California ISO
Your Link to Power

California Independent
System Operator

2009-2011
LOCAL CAPACITY TECHNICAL ANALYSIS

REPORT
AND STUDY RESULTS

October 31, 2006

Local Capacity Technical Analysis
Overview and Study Results

I. Executive Summary

This Report provides a description of the 2009 and 2011 LCR Study objectives, inputs, methodologies and assumptions, and the important policy considerations that are presented by the study results.

The LCR requirements trend up by about 1%/year mainly due to load forecast increase. There are areas where already approved project will decrease the need. For comparison below you find the 2007, 2009 and 2011 total LCR requirements.

2007 Local Capacity Requirements

	Qualifying Capacity			2007 LCR Requirement Based on Category B			2007 LCR Requirement Based on Category C with operating procedure		
Local Area Name	**QF/ Muni (MW)**	**Market (MW)**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**
Humboldt	73	133	206	202	0	**202**	202	0	**202**
North Coast / North Bay	158	861	1019	582	0	**582**	582	0	**582**
Sierra	1072	776	1848	1833	205	**2038**	1833	328	**2161**
Stockton	314	257	571	432	0	**432**	536	53	**589**
Greater Bay	1314	5231	6545	4771	0	**4771**	4771	0	**4771**
Greater Fresno	575	2337	2912	2115	0	**2115**	2151	68	**2219**
Kern	978	31	1009	554	0	**554**	769	17	**786**
LA Basin	3510	7012	10522	8843	0	**8843**	8843	0	**8843**
Big Creek/ Ventura	N/A	N/A	N/A	N/A	N/A	**N/A**	N/A	N/A	**N/A**
San Diego	191	2741	2932	2781	0	**2781**	2781	0	**2781**
Total	**8185**	**19379**	**27564**	**22113**	**205**	**22318**	**22468**	**466**	**22934**

2009 Local Capacity Requirements

	Qualifying Capacity			2009 LCR Requirement Based on Category B			2009 LCR Requirement Based on Category C with operating procedure		
Local Area Name	**QF/ Muni (MW)**	**Market (MW)**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**
Humboldt	73	133	206	203	0	**203**	203	0	**203**
North Coast / North Bay	158	861	1019	706	0	**706**	706	0	**706**
Sierra	1072	776	1848	1848	107	**1955**	1848	465	**2313**
Stockton	314	257	571	521	9	**530**	571	197	**768**
Greater Bay	1314	5281	6595	4736	0	**4736**	4736	0	**4736**
Greater Fresno	575	2337	2912	2172	0	**2172**	2172	92	**2264**
Kern	978	31	1009	332	0	**332**	545	19	**564**
LA Basin	3784	7822	11606	8765*	0	**8765***	8765*	0	**8765***
Big Creek/ Ventura	1137	4113	5250	3480	0	**3480**	3765	0	**3765**
San Diego	191	3342	3533	3024	0	**3024**	3024	0	**3024**
Total	**9596**	**24953**	**34549**	**25787**	**116**	**25903**	**26335**	**773**	**27108**

2011 Local Capacity Requirements

	Qualifying Capacity			2011 LCR Requirement Based on Category B			2011 LCR Requirement Based on Category C with operating procedure		
Local Area Name	**QF/ Muni (MW)**	**Market (MW)**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**	**Existing Capacity Needed**	**Deficiency**	**Total (MW)**
Humboldt	73	133	206	206	0	**206**	206	0	**206**
North Coast / North Bay	158	861	1019	641	0	**641**	641	0	**641**
Sierra	1072	776	1848	1848	217	**2065**	1848	622	**2470**
Stockton	314	257	571	521	40	**561**	571	329	**900**
Greater Bay	1314	6471	7785	4807	0	**4807**	4807	0	**4807**
Greater Fresno	575	2337	2912	2187	0	**2187**	2187	109	**2296**
Kern	978	31	1009	364	0	**364**	580	20	**600**
LA Basin	3784	7822	11606	9525*	0	**9525***	9525*	0	**9525***
Big Creek/ Ventura	1137	4113	5250	3795	0	**3795**	4140	0	**4140**
San Diego	191	3342	3533	2190*	0	**2190***	2190*	0	**2190***
Total	**9596**	**26143**	**35739**	**26084**	**257**	**26341**	**26695**	**1080**	**27775**

* - Potentially higher requirements combined with another area (see detail description).

The term “Qualifying Capacity” used in this report represents the “Gross Qualifying Capacity” (as of 1/12/2006) and it may be slightly higher, for certain generators, then the “Net Qualifying Capacity” as presented in the official list stored at:

http://www.caiso.com/1796/179694f65b9f0.xls

The difference between the terms “Qualifying Capacity” and “Net Qualifying Capacity” is that certain units have associated plant load and thus, the “Net Qualifying Capacity” represents the output from the unit after the plant load has been subtracted. However, the LCR Study incorporates the plant load from these units into the “total load” calculation.

The first column, “Qualifying Capacity”, reflects two sets of generation. The first set is comprised of generation that would normally be expected to be on-line such as Municipal generation and Regulatory Must-take generation (State, Federal, QFs and nuclear units). The second set is “market” generation. The second column, “2007 LCR Requirement Based on Category B” identifies the local capacity requirements, and deficiencies that must be addressed, in order to achieve a service reliability level based on Performance Criteria- Category B. The third column, “2007 LCR Requirement Based on Category C with Operating Procedure”, sets forth the local capacity requirements, and deficiencies that must be addressed, necessary to attain a service reliability level based on Performance Criteria-Category C with operational solutions.

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II. Overview of The Study: Inputs, Outputs and Options

A. Objectives

Similar to the 2006 Local Capacity Technical Analysis ("2006 LCR Study"), and the 2007 LCR Study the purpose of the 2009-2011 LCR Study is to identify specific areas within the CAISO Controlled Grid that have local reliability problems and to determine the generation capacity (MW) that would be required to mitigate these local reliability problems.

B. Key Study Assumptions

Inputs and Methodology

The CAISO used the same Inputs and Methodology as does agreed upon by interested parties at the CPUC meet and confer session previously incorporated into the 2007 LCR Study. The meet and confer session was held on February 17, 2006 and, as noted above, the agreed-upon input scenarios were submitted by the CAISO on February 22, 2006. An errata to the February 22 filing was submitted on March 10, 2006. The following table sets forth a summary of the approved inputs and methodology that have been used in the previous 2007 LCR Study as well as this 2009 and 2011 LCR Study:

Summary Table of Inputs and Methodology Used in this LCR Study:

Issue:	HOW INCORPORATED INTO THIS LCR STUDY:
Input Assumptions:	
• Transmission System Configuration	The existing transmission system has been modeled, including all projects operational on or before June 1, of the study year and all other feasible operational solutions brought forth by the PTOs and as agreed to by the CAISO.
• Generation Modeled	The existing generation resources has been modeled and also includes all projects that will be on-line and commercial on or before June 1, of the study year
• Load Forecast	Uses a 1-in-10 year summer peak load forecast
Methodology:	
• **Maximize Import Capability**	Import capability into the load pocket has been maximized, thus minimizing the generation required in the load pocket to meet applicable reliability requirements.
• **QF/Nuclear/State/Federal Units**	Regulatory Must-take and similarly situated units like QF/Nuclear/State/Federal resources have been modeled on-line at qualifying capacity output values for purposes of this LCR Study.
• **Maintaining Path Flows**	Path flows have been maintained below all established path ratings into the load pockets, including the 500 kV. For clarification, given the existing transmission system configuration, the only 500 kV path that flows directly into a load pocket and will, therefore, be considered in this LCR Study is the South of Lugo transfer path flowing into the LA Basin.
Performance Criteria:	
• **Performance Level B & C, including incorporation of PTO operational solutions**	This LCR Study is being published based on Performance Level B and Performance Level C criterion, yielding the low and high range LCR scenarios. In addition, the CAISO will incorporate all new projects and other feasible and CAISO-approved operational solutions brought forth by the PTOs that can be operational on or before June 1, of the study year. Any such solutions that can reduce the need for procurement to meet the Performance Level C criteria will be incorporated into the LCR Study.
Load Pocket:	
• **Fixed Boundary, including limited reference to published effectiveness factors**	This LCR Study has been produced based on load pockets defined by a fixed boundary. The CAISO only publishes effectiveness factors where they are useful in facilitating procurement where excess capacity exists within a load pocket.

Further details regarding the 2007 as well as 2009 and 2001 LCR Study methodology and assumptions are provided in Section III, below.

C. Grid Reliability

Service reliability builds from grid reliability because grid reliability is reflected in the planning standards of the Western Electricity Coordinating Council ("WECC") that incorporate standards set by the North American Electric Reliability Council ("NERC") (collectively "NERC Planning Standards"). The NERC Planning Standards primarily apply to the bulk, interconnected electric system in the Western United States and are intended to address the reality that within an integrated network, whatever one control area does can affect the reliability of other control areas. Consistent with the mandatory nature of the NERC Planning Standards, the CAISO is under a statutory obligation to ensure efficient use and reliable operation of the transmission grid consistent with achievement of the NERC Planning Standards.[1] The CAISO is further under an obligation, pursuant to its FERC-approved Transmission Control Agreement, to secure compliance with all "Applicable Reliability Criteria." Applicable Reliability Criteria consists of the NERC Planning Standards as well as reliability criteria adopted by the CAISO, in consultation with the CAISO's Participating Transmission Owners ("PTOs"), which affect a PTO's individual system.

The NERC Planning Standards define reliability on interconnected bulk electric systems using the terms "adequacy" and "security." "Adequacy" is the ability of the electric systems to supply the aggregate electrical demand and energy requirements of their customers at all times, taking into account physical characteristics of the transmission system such as transmission ratings and scheduled and reasonably expected unscheduled outages of system elements. "Security" is the ability of the electric systems to withstand sudden disturbances such as electric short circuits or unanticipated loss of system elements. The NERC Planning Standards are organized by Performance Categories. For instance, one category could require that the grid operator not only ensure grid integrity is maintained under certain adverse system conditions, e.g., security, but also that all customers continue to receive electric supply

[1] Pub. Utilities Code § 345

to meet demand, e.g., adequacy. In that case, grid reliability and service reliability would overlap. But there are other levels of performance where security can be maintained without ensuring adequacy.

Performance Criteria

As set forth on the Summary Table of Inputs and Methodology, this LCR Report is based on NERC Performance Level B and Performance Level C criterion, yielding the low and high range LCR scenarios. These Performance Levels can be described as follows:

i. Performance Criteria- Category B

Category B describes the system performance that is expected immediately following the loss of a single transmission element, such as a transmission circuit, a generator, or a transformer.

Category B system performance requires that all thermal and voltage limits must be within their "Applicable Rating," which, in this case, are the emergency ratings as generally determined by the PTO or facility owner. Applicable Rating includes a temporal element such that emergency ratings can only be maintained for a certain duration. Under this category, load cannot be shed in order to assure the Applicable Ratings are met however there is no guaranty that facilities are returned to within normal ratings or to a state where it is safe to continue to operate the system in a reliable manner, such that the next element out will no cause a violation of the applicable ratings and criteria.

ii. Performance Criteria- Category C

The NERC Standards require system operators to "look forward" to make sure they safely prepare for the "next" N-1 following the loss of the "first" N-1 (stay within Applicable Ratings after the "next" N-1). This is commonly referred to as N-1-1. Because it is assumed that some time exists between the "first" and "next" element

losses, operating personnel may make any reasonable and feasible adjustments to the system to prepare for the loss of the second element, including, operating procedures, dispatching generation, moving load from one substation to another to reduce equipment loading, dispatching operating personnel to specific station locations to manually adjust load from the substation site, or installing a "Special Protection Scheme" that would remove pre-identified load from service upon the loss of the "next " element.[2] All Category C requirements in this report only refer to situations when in real time (N-0) or after the first contingency (N-1) the system requires additional readjustment in order to prepare for the next worst contingency. In this time frame load drop is not allowed per existing planning criteria.

