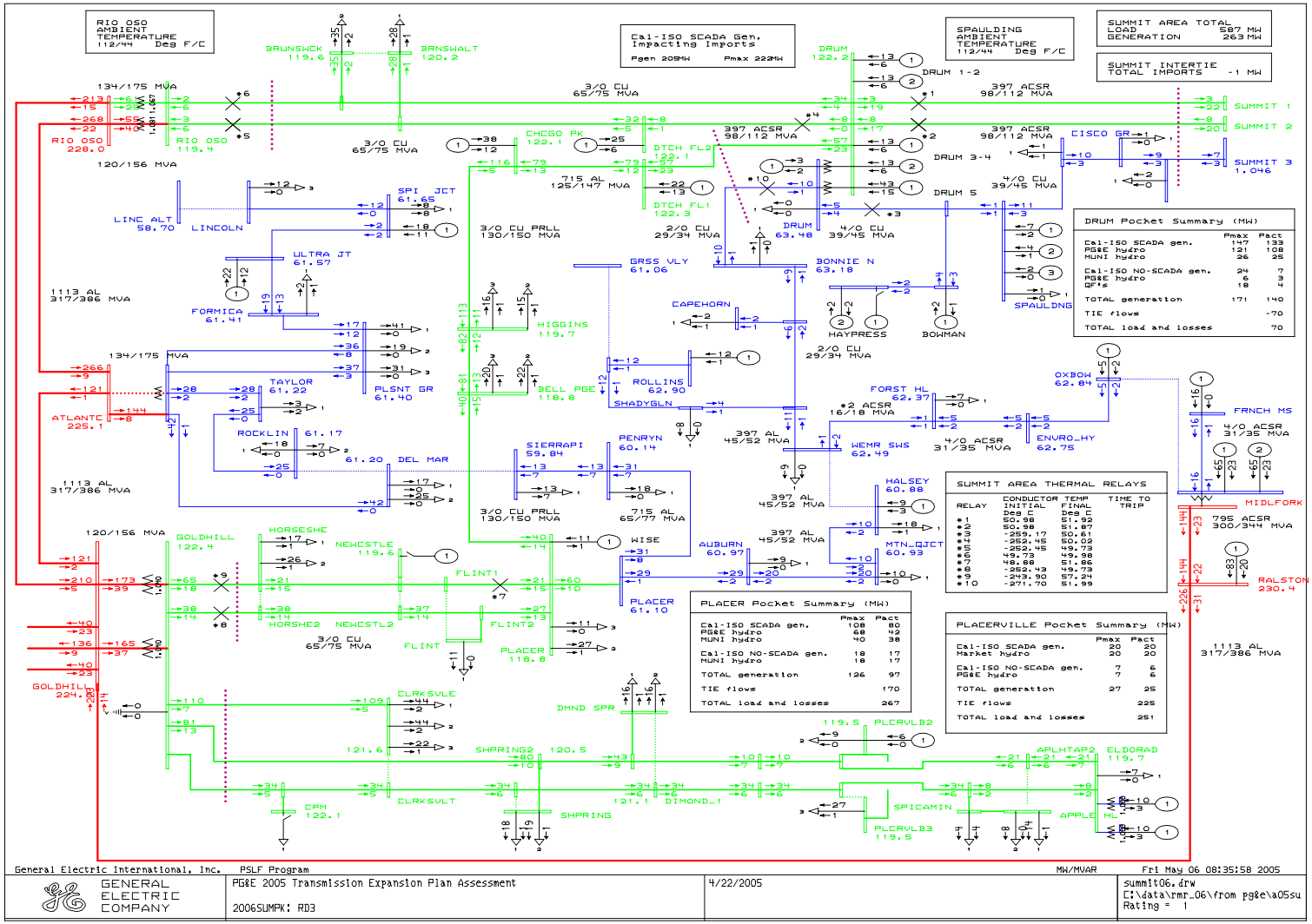

Critical Sierra Area Contingencies
South of Table Mountain & Colgate

South of Table Mountain Sub-area

Contingency: Table Mountain-Rio Oso 230 kV line with one of the Colgate Units out of service

LCR requirement: 1780 MW (includes 214 MW of QF and 800 MW of Muni generation)

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

No sub-area analysis is required. Done for planning purposes only.

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.

Critical Sierra Area Contingencies
Pease & Bogue

Pease Sub-area

Contingency: Palermo-East Nicolaus 115 kV line with one of the Yuba City Co-gen unit out of service

LCR requirement: 145 MW (includes 96 MW of QF and 3 MW of deficiency)

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

Critical Sierra Area Contingencies
South of Palermo

South Of Palermo Sub-area

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

LCR requirement: 1275 MW (includes 475 MW of QF and Muni generation as well as 75 MW of Deficiency)

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

South Of Palermo Sub-area – Category B

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

LCR requirement: 1140 MW (includes 475 MW of QF and Muni generation)

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

Critical Sierra Area Contingencies
Drum-Rio Oso

Drum-Rio Oso Sub-area

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

LCR requirement: 831 MW (includes 411 MW of QF and Muni generation as well as 117 MW of Deficiency)

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

Drum-Rio Oso Sub-area – Category B

Contingency: Rio Oso #2 230/115 transformer

LCR requirement: 651 MW (includes 411 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

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

LCR requirement: 584 MW (includes 310 MW of QF and Muni generation as well as 197 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 requirement: 441 MW (includes 310 MW of QF and Muni generation as well as 72 MW of Deficiency)

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

Critical Sierra Area Contingencies
Placer

Placer Sub-area

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

LCR requirement: 148 MW (includes 0 MW of QF and Muni generation as well as 124 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 requirement: 51 MW (includes 0 MW of QF and Muni generation as well as 27 MW of Deficiency)

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

Critical Sierra Area Contingencies
Placerville

Placerville Sub-area

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

LCR requirement: 95 MW (includes 0 MW of QF and Muni generation as well as 66 MW of Deficiency)

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

Placerville Sub-area – Category B

Contingency: Gold Hill-Clarksville 115 kV line with one of the El Dorado units out of service

LCR requirement: 21 MW (includes 0 MW of QF and Muni generation)

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

Critical Sierra Area Contingencies Aggregate

	QF (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	214	800	766	1780

	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)	1780	89	1869
Category C (Multiple)	1780	312	2092

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 2007 LCR study

Total LCR Need has decreased

Mainly because of new transmission project:

1. Colgate 230/60 kV transformer upgrade
2. Second Pease-Marysville 60 kV line
3. Atlantic-Lincoln 115 kV upgrade
4. South of Palermo 115 kV reconductoring

Total Net Qualifying Capacity has decreased

Mainly because of updates to the historical output levels of QF generation in the area.