Generally Category C describes system performance that is expected following the loss of two or more system elements. This loss of two elements is generally expected to happen simultaneously, referred to as N-2. It should be noted that once the "next" element is lost after the first contingency, as discussed above under the Performance Criteria B, N-1-1 scenario, the event is effectively a Category C. As noted above, depending on system design and expected system impacts, the **planned and controlled** interruption of supply to customers (load shedding), the removal from service of certain generators and curtailment of exports may be utilized to maintain grid "security."

D. The Two Options Presented In This LCR Study

This LCR study sets forth different solution "options" with varying ranges of potential service reliability consistent with CAISO's Applicable Reliability Criteria:

1. Option 1- Meet Performance Criteria Category B

[2] A Special Protection Scheme is typically proposed as an operational solution that does not require additional generation and permits operators to effectively prepare for the next event as well as ensure security should the next event occur. However, these systems have their own risks, which limit the extent to which they could be deployed as a solution for grid reliability augmentation. While they provide the value of protecting against the next event without the need for pre-contingency load shedding, they add points of potential failure to the transmission network. This increases the potential for load interruptions because sometimes these systems will operate when not required and other times they will not operate when needed.

Option 1 is a service reliability level that reflects generation capacity that must be available to comply with reliability standards immediately after a NERC Category B given that load cannot be removed to meet this performance standard under Applicable Reliability Criteria. However, this capacity amount implicitly relies on load interruption as the **only means** of meeting any Applicable Reliability Criteria that is beyond the loss of a single transmission element (N-1). These situations will likely require substantial load interruptions in order to maintain system continuity and alleviate equipment overloads including load interruptions prior to the actual occurrence of the second contingency.[3]

2. Option 2- Meet Performance Criteria Category C and Incorporate Suitable Operational Solutions

Option 2 is a service reliability level that reflects generation capacity that is needed to readjust the system to prepare for the loss of a second transmission element (N-1-1) using generation capacity *after* considering all reasonable and feasible operating solutions (involving customer load interruption) developed and approved by the CAISO, in consultation with the PTOs. Under this option, there is no expected load interruption to end-use customers under normal or single contingency conditions as the CAISO operators prepare for the second contingency. However, the customer load will be interrupted in the event the second contingency occurs.

III. Assumption Details: How the Study was Conducted

A. System Planning Criteria

The following table provides a comparison of system planning criteria, based on the NERC performance standards, used in the study:

3 This potential for pre-contingency load shedding also occurs because real time operators must prepare for the loss of a common mode N-2 at all times.

Table 1: Criteria Comparison

Contingency Component(s)	ISO Grid Planning Criteria	Existing RMR Criteria	Locational Capacity Criteria
A – No Contingencies	X	X	X
B – Loss of a single element			
1. Generator (G-1)		X	X[1]
2. Transmission Circuit (L-1)	X	X	X[1]
3. Transformer (T-1)	X	X[2]	X[1,2]
4. Single Pole (dc) Line	X	X	X[1]
5. G-1 system readjusted L-1	X	X	X
C – Loss of two or more elements			
1. Bus Section	X		
2. Breaker (failure or internal fault)	X		
3. L-1 system readjusted G-1	X		X
3. G-1 system readjusted T-1 or T-1 system readjusted G-1	X		X
3. L-1 system readjusted T-1 or T-1 system readjusted L-1	X		X
3. G-1 system readjusted G-1	X		X
3. L-1 system readjusted L-1	X		X
3. T-1 system readjusted T-1	X		
4. Bipolar (dc) Line	X		X
5. Two circuits (Common Mode) L-2	X		X
6. SLG fault (stuck breaker or protection failure) for G-1	X		
7. SLG fault (stuck breaker or protection failure) for L-1	X		
8. SLG fault (stuck breaker or protection failure) for T-1	X		
9. SLG fault (stuck breaker or protection failure) for Bus section	X		
WECC-S3. Two generators (Common Mode) G-2	X[3]		X
D – Extreme event – loss of two or more elements			
Any B1-4 system readjusted (Common Mode) L-2	X[4]		X[3]
All other extreme combinations D1-14.	X[4]		

1 System must be able to readjust to a safe operating zone in order to be able to support the loss of the next contingency.

2 A thermal or voltage criterion violation resulting from a transformer outage may not be cause for a local area reliability requirement if the violation is considered marginal (e.g. acceptable loss of facility life or low voltage), otherwise, such a violation will necessitate creation of a requirement.

3 Evaluate for risks and consequence, per NERC standards. No voltage collapse or dynamic instability allowed.

4 Evaluate for risks and consequence, per NERC standards.

A significant number of simulations were run to determine the most critical contingencies within each Local Capacity Area. Using power flow, post-transient load flow, and stability assessment tools, the system performance results of all the contingencies that were studied were measured against the system performance requirements defined by the criteria shown in Table 1. Where the specific system performance requirements were not met, generation was adjusted such that the minimum amount of generation required to meet the criteria was determined in the Local Capacity Area. The following describes how the criteria were tested for the specific type of analysis performed.

1. Power Flow Assessment:

Contingencies	Thermal Criteria[3]	Voltage Criteria[4]
Generating unit [1, 6]	Applicable Rating	Applicable Rating
Transmission line [1, 6]	Applicable Rating	Applicable Rating
Transformer [1, 6]	Applicable Rating[5]	Applicable Rating[5]
(G-1)(L-1) [2, 6]	Applicable Rating	Applicable Rating
Overlapping [6, 7]	Applicable Rating	Applicable Rating

1 All single contingency outages (i.e. generating unit, transmission line or transformer) will be simulated on Participating Transmission Owners' local area systems.

2 Key generating unit out, system readjusted, followed by a line outage. This over-lapping outage is considered a single contingency within the ISO Grid Planning Criteria. Therefore, load dropping for an overlapping G-1, L-1 scenario is not permitted.

3 Applicable Rating – Based on ISO Transmission Register or facility upgrade plans including established Path ratings.

4 Applicable Rating – ISO Grid Planning Criteria or facility owner criteria as appropriate including established Path ratings.

5 A thermal or voltage criterion violation resulting from a transformer outage may not be cause for a local area reliability requirement if the violation is considered marginal (e.g. acceptable loss of facility life or low voltage), otherwise, such a violation will necessitate creation of a requirement.

6 Following the first contingency (N-1), the generation must be sufficient to allow the operators to bring the system back to within acceptable (normal) operating range (voltage and loading) and/or appropriate OTC following the studied outage conditions.

7 During normal operation or following the first contingency (N-1), the generation must be sufficient to allow the operators to prepare for the next worst N-1 or common mode N-2 without pre-contingency interruptible or firm load shedding. SPS/RAS/Safety Nets may be utilized to satisfy the criteria after the second N-1

or common mode N-2 except if the problem is of a thermal nature such that short-term ratings could be utilized to provide the operators time to shed either interruptible or firm load. T-2s (two transformer bank outages) would be excluded from the criteria.

2. Post Transient Load Flow Assessment:

Contingencies **Selected** [1]	Reactive Margin Criteria [2] **Applicable Rating**

[1] If power flow results indicate significant low voltages for a given power flow contingency, simulate that outage using the post transient load flow program. The post-transient assessment will develop appropriate Q/V and/or P/V curves.

[2] Applicable Rating – positive margin based on the higher of imports or load increase by 5% for N-1 contingencies, and 2.5% for N-2 contingencies.

3. Stability Assessment:

Contingencies **Selected** [1]	Stability Criteria [2] **Applicable Rating**

[1] Base on historical information, engineering judgment and/or if power flow or post transient study results indicate significant low voltages or marginal reactive margin for a given contingency.

[2] Applicable Rating – ISO Grid Planning Criteria or facility owner criteria as appropriate.

B. Load Forecast

1. System Forecast

The load forecast at the system as well as PTO levels originates from California Energy Commission (CEC). This most recent CEC forecast is then distributed across the entire system, down to the local area, division and substation level. PTO's use an econometric equation to forecast the system load. The predominant parameters affecting the system load are (1) number of households, (2) economic activity (gross metropolitan products, GMP), (3) temperature and (4) increased energy efficiency and distributed generation programs.

2. Base Case Load Development Method

The method used to develop the base case loads is a melding process that extracts, adjusts and modifies the information from the system, distribution and muni forecasts. The melding process consists of two parts. Part 1 deals with the PTO load. Part 2 deals with the muni load. There may be small differences between the methodologies used by each PTO to disaggregate the CEC load forecast to their level of local area as well as bar-bus model; please refer to each PTO expansion plan for additional details.

a. PTO Loads in Base Case

The methods used to determine the PTO loads are for the most part similar. One part of the method deals with the determination of the division loads that would meet the requirements of 1-in-5 or 1-in-10 system or area base cases and the other part deals with the allocation of the division load to the transmission buses.

i. Determination of division loads

The annual division load is determined by summing the previous year division load and the current division load growth. Thus the key steps are the determination of the initial year division load and the annual load growth. The initial year for the base case development method is based heavily on recorded data. The division load growth in the system base case is determined in two steps. First, the total PTO load growth for the year is determined, as the product of the PTO load and the load growth rate from the system load forecast. Then this total PTO load growth is allocated to the division, based on the relative magnitude of the load growths projected for the divisions by the distribution planners. For example the 1-in-10 area base case, the division load growth determined for the system base case is adjusted to the 1-in-10 temperature using the load temperature relation determined from the latest peak load and temperature data of the division.

ii. Allocation of division load to transmission bus level

Since the base case loads are modeled at the various transmission buses, the division loads developed would need to be allocated to those buses. The allocation

process is different depending on the load types. For the most part each PTO's classifies its loads into four types: conforming, non-conforming, self-generation and generation-plant loads. Since the non-conforming and self-generation loads are assumed to not vary with temperature, their magnitude would be the same in the system or area base cases of the same year. The remaining load (the total division load developed above, less the quantity of non-conforming and self-generation load) is the conforming load. The remaining load would be allocated to the transmission buses based on the relative magnitude of the distribution forecast. The summation of all base case loads usually is higher then the load forecast because some load like self-generation and generation-plant are load behind the meter and they need to be modeled in the base cases, however for the most part metered or aggregated data with telemetry is used to come up with the load forecast.

b. Municipal Loads in Base Case

The muni forecasts provided to the PTOs for the purposes of their base cases were used for this study.

C. Power Flow Program Used in the LCR analysis

The LCR technical studies were conducted using General Electric's Power System Load Flow (GE PSLF) program version 15.2. This E PSLF program is available directly from GE or through the Western System Electricity Council (WECC) to any member.

To complete the local area component of this study, the starting base case was adjusted to reflect the latest generation and transmission projects as well as the one-in-ten-year peak load forecast for each local area as provided to the ISO by the Participating Transmission Owners ("PTOs").

Electronic contingency files provided by the PTOs were utilized to perform the numerous contingencies required to identify the LCR needs. These contingency files include remedial action and special protection schemes that are expected to be in operation during the year of study. An CAISO created EPCL (a GE programming language contained within the GE PSLF package) routine was used to run the

combination of contingencies; however, other routines are available from WECC with the GE PSFL package or can be developed by third parties to identify the most limiting combination of contingencies requiring the highest amount of generation within the local area to maintain power flows within applicable ratings.

IV. Locational Capacity Requirement Study Results

A. Summary of Study Results

The LCR results reflect two sets of generation. The first set is comprised of generation that would normally be expected to be on-line such as Municipal generation and Regulatory Must-take generation (State, Federal, QFs and nuclear units). The second set is "market" generation. Within this overview, LCR is defined as the amount of generating capacity that is required within a Local Capacity Area to reliably serve the load located within this area. The results of the CAISO's analysis are summarized in the Executive Summary Tables.

Table 4: 2007 Local Capacity Requirements vs. Peak Load and Local Area Generation

	2007 Total LCR (MW)	Peak Load (1 in10) (MW)	2007 LCR as % of Peak Load	Total Dependable Local Area Generation (MW)	2007 LCR as % of Total Area Generation
Humboldt	202	197	103%	206	98%
North Coast/North Bay	582	1,513	38%	1,019	57%
Sierra	2,161	1,841	117%	1,848	117%**
Stockton	589	1,267	46%	571	103%**
Greater Bay	4,771	9,633	50%	6,545	73%
Greater Fresno	2,219	3,154	70%	2,912	76%**
Kern	786	1,209	65%	1,009	78%**
LA Basin	8,843	19,325	46%	10,522	84%
Big Creek/Ventura	N/A	N/A	N/A	N/A	N/A
San Diego	2,781	4,742	59%	2,932	95%
Total	**22,934**	**42,881***	**53%***	**27,471**	**83%**

Table 5: 2009 Local Capacity Requirements vs. Peak Load and Local Area Generation

	2009 Total LCR (MW)	Peak Load (1 in10) (MW)	2009 LCR as % of Peak Load	Total Dependable Local Area Generation (MW)	2009 LCR as % of Total Area Generation
Humboldt	203	201	101%	206	99%
North Coast/North Bay	706	1,502	47%	1,019	69%
Sierra	2,313	2,121	109%	1,848	125%**
Stockton	768	1,348	57%	571	135%**
Greater Bay	4,736	9,878	48%	6,595	72%
Greater Fresno	2,264	3,296	69%	2,912	78%**
Kern	564	1,217	46%	1,009	56%**
LA Basin	8,765	19,377	45%	11,606	76%
Big Creek/Ventura	3,765	4,983	76%	5,250	72%
San Diego	3,024	4,963	61%	3,533	86%
Total	**27,108**	**48,886***	**55%***	**34,549**	**78%**

Table 6: 2011 Local Capacity Requirements vs. Peak Load and Local Area Generation

	2011 Total LCR (MW)	Peak Load (1 in10) (MW)	2011 LCR as % of Peak Load	Total Dependable Local Area Generation (MW)	2011 LCR as % of Total Area Generation
Humboldt	206	205	100%	206	100%
North Coast/North Bay	641	1,555	41%	1,019	63%
Sierra	2,470	2,213	112%	1,848	134%**
Stockton	900	1,398	64%	571	158%**
Greater Bay	4,807	10,127	47%	6,595	73%
Greater Fresno	2,296	3,396	68%	2,912	79%**
Kern	600	1,249	48%	1,009	59%**
LA Basin	9,525	20,236	47%	11,606	82%
Big Creek/Ventura	4,140	5,245	79%	5,250	79%
San Diego	2,190	5,129	43%	3,533	62%
Total	**27,775**	**50,753***	**55%***	**34,549**	**80%**

* Value shown only illustrative, since each local area peaks at a different time.

** Generation deficient LCA (or with sub-area that are deficient) – deficiency included in LCR. Generator deficient area implies that in order to comply with the criteria, at summer peak, load must be shed immediately after the first contingency.

Tables 4, 5 and 6 shows how much of the local area load is dependent on local generation and how much local generation needs to be available in order to reliably (see LCR criteria) serve the load in those Local Capacity Areas. These tables also indicates where new transmission projects, new generation additions or demand side management programs would be most useful in order to reduce the dependency on existing (mostly old and inefficient) local area generation.

B. Summary of Results by Local Area

Each local area's overall requirement is determined by also achieving each sub-area requirement. Because these areas are a part of the interconnected electric system, the total for each local area is not simply a summation of the sub-area requirements. For example, some sub-areas may overlap and therefore the same units have been counted toward both sub-area requirements. Of course some sub-areas requirements are directly counted toward the total requirements of a bigger local area or the overall area.

1. Humboldt Area

Area Definition

The transmission tie lines into the area include:

1) Bridgeville-Cottonwood 115 kV line #1
2) Humboldt-Trinity 115 kV line #1
3) Willits-Garberville 60 kV line #1
4) Trinity-Maple Creek 60 kV line #1

The substations that delineate the Humboldt Area are:

1) Bridgeville is in Cottonwood and Low Gap are out
2) Humboldt is in Trinity is out
3) Willits and Kekawaka are out Garberville is in

4) Trinity and Ridge Cabin are out Maple Creek is in

Total 2009 busload within the defined area: 197 MW with 6 MW of losses resulting in total load + losses of 201 MW. Total 2011 busload within the defined area: 199 MW with 6 MW of losses resulting in total load + losses of 205 MW.

Total units and qualifying capacity available in this area:

Gen Bus	Gen Name	ID	Qualifying Capacity (MW)
31170	HMBOLDT1	1	51
31172	HMBOLDT2	1	52
31154	HUMBOLDT	1	15
31154	HUMBOLDT	2	15
31150	FAIRHAVN	1	17.2
31166	KEKAWAK	1	5.3
31158	LP SAMOA	1	25
31152	PAC.LUMB	2	12.5
31152	PAC.LUMB	1	12.5
	Total		**205.5**

Critical Contingency Analysis Summary

Humboldt overall:

The most critical contingency for the Humboldt area is the outage of the Bridgeville-Cottonwood 115 kV line over-lapping with an outage of one Humboldt Bay Power Plant. The local area limitation is low voltage and reactive power margin. This contingency establishes a Local Capacity Requirement of 203 MW in 2009 and 206 MW in 2011 (includes 73 MW of QF/Selfgen generation) as the minimum capacity necessary for reliable load serving capability within this area.

Effectiveness factors:

All units within this area have the same effectiveness factor. Units outside of this area are not effective.

Humboldt Overall Requirements:

	QF/Selfgen (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	73	0	133	206

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[4]	203	0	203
Category C (Multiple)[5]	203	0	203

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[4]	206	0	206
Category C (Multiple)[5]	206	0	206

2. North Coast / North Bay Area

Area Definition

The North Coast/North Bay Area is composed of three sub-areas and the generation requirements within them.

The transmission tie facilities coming into the North Coast/North Bay area are:

1) Cortina-Mendocino 115 kV Line
2) Cortina-Eagle Rock 115 kV Line
3) Willits-Garberville 60 kV line #1
4) Vaca Dixon-Lakeville 230 kV line #1
5) Tulucay-Vaca Dixon 230 kV line #1
6) Lakeville-Sobrante 230 kV line #1
7) Ignacio-Sobrante 230 kV line #1

The substations that delineate the North Coast/North Bay area are:

1) Cortina is out Mendocino and Indian Valley are in
2) Cortina is out Eagle Rock , Highlands and Homestake are in
3) Willits and Kekawaka are in Garberville is out
4) Vaca Dixon is out Lakeville is in
5) Tulucay is in Vaca Dixon is out
6) Lakeville is in Sobrante is out
7) Ignacio is in Sobrante and Crocket are out

[4] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[5] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

Total 2009 busload within the defined area: 1455 MW with 47 MW of losses resulting in total load + losses of 1502 MW. Total 2011 busload within the defined area: 1500 MW with 55 MW of losses resulting in total load + losses of 1555 MW.

Total units and qualifying capacity available in this area:

Gen Bus	Gen Name	ID	Qualifying Capacity (MW)
31433	POTTRVLY	3	2.5
31433	POTTRVLY	1	5.5
31433	POTTRVLY	4	2.5
31430	SMUDGEO1	1	38
31406	GEYSR5-6	1	36
31406	GEYSR5-6	2	36
31408	GEYSER78	1	31
31408	GEYSER78	2	31
31412	GEYSER11	1	60
31414	GEYSER12	1	41
31416	GEYSER13	1	70
31418	GEYSER14	1	63
31420	GEYSER16	1	75
31422	GEYSER17	1	51
31424	GEYSER18	1	40
31426	GEYSER20	1	40
38106	NCPA1GY1	1	59
38108	NCPA1GY2	1	59
38110	NCPA2GY1	1	60
38112	NCPA2GY2	1	60
31400	SANTA FE	2	39.1
31404	WEST FOR	2	14
31400	SANTA FE	1	39.1
31402	BEAR CAN	1	8.3
31402	BEAR CAN	2	8
31404	WEST FOR	1	14
32700	MONTICLO	1	3.3
32700	MONTICLO	2	3.4
32700	MONTICLO	3	0
31435	GEO.ENGY	1	8.6
31435	GEO.ENGY	2	8.9
31436	INDIAN V	1	3.7
31446	SONMA LF	1	7.7
	Total		**1018.6**

Critical Contingency Analysis Summary

Eagle Rock Sub-area

The most critical overlapping contingency is the outage of the Eagle Rock-Silverado-Fulton 115 kV line and the Cortina #4 230/115kV bank. The sub-area area limitation is thermal overloading of Fulton-Hopland 60kV. This limiting contingency establishes a Local Capacity Requirement of 217 MW in 2009 and 226 MW in 2011 (includes 21 MW of QF generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

The single most critical overlapping contingency is the outage of Cortina #4 230/115kV bank. The sub-area area limitation is thermal overloading of Fulton-Hopland 60kV. This limiting contingency establishes a Local Capacity Requirement of 110 MW in 2009 and 127 MW in 2011 (includes 21 MW of QF generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units within the Eagle-Rock pocket at least 5% effective to the above-mentioned constraint.

Overlapping Contingency

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)	Location
31406	GEYSR5-6	1	13	Eagle Rock
31406	GEYSR5-6	2	13	Eagle Rock
31408	GEYSER78	1	13	Eagle Rock
31408	GEYSER78	2	13	Eagle Rock
31412	GEYSER11	1	13	Eagle Rock

Fulton Sub-area

The most critical overlapping contingency is the outage of the Fulton-Ignacio 230 kV line #1 and the Fulton-Lakeville 230 kV line #1. The sub-area area limitation is thermal overloading of Sonoma-Pueblo 115 kV line #1. This limiting contingency establishes a Local Capacity Requirement of 382 MW in 2009 and 386 MW in 2011 (includes 80 MW of QF generation) as the minimum capacity necessary for reliable load serving

capability within this sub-area. All of the units required to meet the Eagle Rock pocket count towards the Fulton total requirement.

Effectiveness factors:

The following table has units within the Fulton pocket as well as units outside the pocket that are at least 5% effective to the above-mentioned constraint.

Overlapping Contingency

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)	Location
31404	WEST FOR	2	27	Fulton
31404	WEST FOR	1	27	Fulton
31414	GEYSER12	1	27	Fulton
31418	GEYSER14	1	27	Fulton
31420	GEYSER16	1	27	Fulton
31422	GEYSER17	1	27	Fulton
38110	NCPA2GY1	1	27	Fulton
38112	NCPA2GY2	1	27	Fulton
31406	GEYSR5-6	1	17	Eagle Rock
31406	GEYSR5-6	2	17	Eagle Rock
31408	GEYSER78	1	17	Eagle Rock
31408	GEYSER78	2	17	Eagle Rock
31412	GEYSER11	1	17	Eagle Rock

Lakeville Sub-area

The 2009 most limiting contingency is the outage of Vaca Dixon-Tulucay 230 kV line with DEC power plant out of service. The sub-area limitation is thermal overloading of the Vaca Dixon-Tulucay 230 kV. This limiting contingency establishes a Local Capacity Requirement of 706 MW (includes 158 MW of QF generation). The LCR requirement for Eagle Rock and Fulton sub-area can be counted toward fulfilling the requirement of Lakeville sub-area.

The 2011 most limiting contingency is the outage of Vaca Dixon-Lakeville 230 kV line with DEC power plant out of service. The sub-area limitation is thermal overloading of the Lakeville-Tulucay 230 kV. This limiting contingency establishes a Local Capacity Requirement of 641 MW (includes 158 MW of QF generation). The LCR requirement for Eagle Rock and Fulton sub-area can be counted toward fulfilling the requirement of Lakeville sub-area.

Effectiveness factors:

The following table has units at least 5% effective to the above-mentioned constraint.

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)	Location
31400	SANTA FE	2	25	Lakeville
31430	SMUDGEO1	1	25	Lakeville
31400	SANTA FE	1	25	Lakeville
31416	GEYSER13	1	25	Lakeville
31424	GEYSER18	1	25	Lakeville
31426	GEYSER20	1	25	Lakeville
38106	NCPA1GY1	1	25	Lakeville
38108	NCPA1GY2	1	25	Lakeville
31404	WEST FOR	2	22	Fulton
31404	WEST FOR	1	22	Fulton
31414	GEYSER12	1	22	Fulton
31418	GEYSER14	1	22	Fulton
31420	GEYSER16	1	22	Fulton
31422	GEYSER17	1	22	Fulton
38110	NCPA2GY1	1	22	Fulton
38112	NCPA2GY2	1	22	Eagle Rock
31406	GEYSR5-6	1	8	Eagle Rock
31406	GEYSR5-6	2	8	Eagle Rock
31408	GEYSER78	1	8	Eagle Rock
31408	GEYSER78	2	8	Eagle Rock
31412	GEYSER11	1	8	Eagle Rock

North Coast/North Bay Overall Requirements:

	QF/Seflgen (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	158	0	861	1019

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[6]	706	0	706
Category C (Multiple)[7]	706	0	706

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[6]	641	0	641
Category C (Multiple)[7]	641	0	641

[6] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

[7] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

3. Sierra Area

Area Definition

The transmission tie lines into the Sierra Area are:

1) Table Mountain-Rio Oso 230 kV line
2) Table Mountain-Palermo 230 kV line
3) Table Mt-Pease 60 kV line
4) Caribou-Palermo 115 kV line
5) Drum-Summit 115 kV line #1
6) Drum-Summit 115 kV line #2
7) Spaulding-Summit 60 kV line
8) Brighton-Bellota 230 kV line
9) Rio Oso-Lockeford 230 kV line
10) Gold Hill-Eight Mile Road 230 kV line
11) Gold Hill-Lodi Stig 230 kV line
12) Gold Hill-Lake 230 kV line

The substations that delineate the Sierra Area are:

1) Table Mountain is out Rio Oso is in
2) Table Mountain is out Palermo is in
3) Table Mt is out Pease is in
4) Caribou is out Palermo is in
5) Drum is in Summit is out
6) Drum is in Summit is out
7) Spaulding is in Summit is out
8) Brighton is in Bellota is out
9) Rio Oso is in Lockeford is out
10) Gold Hill is in Eight Mile is out
11) Gold Hill is in Lodi Stig is out
12) Gold Hill is in Lake is out

Total 2009 busload within the defined area: 2011 MW with 110 MW of losses resulting in total load + losses of 2121 MW. Total 2011 busload within the defined area: 2092 MW with 121 MW of losses resulting in total load + losses of 2213 MW.

Total units and qualifying capacity available in this area:

Gen No	Gen Name	ID	Qualifying Capacity
31888	OROVLLE	1	8.9
31890	PO POWER	2	9.8
31890	PO POWER	1	9.8
31834	KELLYRDG	1	10
31814	FORBSTWN	1	39.7
31794	WOODLEAF	1	55
31862	DEADWOOD	1	2

31832	SLY.CR.	1	13.2
32470	CMP.FARW	1	6.5
32450	COLGATE1	1	165.8
32452	COLGATE2	1	165.7
32466	NARROWS1	1	3.6
32468	NARROWS2	1	10.1
32451	FREC	1	47
32490	GRNLEAF1	2	10
32490	GRNLEAF1	1	51.1
32156	WOODLAND	1	28.6
32494	YUBA CTY	1	50.2
32496	YCEC	1	47
32492	GRNLEAF2	1	50.3
32166	UC DAVIS	1	3.5
31812	CRESTA	1	35
31812	CRESTA	2	35
31788	ROCK CK2	1	56
31820	BCKS CRK	1	33
31820	BCKS CRK	2	25
31790	POE 1	1	60
31792	POE 2	1	60
31786	ROCK CK1	1	56
31784	BELDEN	1	115
32162	RIV.DLTA	1	3.1
32502	DTCHFLT2	1	26
32476	ROLLINSF	1	11.7
32474	DEER CRK	1	5.7
32454	DRUM 5	1	49.5
32504	DRUM 1-2	1	13
32504	DRUM 1-2	2	13
32506	DRUM 3-4	1	14
32506	DRUM 3-4	2	14
32484	OXBOW F	1	6
32472	SPAULDG	1	4.4
32472	SPAULDG	2	7
32472	SPAULDG	3	5.8
32498	SPILINCF	1	13.7
32464	DTCHFLT1	1	22
32500	ULTR RCK	1	28.5
32480	BOWMAN	1	3.8
32488	HAYPRES+	1	12.3
32488	HAYPRES+	2	8.7
32462	CHI.PARK	1	38
32478	HALSEY F	1	11
32512	WISE	1	10.8
32460	NEWCSTLE	1	5.9
32510	CHILIBAR	1	7
32513	ELDRADO1	1	10
32514	ELDRADO2	1	10
32458	RALSTON	1	86

32456	MIDLFORK	1	63.4
32456	MIDLFORK	2	63.4
32486	HELLHOLE	1	0.5
32508	FRNCH MD	1	17
	Total		**1848**

Critical Contingency Analysis Summary

South of Table Mountain Sub-area

The most critical contingency is the loss of the Table Mountain-Rio Oso 230 kV line with one of the Colgate Units out of service. The area limitation is thermal overloading of the Table Mt-Palermo 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 1860 MW (includes 1072 MW of QF and Muni generation as well as 12 MW of deficiency) in 2009 and 1955 MW (includes 1072 MW of QF and Muni generation as well as 107 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket.

The 2011 case also has a normal overload on the Table Mountain-Rio Oso 230 kV line. This limiting condition establishes a Local Capacity Requirement of 1720 MW (includes 924 MW of QF and Muni generation as well as 20 MW of deficiency).

Effectiveness factors:

All units within this area are needed therefore no effectiveness factor is required.

Gen No	Gen Name	ID	Qualifying Capacity
31888	OROVLLE	1	8.9
31890	PO POWER	2	9.8
31890	PO POWER	1	9.8
31834	KELLYRDG	1	10
31814	FORBSTWN	1	39.7
31794	WOODLEAF	1	55
31862	DEADWOOD	1	2
31832	SLY.CR.	1	13.2
32470	CMP.FARW	1	6.5
32450	COLGATE1	1	165.8
32452	COLGATE2	1	165.7
32466	NARROWS1	1	3.6
32468	NARROWS2	1	10.1
32451	FREC	1	47
32490	GRNLEAF1	2	10
32490	GRNLEAF1	1	51.1
32156	WOODLAND	1	28.6

32494	YUBA CTY	1	50.2
32496	YCEC	1	47
32492	GRNLEAF2	1	50.3
32166	UC DAVIS	1	3.5
31812	CRESTA	1	35
31812	CRESTA	2	35
31788	ROCK CK2	1	56
31820	BCKS CRK	1	33
31820	BCKS CRK	2	25
31790	POE 1	1	60
31792	POE 2	1	60
31786	ROCK CK1	1	56
31784	BELDEN	1	115
32162	RIV.DLTA	1	3.1
32502	DTCHFLT2	1	26
32476	ROLLINSF	1	11.7
32474	DEER CRK	1	5.7
32454	DRUM 5	1	49.5
32504	DRUM 1-2	1	13
32504	DRUM 1-2	2	13
32506	DRUM 3-4	1	14
32506	DRUM 3-4	2	14
32484	OXBOW F	1	6
32472	SPAULDG	1	4.4
32472	SPAULDG	2	7
32472	SPAULDG	3	5.8
32498	SPILINCF	1	13.7
32464	DTCHFLT1	1	22
32500	ULTR RCK	1	28.5
32480	BOWMAN	1	3.8
32488	HAYPRES+	1	12.3
32488	HAYPRES+	2	8.7
32462	CHI.PARK	1	38
32478	HALSEY F	1	11
32512	WISE	1	10.8
32460	NEWCSTLE	1	5.9
32510	CHILIBAR	1	7
32513	ELDRADO1	1	10
32514	ELDRADO2	1	10
32458	RALSTON	1	86
32456	MIDLFORK	1	63.4
32456	MIDLFORK	2	63.4
32486	HELLHOLE	1	0.5
32508	FRNCH MD	1	17
	Total		**1848**

Colgate Sub-area

No requirements due to the addition of the Atlantic-Lincoln 115 kV upgrade project.

Pease Sub-area

The most critical contingency is the loss of the Palermo-East Nicolaus 115 kV line with one of the Greenleaf #2 (or Yuba City) units out of service. The area limitation is thermal overloading of the Palermo-Pease 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 150 MW (includes 100 MW of QF generation) in 2009 and 182 MW in 2011 (includes 100 MW of QF generation as well as 32 MW of deficiency) as the minimum capacity necessary for reliable load serving capability within this pocket. It is assumed that Oliverhurst is normally served from Palermo-Bogue 115 kV line and not from Pease-Rio Oso 115 kV line.

Effectiveness factors:

All units within this area (Greenleaf #2, Yuba City and Yuba City EC) are needed therefore no effectiveness factor is required.

Bogue Sub-area

No requirements due to the addition of the South of Palermo 115 kV reconductoring project.

South of Palermo Sub-area

The most critical contingency is the loss of the Double Circuit Tower Line Table Mountain-Rio Oso and Colgate-Rio Oso 230 kV lines. The area limitation is thermal overloading of the Pease-Rio Oso 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 1320 MW (includes 475 MW of QF and Muni generation as well as 120 MW of deficiency) in 2009 and 1472 MW (includes 475 MW of QF and Muni generation as well as 272 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket. It is assumed that Oliverhurst is normally served from Palermo-Bogue 115 kV line and not from Pease-Rio Oso 115 kV line.

The single most critical contingency is the loss of the Palermo-East Nicolaus 115 kV line with Belden unit out of service. The area limitation is thermal overloading of the Pease-Rio Oso 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 1185 MW (includes 475 MW of QF and Muni generation) in 2009 and 1285 MW (includes 475 MW of QF and Muni as well as 85 MW of deficiency) in 2011. It is assumed that Oliverhurst is normally served from Palermo-Bogue 115 kV line and not from Pease-Rio Oso 115 kV line.

Effectiveness factors:

All units (listed below) within this area are needed therefore no effectiveness factor is required.

Gen No	Gen Name	ID	Qualifying Capacity
32156	WOODLAND	1	28.6
32166	UC DAVIS	1	3.5
32502	DTCHFLT2	1	26
32498	SPILINCF	1	13.7
32476	ROLLINSF	1	11.7
32484	OXBOW F	1	6
32474	DEER CRK	1	5.7
32504	DRUM 1-2	1	13
32504	DRUM 1-2	2	13
32506	DRUM 3-4	1	14
32506	DRUM 3-4	2	14
32454	DRUM 5	1	49.5
32472	SPAULDG	1	4.4
32472	SPAULDG	2	7
32472	SPAULDG	3	5.8
32488	HAYPRES+	1	12.3
32480	BOWMAN	1	3.8
32488	HAYPRES+	2	8.7
32464	DTCHFLT1	1	22
32500	ULTR RCK	1	28.5
32462	CHI.PARK	1	38
32162	RIV.DLTA	1	3.1
32478	HALSEY F	1	11
32512	WISE	1	10.8
32460	NEWCSTLE	1	5.9
32510	CHILIBAR	1	7
32514	ELDRADO2	1	10
32513	ELDRADO1	1	10
31784	BELDEN	1	115
31790	POE 1	1	60

31786	ROCK CK1	1	56
31792	POE 2	1	60
31812	CRESTA	1	35
31812	CRESTA	2	35
31788	ROCK CK2	1	56
31820	BCKS CRK	1	33
31820	BCKS CRK	2	25
32458	RALSTON	1	86
32456	MIDLFORK	1	63.4
32456	MIDLFORK	2	63.4
32486	HELLHOLE	1	0.5
32508	FRNCH MD	1	17
32490	GRNLEAF1	2	10
32490	GRNLEAF1	1	51.1
32451	FREC	1	47
	Total		**1200**

Placerville Sub-area

The most critical contingency is the loss of the Gold Hill-Clarksville 115 kV line followed by loss of the Gold Hill-Missouri Flat #2 115 kV line. The area limitation is thermal overloading of the Gold Hill-Missouri Flat #1 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 145 MW (includes 0 MW of QF and Muni generation as well as 118 MW of deficiency) in 2009 and 159 MW (includes 0 MW of QF and Muni generation as well as 132 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket.

Effectiveness factors:

All units within this area (El Dorado units 1&2 and Chili Bar) are needed therefore no effectiveness factor is required.

Placer Sub-area

The most critical contingency is the loss of the Drum-Higgins 115 kV line followed by loss of the Gold Hill-Placer #2 115 kV line. The area limitation is thermal overloading of the Gold Hill-Placer #1 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 146 MW (includes 0 MW of QF and Muni generation as well as 118 MW of deficiency) in 2009 and 157 MW (includes 0 MW of QF and Muni

generation as well as 129 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket.
The single most critical contingency is the loss of the Drum-Higgins 115 kV line with the Wise #1 unit out of service. The area limitation is thermal overloading of the Gold Hill-Placer #1 115 kV line. This limiting contingency establishes a Local Capacity Requirement of 64 MW (includes 0 MW of QF and Muni generation as well as 36 MW of deficiency) in 2009 and 86 MW (includes 0 MW of QF and Muni generation as well as 58 MW of deficiency) in 2011.

Effectiveness factors:

All units within this area (Wise units 1&2, Newcastle and Halsey) are needed therefore no effectiveness factor is required.

Drum-Rio Oso Sub-area

The most critical contingency is the loss of the Rio Oso #2 230/115 transformer followed by loss of the Rio Oso-Brighton 230 kV line. The area limitation is thermal overloading of the Rio Oso #1 230/115 kV transformer. This limiting contingency establishes a Local Capacity Requirement of 854 MW (includes 411 MW of QF and Muni generation as well as 200 MW of deficiency) in 2009 and 914 MW (includes 411 MW of QF and Muni generation as well as 260 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket.
The single most critical contingency is the loss of the Rio Oso #2 230/115 transformer. The area limitation is thermal overloading of the Rio Oso #1 230/115 kV transformer. This limiting contingency establishes a Local Capacity Requirement of 674 MW in 2009 and 680 MW in 2011 (includes 411 MW of QF and Muni generation).

Effectiveness factors:

All units within this area are needed for the most limiting contingency therefore no effectiveness factor is required. Effectiveness factors are given for the single most limiting contingency.

Gen No	Gen Name	ID	Qualifying Capacity	Eff Fctr (%)

32490	GRNLEAF1	2	10	22
32490	GRNLEAF1	1	51.1	22
32451	FREC	1	47	21
32156	WOODLAND	1	28.6	20
32502	DTCHFLT2	1	26	16
32476	ROLLINSF	1	11.7	15
32484	OXBOW F	1	6	15
32498	SPILINCF	1	18.3	15
32454	DRUM 5	1	49.5	15
32504	DRUM 1-2	1	13.2	15
32504	DRUM 1-2	2	13.2	15
32506	DRUM 3-4	1	13.2	15
32506	DRUM 3-4	2	13.2	15
32474	DEER CRK	1	3.1	15
32472	SPAULDG	1	7	15
32472	SPAULDG	2	4.2	15
32472	SPAULDG	3	1.7	15
32480	BOWMAN	1	2.5	14
32488	HAYPRES+	1	0	14
32488	HAYPRES+	2	1.9	14
32166	UC DAVIS	1	3.5	14
32464	DTCHFLT1	1	22	13
32494	YUBA CTY	1	41.3	12
32496	YCEC	1	50	12
32492	GRNLEAF2	1	49	12
32462	CHI.PARK	1	37.9	11
32500	ULTR RCK	1	22.1	7
31862	DEADWOOD	1	0	6
31814	FORBSTWN	1	30	6
31832	SLY.CR.	1	9.5	6
31794	WOODLEAF	1	55	6
32478	HALSEY F	1	8.6	4
32512	WISE	1	11.1	3
31888	OROVLLE	1	8.5	3
31890	PO POWER	2	7	3
31890	PO POWER	1	7	3
32460	NEWCSTLE	1	0	2
31834	KELLYRDG	1	10	2
32162	RIV.DLTA	1	0	2
	Total		**693.9**	

South of Rio Oso Sub-area

The most critical contingency is the loss of the Rio Oso-Gold Hill 230 line followed by loss of the Gold Hill-Ralston 230 kV line or vice versa. The area limitation is thermal

overloading of the Rio Oso-Atlantic 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 607 MW (includes 310 MW of QF and Muni generation as well as 220 MW of deficiency) in 2009 and 657 MW (includes 310 MW of QF and Muni generation as well as 270 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this pocket.

The single most critical contingency is the loss of the Rio Oso-Gold Hill 230 line with the Ralston unit out of service. The area limitation is thermal overloading of the Rio Oso-Atlantic 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 464 MW (includes 310 MW of QF and Muni generation as well as 95 MW of deficiency) in 2009 and 519 MW (includes 310 MW of QF and Muni generation as well as 132 MW of deficiency) in 2011.

Effectiveness factors:

All units within this area are needed for the most limiting contingency therefore no effectiveness factor is required.

Gen No	Gen Name	ID	Qualifying Capacity
32500	ULTR RCK	1	28.5
32456	MIDLFORK	1	63.4
32456	MIDLFORK	2	63.4
32458	RALSTON	1	86
32510	CHILIBAR	1	7
32514	ELDRADO2	1	10
32513	ELDRADO1	1	10
32486	HELLHOLE	1	0.5
32508	FRNCH MD	1	17
32460	NEWCSTLE	1	5.9
32478	HALSEY F	1	11
32512	WISE	1	10.8
32498	SPILINCF	1	13.7
32462	CHI.PARK	1	38
32464	DTCHFLT1	1	22
	Total		**387**

Sierra Overall Requirements:

	QF (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	267	805	776	1848

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[8]	1848	107	1955
Category C (Multiple)[9]	1848	465	2313

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[8]	1848	217	2065
Category C (Multiple)[9]	1848	622	2470

4. Stockton Area

Area Definition

The transmission facilities that establish the boundary of the Tesla-Bellota Sub-area are:

1) Bellota 230/115 kV Transformer #1
2) Bellota 230/115 kV Transformer #2
3) Tesla-Tracy 115 kV Line
4) Tesla-Salado 115 kV Line
5) Tesla-Salado-Manteca 115 kV line
6) Tesla-Shulte 115 kV Line
7) Tesla-Kasson-Manteca 115 kV Line

The substations that delineate the Tesla-Bellota Sub-area are:

1) Bellota 230 kV is out Bellota 115 kV is in
2) Bellota 230 kV is out Bellota 115 kV is in
3) Tesla is out Tracy is in
4) Tesla is out Salado is in
5) Tesla is out Salado and Manteca are in
6) Tesla is out Shulte is in
7) Tesla is out Kasson and Manteca are in

The transmission facilities that establish the boundary of the Lockeford Sub-area are:

1) Lockeford-Industrial 60 kV line
2) Lockeford-Lodi #1 60 kV line
3) Lockeford-Lodi #2 60 kV line
4) Lockeford-Lodi #3 60 kV line

The substations that delineate the Lockeford Sub-area are:

1) Lockeford is out Industrial is in

[8] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[9] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

2) Lockeford is out Lodi is in
3) Lockeford is out Lodi is in
4) Lockeford is out Lodi is in

The transmission facilities that establish the boundary of the Stagg Sub-area are:

1) Tesla – Stagg 230 kV Line
2) Tesla – Eight Mile Road 230 kV Line
3) Gold Hill – Eight Mile Road 230 kV Line
4) Gold Hill - Lodi Stigg 230 kV Line

The substations that delineate the Stagg Sub-area is:

1) Tesla is out Stagg is in
2) Tesla is out Eight Mile Road is in
3) Gold Hill is out Eight Mile Road is in
4) Gold Hill is out Lodi Stigg is in

Total 2009 busload within the defined area: 1320 MW with 28 MW of losses resulting in total load + losses of 1348 MW. Total 2011 busload within the defined area: 1366 MW with 31 MW of losses resulting in total load + losses of 1397 MW.

Total units and qualifying capacity available in this area:

Name	ID	Qualifying Capacity
GWFTRCY2	1	79.2
GWFTRCY1	1	79.8
FBERBORD	1	5.7
BELLTA T	1	0
CH.STN.	1	22.3
STNSLSRP	1	19.9
CPC STCN	1	62.9
CAMANCHE	1	3.7
CAMANCHE	2	3.7
CAMANCHE	3	3.7
DONNELLS	1	67.5
BEARDSLY	1	11
TULLOCH	1	9
TULLOCH	2	9
SANDBAR	1	16.8
SPRNG GP	1	6.7
STANISLS	1	91
LODI25CT	1	25.6
GEN.MILL	1	3.4
Stig CC	1	50
Total		**570.9**

Critical Contingency Analysis Summary

Stockton overall

The requirement for this area is driven by the sum of requirements for the Tesla-Bellota, Lockeford, and Stagg Sub-areas.

Tesla-Bellota Sub-area

The critical contingency for the Tesla-Bellota pocket is the loss of Tesla-Tracy 115 kV and Tesla-Kasson-Manteca 115 kV. The area limitation is thermal overloading of the Manteca-Ingram Creek section of Tesla-Salado-Manteca 115 kV line above its emergency rating. This limiting contingency establishes a Local Capacity Requirement of 567 MW (includes 235 MW of QF and Muni generation as well as 75 MW of deficiency) in 2009 and 642 MW (includes 235 MW of QF and Muni generation as well as 150 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this area.

The single most critical contingency for the Tesla-Bellota pocket is the loss of Tesla-Kasson-Manteca 115 kV line and the loss of the Stanislaus unit #1. The area limitation is thermal overloading of the Manteca-Ingram Creek section of Tesla-Salado-Manteca 115 kV line above its emergency rating. This single contingency establishes a Local Capacity Requirement of 500 MW (includes 235 MW of QF and Muni generation as well as 8 MW of deficiency) in 2009 and 530 MW (includes 235 MW of QF and Muni generation as well as 38 MW of deficiency) in 2011.

Effectiveness factors:

All units within this area are needed for the most limiting contingency therefore no effectiveness factor is required.

Name	ID	Qualifying Capacity
GWFTRCY2	1	79.2
GWFTRCY1	1	79.8
FBERBORD	1	5.7
BELLTA T	1	0
CH.STN.	1	22.3
STNSLSRP	1	19.9
CPC STCN	1	62.9

CAMANCHE	1	3.7
CAMANCHE	2	3.7
CAMANCHE	3	3.7
DONNELLS	1	67.5
BEARDSLY	1	11
TULLOCH	1	9
TULLOCH	2	9
SANDBAR	1	16.8
SPRNG GP	1	6.7
STANISLS	1	91
Total		**491.9**

Lockeford Sub-area

The critical contingency for the Lockeford area is the loss of Lockeford-Industrial 60 kV circuit and Lockeford-Lodi #2 60 kV circuit. The area limitation is thermal overloading of the Lockeford-Lodi Jct. section of the Lockeford-Lodi #3 60 kV circuit. This limiting contingency establishes a Local Capacity Requirement of 76 MW (including 29 MW of QF and Muni as well as a deficiency of 47 MW) in 2009 and 83 MW (including 29 MW of QF and Muni as well as a deficiency of 54 MW) in 2011 as the minimum capacity necessary for reliable load serving capability within this area.

The single most critical contingency for the Lockeford pocket is the loss of Lockeford-Lodi #2 60 kV line and the loss of the Lodi CT with possible overload of the Lockeford-Industrial 60 kV. This single contingency establishes a Local Capacity Requirement of 30 MW (includes 29 MW of QF and Muni generation as well as 1 MW of deficiency) in 2009 and 31 MW (includes 29 MW of QF and Muni generation as well as 2 MW of deficiency) in 2011.

Effectiveness factors:

All units within this area (Lodi CT and General Mill) are needed therefore no effectiveness factor is required.

Stagg Sub-area

The outage of the Tesla-Stagg 230 kV line and Tesla-Eight Mile 230 kV line causes low voltages at Stagg, Eight Mile Road and Lodi Stig 230 kV busses. Post-contingency steady-state voltages at these three busses are less than 0.90 pu. Lodi Stig generating

unit is needed to support voltage at these three 230 kV busses. This limiting contingency establishes a Local Capacity Requirement of 125 MW (includes 50 MW of Muni generation as well as 75 MW of deficiency) in 2009 and 175 MW (includes 50 MW of Muni generation as well as 125 MW of deficiency) in 2011 as the minimum capacity necessary for reliable load serving capability within this area.

Effectiveness factors:

The only unit within this area (Lodi Stig) is needed therefore no effectiveness factor is required.

Stockton Overall Requirements:

	QF (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	114	200	257	571

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[10]	521	9	530
Category C (Multiple)[11]	571	197	768

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[10]	521	40	561
Category C (Multiple)[11]	571	329	900

5. Greater Bay Area

Area Definition

The transmission tie lines into the Greater Bay Area are:

1) Lakeville-Sobrante 230 kV
2) Ignacio-Sobrante 230 kV
3) Parkway-Moraga 230 kV
4) Bahia-Moraga 230 kV
5) Lambie SW Sta-Vaca Dixon 230 kV
6) Peabody-Contra Costa P.P. 230 kV

[10] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

[11] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

7) Tesla-Kelso 230 kV
8) Tesla-Delta Switching Yard 230 kV
9) Tesla-Pittsburg #1 230 kV
10) Tesla-Pittsburg #2 230 kV
11) Tesla-Newark #1 230 kV
12) Tesla-Newark #2 230 kV
13) Tesla-Ravenswood 230 kV
14) Tesla-Metcalf 500 kV
15) Moss Landing-Metcalf 500 kV
16) Moss Landing-Metcalf #1 230 kV
17) Moss Landing-Metcalf #2 230 kV
18) Oakdale TID-Newark #1 115 kV
19) Oakdale TID-Newark #2 115 kV

The substations that delineate the Greater Bay Area are:

1) Lakeville is out Sobrante is in
2) Ignacio is out Sobrante is in
3) Parkway is out Moraga is in
4) Bahia is out Moraga is in
5) Lambie SW Sta is in Vaca Dixon is out
6) Peabody is out Contra Costa P.P. is in
7) Tesla is out Kelso is in
8) Tesla is out Delta Switching Yard is in
9) Tesla is out Pittsburg is in
10) Tesla is out Pittsburg is in
11) Tesla is out Newark is in
12) Tesla is out Newark is in
13) Tesla is out Ravenswood is in
14) Tesla is out Metcalf is in
15) Moss Landing is out Metcalf is in
16) Moss Landing is out Metcalf is in
17) Moss Landing is out Metcalf is in
18) Oakdale TID is out Newark is in
19) Oakdale TID is out Newark is in

Total 2009 busload within the defined area: 9658 MW with 220 MW of losses resulting in total load + losses of 9878 MW. Total 2011 busload within the defined area: 9865 MW with 262 MW of losses resulting in total load + losses of 10127 MW.

Total units and qualifying capacity available in this area:

No	Name	ID	Qualifying Capacity
38118	ALMDACT1	1	25.6
38119	ALMDACT2	1	25.6
33114	C.COS 4	1	0

33115	C.COS 5	1	0
33116	C.COS 6	1	345
33117	C.COS 7	1	345
33463	CARDINAL	2	10
33463	CARDINAL	1	17.8
35863	CATALYST	1	0
36856	CCA100	1	32
33136	CCCSD	1	4.4
32921	ChevGen1	1	54
32922	ChevGen2	1	54
36854	Cogen	2	3
36854	Cogen	1	3
32900	CRCKTCOG	1	243
32175	CREEDGT1	3	47
33145	CROWN.Z.	2	5.4
33145	CROWN.Z.	1	40
33108	DEC CTG1	1	173
33109	DEC CTG2	1	173
33110	DEC CTG3	1	173
33107	DEC STG1	1	294
33161	DOWCHEM1	1	16.8
33162	DOWCHEM2	1	22
33163	DOWCHEM3	1	22
36863	DVR A GT	1	47
36865	DVR A ST	1	50
36864	DVR B GT	1	50
35318	FLOWDPTR	1	5.7
33151	FOSTER W	3	35
33151	FOSTER W	1	45.4
33151	FOSTER W	2	45.4
36858	Gia100	1	21
36895	Gia200	1	21
35850	GLRY COG	2	40
35850	GLRY COG	1	80
32174	GOOSEHGT	2	46
35851	GROYPKR1	1	45
35852	GROYPKR2	1	45
35853	GROYPKR3	1	45
33131	GWF #1	1	20
33132	GWF #2	1	20
33133	GWF #3	1	20
33134	GWF #4	1	20
33135	GWF #5	1	20
32172	HIGHWNDS	1	13
32740	HILLSIDE	1	26.2
35637	IBM-CTLE	1	50
32173	LAMBGT1	1	47
35854	LECEFGT1	1	48

35855	LECEFGT2	1	48
35856	LECEFGT3	1	48
35857	LECEFGT4	1	48
35310	LFC FIN+	1	8.9
33112	LMECCT1	1	165
33111	LMECCT2	1	165
33113	LMECST1	1	230
35881	MEC CTG1	1	184
35882	MEC CTG2	1	186
35883	MEC STG1	1	227
33121	MRAGA 1T	1	0
33122	MRAGA 2T	1	0
33123	MRAGA 3T	1	0
32901	OAKLND 1	1	55
32902	OAKLND 2	1	55
32903	OAKLND 3	1	55
35860	OLS-AGNE	1	28.5
33252	POTRERO3	1	210
33253	POTRERO4	1	52
33254	POTRERO5	1	52
33255	POTRERO6	1	52
33105	PTSB 5	1	320
33106	PTSB 6	1	325
30000	PTSB 7	1	710
33178	RVEC_GEN	1	48
35312	SEAWESTF	1	3.3
33141	SHELL 1	1	20
33142	SHELL 2	1	40
33143	SHELL 3	1	40
32176	SHILOH	1	0
35861	SJ-SCL W	1	5
33462	SMATO1SC	1	0
33460	SMATO2SC	1	0
33461	SMATO3SC	1	0
32169	SOLANOWP	1	10
33468	SRI INTL	1	3.3
33139	STAUFER	1	2.3
32920	UNION CH	1	20.4
32910	UNOCAL	1	10
32910	UNOCAL	2	10
32910	UNOCAL	3	10
33466	UNTED CO	1	27.2
35320	USW FRIC	1	3.4
35320	USW FRIC	2	0
32168	USWINDPW	2	3.4
33838	USWP_#3	1	20.5
33170	WINDMSTR	1	3.6
35316	ZOND SYS	1	6.2

	Total 2007		**6545**
32168	ENXCO	2	50
	Total 2009		**6595**
35306	RCECSTG1	3	240
35305	RCECCTG2	2	180
35304	RCECCTG1	1	180
33118	COCO8_1	1	200
33119	COCO8_2	1	195
33120	COCO8_3	1	195
	Total 2011		**7785**

Critical Contingency Analysis Summary

San Francisco Sub-area

Per the CAISO Revised Action Plan for SF, all Potrero units (360 MW) will continued to be required until completion of the plan as it is presently described.

The most critical contingency is an outage of the TransBay cable either Martin-Bay Shore-Potrero 115 kV #1 or #2 cables. The sub-area area limitation is thermal overloading of the remaining Martin-Bay Shore-Potrero 115 kV #1 or #2 cables. This limiting contingency establishes a Local Capacity Requirement of 32 MW as the minimum capacity necessary for reliable load serving capability within this sub-area in 2009 and 2011.

Effectiveness factors:

All units within this sub-area are needed therefore no effectiveness factor is required.

Oakland Sub-area

For 2009 the most critical contingency is an outage of the D-L 115 kV cable (with one of the Oakland CT's off-line). The sub-area area limitation is thermal overloading of the C-X 115 kV cable. This limiting contingency establishes a Local Capacity Requirement of 105 MW (includes 50 MW of Muni generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

For 2011 with the addition of the new C-X 115kV cable, the most critical contingency is an combined outage of the D-L 115 kV cable and C-X 115 kV cable #3. The sub-area area limitation is thermal overloading of the remaining C-X #1 115 kV cable. This limiting contingency establishes a Local Capacity Requirement of 60 MW (includes 50 MW of Muni generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

All units within this sub-area have the same effectiveness factor. Units outside of this sub-area are not effective.

Llagas Sub-area

The most critical contingency is an outage between Metcalf D and Morgan Hill 115 kV (with one of the Gilroy Peaker off-line). The area limitation is thermal overloading of the Metcalf-Llagas 115 kV line. As documented within a CAISO Operating Procedure, this limitation is dependent on power flowing in the direction from Metcalf to Llagas/Morgan Hill. This limiting contingency establishes a Local Capacity Requirement of 115 and 120 MW in 2009 and 2011 respectively as the minimum capacity necessary for reliable load serving capability within this area.

Effectiveness factors:

All units within this area have the same effectiveness factor. Units outside of this area are not effective.

San Jose Sub-area

Due to existing SPS and future reconductoring this sub-area has no requirements.

Pittsburg Sub-area

The most critical contingency is an outage of the Pittsburg-Tesla #1 or #2 230 kV line (with Delta Energy Center off-line). The sub-area area limitation is thermal overloading of the parallel Pittsburg-Tesla 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 2278 MW in 2009 and 2528 MW in 2011 (including 678 MW of

QF generation) as the minimum capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units within the Bay Area that are at least 5% effective to the above-mentioned constraint.

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)
33840	FLOWD3-6	1	86
33840	FLOWD3-6	2	86
33840	FLOWD3-6	3	86
33840	FLOWD3-6	4	86
33171	TRSVQ+NW	2	26
33171	TRSVQ+NW	1	26
33105	PTSB 5	1	26
33106	PTSB 6	1	26
30000	PTSB 7	1	26
33110	DEC CTG3	1	25
33109	DEC CTG2	1	25
33108	DEC CTG1	1	25
33107	DEC STG1	1	25
33113	LMECST1	1	24
33112	LMECCT1	1	24
33111	LMECCT2	1	24
33132	GWF #2	1	24
33161	DOWCHEM1	1	24
33162	DOWCHEM2	1	24
33163	DOWCHEM3	1	24
33151	FOSTER W	1	23
33151	FOSTER W	2	23
33151	FOSTER W	3	23
33141	SHELL 1	1	21
33143	SHELL 3	1	21
33142	SHELL 2	1	21
32900	CRCKTCOG	1	19
32910	UNOCAL	1	19
32910	UNOCAL	2	19
32910	UNOCAL	3	19
32920	UNION CH	1	19
32922	ChevGen2	1	18
32921	ChevGen1	1	18
32740	HILLSIDE	1	18
33135	GWF #5	1	18
38119	ALMDACT2	1	16
32903	OAKLND 3	1	16

32902	OAKLND 2	1	16
32901	OAKLND 1	1	16
38118	ALMDACT1	1	16
30464	EXXON_BH	1	9
33252	POTRERO3	1	7
33253	POTRERO4	1	7
33254	POTRERO5	1	7
33255	POTRERO6	1	7
33466	UNTED CO	1	7
35312	SEAWESTF	1	7
35316	ZOND SYS	1	7
35320	USW FRIC	1	7
32176	SHILOH	1	5
36865	DVRPPSTA	1	5
36864	DVRPPCT2	1	5
36863	DVRPPCT1	1	5
33178	RVEC_GEN	1	5
32175	CREEDGT1	3	5
32174	GOOSEHGT	2	5
32173	LAMBGT1	1	5
32172	HIGHWNDS	1	5
33134	GWF #4	1	5
33116	C.COS 6	1	5
33117	C.COS 7	1	5
33133	GWF #3	1	5
33145	CROWN.Z.	1	5
33145	CROWN.Z.	2	5
33131	GWF #1	1	5
36856	CSC_CCA	1	5
33463	CARDINAL	1	5
33463	CARDINAL	2	5
32168	USWINDPW	1	5
32168	USWINDPW	2	5
33838	USWP_#3	1	5

Bay Area overall

The most critical contingency is the loss of the Tesla-Metcalf 500 kV followed by Delta Energy Center or vice versa. The area limitation is reactive margin. This limiting contingency establishes a Local Capacity Requirement of 4736 MW in 2009 and 4807 MW in 2011 (includes 1314 MW of Wind, QF and Muni generation) as the minimum capacity necessary for reliable load serving capability within this area (with both Contra Costa 4 & 5 on-line). Without these two units the Requirement would be about 4746 MW in 2009 and 4827 MW in 2011.

The second most critical contingency is the loss of the Tesla-Metcalf 500 kV followed by Tesla-Newark #1 230 kV or vice versa. The area limitation is thermal overloading of the Tesla #6 500/230 kV transformer. This limiting contingency establishes a Local Capacity Requirement of 4546 MW in 2009 and 4597 MW in 2011 (includes 1314 MW of Wind, QF and Muni generation). (This requirement only includes units in the Greater Bay Area, assuming all effective units in Stockton are at their historical output levels and not included in the requirement total.)

The third most critical contingency is the loss of the same Tesla-Metcalf 500 kV followed by Tesla-Newark #1 230 kV or vice versa. The area limitation is thermal overloading of the Tesla-Newark #2 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 3776 MW in 2009 and 4283 MW in 2011 (includes 1314 MW of Wind, QF and Muni generation).

Effectiveness factors:

For most helpful procurement information please read procedure T-133Z effectiveness factors – Bay Area at:

http://www.caiso.com/docs/2004/11/01/2004110116234011719.pdf

Bay Area Overall Requirements:

2009	Wind (MW)	QF/Selfgen (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	78	988	248	5281	6595

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[12]	4736	0	4736
Category C (Multiple)[13]	4736	0	4736

[12] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

[13] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

2011	Wind (MW)	QF/Selfgen (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	78	988	248	6471	7785

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[14]	4807	0	4807
Category C (Multiple)[15]	4807	0	4807

6. Greater Fresno Area

Area Definition

The transmission facilities coming into the Greater Fresno area are:

1) Gates-Henrietta Tap 1 230 kV
2) Gates-Henrietta Tap 2 230 kV
3) Gates #1 230/115 kV Transformer Bank
4) Los Banos #3 230/70 Transformer Bank
5) Los Banos #4 230/70 Transformer Bank
6) Panoche-Gates #1 230 kV
7) Panoche-Gates #2 230 kV
8) Panoche-Coburn 230 kV
9) Panoche-Moss Landing 230 kV
10) Panoche-Los Banos #1 230 kV
11) Panoche-Los Banos #2 230 kV
12) Panoche-Dos Amigos 230 kV
13) Warnerville-Wilson 230 kV
14) Wilson-Melones 230 kV
15) Midway-Semitropic-Smyrna 115kV
16) Coalinga #1-San Miguel 70 kV

The substations that delineate the Greater Fresno area are:

1) Gates is out Henrietta is in
2) Gates is out Henrietta is in
3) Gates 230 is out Gates 115 is in
4) Los Banos 230 is out Los Banos 70 is in
5) Los Banos 230 is out Los Banos 70 is in
6) Panoche is in Gates is out
7) Panoche is in Gates is out
8) Panoche is in Coburn is out

[14] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[15] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

9) Panoche is in Moss Landing is out
10) Panoche is in Los Banos is out
11) Panoche is in Los Banos is out
12) Panoche is in Dos Amigos is out
13) Warnerville is out Wilson is in
14) Wilson is in Melones is out
15) Midway and Semitropic are out Smyrna is in
16) Coalinga is in San Miguel is out

2009 total busload within the defined area: 3186 MW with 121 MW of losses resulting in total load + losses of 3296 MW.

2011 total busload within the defined area: 3284 MW with 123 MW of losses resulting in total load + losses of 3396 MW.

Total units and qualifying capacity available in this area:

No	Name	ID	Qualifying Capacity
34636	FRIANTDM	4	3.5
34636	FRIANTDM	3	8.7
34636	FRIANTDM	2	16.3
34608	AGRICO	2	7
34608	AGRICO	3	18.9
34608	AGRICO	4	26
34672	KRCDPCT2	1	56
34671	KRCDPCT1	1	56
34485	FRESNOWW	1	9
34142	WHD_PAN2	1	49
34553	WHD_GAT2	1	49
34179	MADERA_G	1	28.7
34433	GWF_HEP2	1	39.1
34431	GWF_HEP1	1	40
34541	GWF_GT2	1	45.1
34539	GWF_GT1	1	45.3
34186	DG_PAN1	1	49
34301	CHOWCOGN	1	52.5
34618	MCCALL1T	1	0
34621	MCCALL3T	1	0
34630	HERNDN1T	1	0
34632	HERNDN2T	1	0
38720	PINE FLT	1	75
38720	PINE FLT	2	75
38720	PINE FLT	3	75
34306	EXCHQUER	1	70.8
34658	WISHON	1	5
34658	WISHON	2	5
34658	WISHON	3	5

34658	WISHON	4	5
34344	KERCKHOF	1	8.5
34344	KERCKHOF	2	13
34344	KERCKHOF	3	12.8
34308	KERCKHOF	1	155
34600	HELMS 1	1	404
34602	HELMS 2	1	404
34604	HELMS 3	1	404
34610	HAAS	1	69.9
34610	HAAS	2	69.9
34624	BALCH 1	1	34
34612	BLCH 2-2	1	52.5
34614	BLCH 2-3	1	52.5
34616	KINGSRIV	1	52
34316	ONEILPMP	1	11
34320	MCSWAIN	1	3.9
34322	MERCEDFL	1	1.9
34658	WISHON	SJ	0.4
34631	SJ2GEN	1	3.2
34633	SJ3GEN	1	4.2
34332	JRWCOGEN	1	8.5
34334	BIO PWR	1	26.1
34640	ULTR.PWR	1	26.4
34642	KINGSBUR	1	35.3
34646	SANGERCO	1	42.9
34648	DINUBA E	1	13.5
34650	GWF-PWR.	1	25
34652	CHV.COAL	1	4.1
34652	CHV.COAL	2	14.8
34654	COLNGAGN	1	42.3
34342	INT.TURB	1	1.1
	Total		**2912**

Critical Contingency Analysis Summary

Wilson Sub-area

The most critical contingency for the Wilson sub-area is the loss of the Wilson - Melones 230 kV line with one of the Helm units out of service, which would thermally overload the Wilson - Warnerville 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 1451 MW (which includes 104 MW of Muni generation and 215 MW of QF generation) in 2009 and 1508 MW (which includes 104 MW of Muni generation and 215 MW of QF generation) in 2011 as the generation capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units within Fresno that are at least 5% effective to the above-mentioned constraint.

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)
34332	JRWCOGEN	1	40
34322	MERCEDFL	1	33
34320	MCSWAIN	1	32
34306	EXCHQUER	1	31
34600	HELMS 1	1	31
34602	HELMS 2	1	31
34604	HELMS 3	1	31
34301	CHOWCOGN	1	29
34636	FRIANTDM	1	25
34485	FRESNOWW	1	24
34658	WISHON	1	24
34658	WISHON	2	24
34658	WISHON	3	24
34658	WISHON	4	24
34631	SJ2GEN	1	24
34633	SJ3GEN	1	23
34344	KERCKHOF	1	22
34344	KERCKHOF	2	22
34344	KERCKHOF	3	22
34308	KERCKHOF	1	22
34179	MADERA_G	1	20
34648	DINUBA E	1	19
34672	KRCDPCT2	1	18
34671	KRCDPCT1	1	18
34624	BALCH 1	1	18
34640	ULTR.PWR	1	18
34646	SANGERCO	1	18
38720	PINE FLT	1	17
38720	PINE FLT	2	17
38720	PINE FLT	3	17
34616	KINGSRIV	1	17
34642	KINGSBUR	1	17
34433	GWF_HEP2	1	14
34431	GWF_HEP1	1	14
34610	HAAS	1	14
34610	HAAS	2	14
34612	BLCH 2-2	1	14
34614	BLCH 2-3	1	14
34539	GWF_GT1	1	13
34334	BIO PWR	1	13
34541	GWF_GT2	1	12
34650	GWF-PWR.	1	12
34142	WHD_PAN2	1	11
34186	DG_PAN1	1	11

34608	AGRICO	2	10
34608	AGRICO	3	10
34608	AGRICO	4	10
34553	WHD_GAT2	1	8
34652	CHV.COAL	1	8
34652	CHV.COAL	2	8
34654	COLNGAGN	1	8
34342	INT.TURB	1	6
34316	ONEILPMP	1	6

Herndon Sub-area

The most critical contingency for the Herndon sub-area is the loss of the Herndon 230/115 kV bank 1, which would thermally overload the parallel Herndon 230/115 kV bank 2. This limiting contingency establishes a Local Capacity Requirement of 720 MW (which includes 149 MW of QF generation) in 2009 and 732 MW (which includes 149 MW of QF generation) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The following table has units within Fresno area that are relative effective to the above-mentioned constraint. All units in Fresno not listed or units outside of this area have smaller effectiveness factors.

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)
34308	KERCKHOF	1	36
34344	KERCKHOF	1	35
34344	KERCKHOF	2	35
34344	KERCKHOF	3	35
34624	BALCH 1	1	33
34646	SANGERCO	1	32
34672	KRCDPCT2	1	31
34671	KRCDPCT1	1	31
34616	KINGSRIV	1	31
34640	ULTR.PWR	1	31
34648	DINUBA E	1	29
34642	KINGSBUR	1	26
38720	PINE FLT	1	22
38720	PINE FLT	2	22
38720	PINE FLT	3	22
34612	BLCH 2-2	1	22
34610	HAAS	1	21
34610	HAAS	2	21
34614	BLCH 2-3	1	21

34433	GWF_HEP2	1	14
34431	GWF_HEP1	1	14
34301	CHOWCOGN	1	9
34608	AGRICO	2	7
34608	AGRICO	3	7
34608	AGRICO	4	7
34334	BIO PWR	1	3
34652	CHV.COAL	1	3
34652	CHV.COAL	2	3
34553	WHD_GAT2	1	2
34179	MADERA_G	1	2
34654	COLNGAGN	1	2
34332	JRWCOGEN	1	-5
34485	FRESNOWW	1	-13
34600	HELMS 1	1	-15
34602	HELMS 2	1	-15
34604	HELMS 3	1	-15

McCall Sub-area

No requirements.

McCall 230/115kV TB#1 is to be replaced May 2008. Therefore the 2009 and 2011 LCR requirements for the McCall sub-area have been eliminated.

Henrietta Sub-area

The most critical contingency for the Henrietta sub-area is the loss of new Henrietta 230/70 kV transformer bank with Henrietta-GWF Henrietta 70 kV line out of service, which would thermally overload the old Henrietta 230/70 kV transformer bank. This combined limit establishes a Local Capacity Requirement of 119 MW (which includes 25 MW of QF generation and 4 MW of deficiency) in 2009 and 122 MW (which includes 25 MW of QF generation and 7 MW of deficiency) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

The most critical single contingency for the Henrietta sub-area is the loss of new Henrietta 230/70 kV transformer bank, which would thermally overload the old Henrietta 230/70 kV transformer bank. This combined limit establishes a Local Capacity Requirement of 36 MW (which includes 25 MW of QF generation) in 2009 and 40 MW (which includes 25 MW of QF generation) in 2011.

Effectiveness factors:

All units within this sub-area have the same effectiveness factor. Units outside of this sub-area are not effective.

Merced Sub-area

The most critical contingencies for the Merced sub-area is the double line outage of the Wilson – Atwater 115 kV #1 and #2 lines, which would thermally overload the Wilson – Merced 115 kV #1 and #2 lines. This limiting contingency establishes a Local Capacity Requirement of 96 MW (which includes 8.5 MW of QF generation and 88 MW of area deficiency) in 2009 and 111 MW (which includes 8.5 MW of QF generation and 102 MW of area deficiency) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

The only unit in this sub-area JRWCOGEN is needed therefore no effectiveness factor is required.

Additional helpful effectiveness factors for Fresno area:

Please read procedure T-129Z effectiveness factors - Fresno Area at:
http://www.caiso.com/docs/2005/07/13/2005071314483315210.pdf

Fresno Area Overall Requirements:

	QF/Selfgen (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	275	300	2337	2912

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single) [16]	2172	0	2172
Category C (Multiple) [17]	2172	92	2264

[16] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[17] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single) [18]	2187	0	2187
Category C (Multiple) [19]	2187	109	2296

7. Kern Area

Area Definition

The transmission facilities coming into the Kern PP sub-area are:

1) Wheeler Ridge-Lamont 115 kV line
2) Kern PP 230/115 kV Bank # 3 & 3A
3) Kern PP 230/115 kV Bank # 4
4) Kern PP 230/115 kV Bank # 5
5) Midway 230/115 Bank # 1
6) Midway 230/115 Bank # 2 & 2a
7) Midway 230/115 Bank #3
8) Temblor – San Luis Obispo 115 kV line

The substations that delineate the Kern-PP sub-area are:

1) Wheeler Ridge is out Lamont is in
2) Kern PP 230 is out Kern PP 115 kV is in
3) Kern PP 230 is out Kern PP 115 kV is in
4) Kern PP 230 is out Kern PP 115 kV is in
5) Midway 230 is out Midway 115 is in
6) Midway 230 is out Midway 115 is in
7) Midway 230 is out Midway 115 is in
8) Temblor is in San Luis Obispo is out

The transmission facilities coming into the Weedpatch sub-area are:

1) Wheeler Ridge-Tejon 60 kV line
2) Wheeler Ridge-Weedpach 60 kV line
3) Wheeler Ridge-San Bernard 60 kV line

The substations that delineate the Weedpatch sub-area are:

1) Wheeler Ridge is out Tejon is in
2) Wheeler Ridge is out Weedpach is in
3) Wheeler Ridge is out San Bernard is in

[18] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

[19] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

2009 total busload within the defined area: 1203 MW with 14 MW of losses resulting in total load + losses of 1217 MW.
2011 total busload within the defined area: 1233 MW with 16 MW of losses resulting in total load + losses of 1249 MW.

Total units and qualifying capacity available in this Kern PP sub-area:

No	Name	ID	Qualifying Capacity
35056	TX-LOSTH	1	9
35034	MIDSUN +	1	20
35037	UNIVRSTY	1	39.9
35038	CHLKCLF+	1	49.9
35006	KERN 1	1	0
35008	KERN 2	1	0
35024	DEXEL +	1	32.1
35026	KERNFRNT	1	52.7
35029	BADGERCK	1	48.9
35027	HISIERRA	1	52.7
35023	DOUBLE C	1	51.9
35028	OILDALE	1	40.1
35032	CHV-CYMR	1	22.7
34783	TEXCO_NM	1	12
34783	TEXCO_NM	2	9
35036	MT POSO	1	56.1
35035	ULTR PWR	1	36.4
35040	KERNRDGE	1	66
35040	KERNRDGE	2	14.2
35044	TX MIDST	1	39.8
35046	SEKR	1	34.2
35048	FRITOLAY	1	7.1
35050	SLR-TANN	1	17.4
35052	CHEV.USA	1	14.4
35058	PSE-LVOK	1	49
35060	PSEMCKIT	1	50.8
35062	DISCOVRY	1	44
35064	NAVY 35R	1	31.9
35064	NAVY 35R	2	32.5
35066	PSE-BEAR	1	51.3
	Total		**986**

Total units and qualifying capacity available in this Kern PP sub-area:

No	Name	ID	Qualifying Capacity
35018	KERNCNYN	1	11.2
35020	RIOBRAVO	1	12.1
	Total		**23.3**

Critical Contingency Analysis Summary

Kern PP Sub-area

The most critical contingency for the Kern PP sub-area is the outage of the Kern PP #5 230/115 kV transformer bank and the Kern PP – Kern Front 115 kV line, which would thermally overload the parallel Kern PP 230/115 kV Bank 3 and Bank 3a. This limiting contingency establishes a Local Capacity Requirement of 515 MW (which includes 966 MW of QF generation) in 2009 and 549 MW (which includes 966 MW QF generation) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

The most critical single contingency for the Kern PP sub-area is the loss of Kern PP #5 230/115 kV transformer bank, which would thermally overload the parallel Kern PP 230/115 kV Bank 3 and Bank 3a. This limiting contingency establishes a Local Capacity Requirement of 332 MW (which includes 966 MW of QF generation) in 2009 and 364 MW (which includes 966 MW of QF generation) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

All units within this sub-area are under long-term contracts. No additional procurement needs to be done; therefore no effectiveness factor is required.

Wheedpatch Sub-area

The most critical contingency is the loss of the Wheeler Ridge – San Bernard 70 kV line and the Wheeler Ridge – Tejon 70 kV line, which would thermally overload the Wheeler Ridge – Weedparch 70 kV line and cause low voltage problem at the local 70 kV transmission system. This limiting contingency establishes a Local Capacity Requirement of 39 MW (which includes 8 MW of QF generation and 19 MW of area deficiency) in 2009 and 40 MW (which includes 8 MW of QF generation and 20 MW of area deficiency) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this sub-area.

Effectiveness factors:

All units within this sub-area are needed therefore no effectiveness factor is required.

Kern Area Overall Requirements:

	QF/Selfgen (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	978	31	1009

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single) [20]	332	0	332
Category C (Multiple) [21]	545	19	564

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single) [20]	364	0	364
Category C (Multiple) [21]	580	20	600

8. LA Basin Area

Area Definition

The transmission tie lines into the LA Basin Area are:

1) San Onofre - San Luis Rey #1, #2, & #3 230 kV Lines
2) San Onofre - Talega #1 & #2 230 kV Lines
3) Lugo - Mira Loma #2 & #3 500 kV Lines
4) Lugo – Rancho Vista #1 500 kV Line
5) Sylmar - Eagle Rock 230 kV Line
6) Sylmar - Gould 230 kV Line
7) Vincent - Mesa Cal #1 230 kV Line
8) Antelope - Mesa Cal #1 230 kV Line
9) Vincent - Rio Hondo #1 & #2 230 kV Lines
10) Eagle Rock - Pardee #1 230 kV Line
11) Devers - Palo Verde 500 kV Line
12) Devers - Harquahala 500 kV Line
13) Devers - Coachelv # 1 230 kV Line

[20] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[21] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

14) Mirage - Ramon # 1 230 kV Line
15) Mirage - Julian Hinds 230 kV Line

The substations that delineate the LA Basin Area are:

1) San Onofre is in San Luis Rey is out
2) San Onofre is in Talega is out
3) Mira Loma is in Lugo is out
4) Rancho Vista is in Lugo is out
5) Eagle Rock is in Sylmar is out
6) Gould is in Sylmar is out
7) Mesa Cal is in Vincent is out
8) Mesa Cal is in Antelope is out
9) Rio Hondo is in Vincent is out
10) Eagle Rock is in Pardee is out
11) Devers is in Palo Verde is out
12) Devers is in Harquahala is out
13) Devers is in Coachelv is out
14) Mirage is in Ramon is out
15) Mirage is in Julian Hinds is out

Total 2009 busload within the defined area is 18,864 MW with 393 MW of losses and 120 pumps resulting in total load + losses + pumps of 19,377 MW. Total 2011 busload within the defined area is 19,561 MW with 455 MW of losses and 120 MW of pumps resulting in total load + losses + pumps of 20,236 MW.

Total units and qualifying capacity available in the Eastern sub-area:

BUS-NO	NAME1	ID	Qualifying Capacity	Subarea
24052	MTNVIST3	3	319	Eastern LA Basin
24053	MTNVIST4	4	320	Eastern LA Basin
28190	WINTECX2	1	44	Eastern LA Basin
28191	WINTECX1	1	42	Eastern LA Basin
28180	WINTEC8	1	42	Eastern LA Basin
24921	MNTV-CT1	1	143.5	Eastern LA Basin
24922	MNTV-CT2	1	143.5	Eastern LA Basin
24923	MNTV-ST1	1	249	Eastern LA Basin
24924	MNTV-CT3	1	143.5	Eastern LA Basin
24925	MNTV-CT4	1	143.5	Eastern LA Basin
24926	MNTV-ST2	1	249	Eastern LA Basin
25632	TERAWND	1	1	Eastern LA Basin
25633	CAPWIND	1	1	Eastern LA Basin
25634	BUCKWND	1	1	Eastern LA Basin
25635	ALTWIND	1	2.9	Eastern LA Basin
25636	RENWIND	1	1	Eastern LA Basin

25637	TRANWND	1	2.9	Eastern LA Basin
25639	SEAWIND	1	3	Eastern LA Basin
25640	PANAERO	1	1.9	Eastern LA Basin
25645	VENWIND	1	1.9	Eastern LA Basin
25646	SANWIND	1	1	Eastern LA Basin
24826	INDIGO	1	17	Eastern LA Basin
24815	GARNET	1	1	Eastern LA Basin
28020	WINTEC6	1	1.9	Eastern LA Basin
28060	SEAWEST	1	1.9	Eastern LA Basin
28060	SEAWEST	2	1.9	Eastern LA Basin
28280	CABAZON	1	1.9	Eastern LA Basin
24030	DELGEN	1	33.1	Eastern LA Basin
24071	INLAND	1	19.7	Eastern LA Basin
24140	SIMPSON	1	34	Eastern LA Basin
24902	VSTA	1	0	Eastern LA Basin
24229	VALLEY-S	1	0	Eastern LA Basin
25991	VALYSVC2	1	0	Eastern LA Basin
25990	VALYSVC1	1	0	Eastern LA Basin
24902	VSTA	2	1.3	Eastern LA Basin
24214	SANBRDNO	2	0.5	Eastern LA Basin
24214	SANBRDNO	1	0.1	Eastern LA Basin
24055	ETIWANDA	2	34.7	Eastern LA Basin
24055	ETIWANDA	1	0.6	Eastern LA Basin
25422	ETI MWDG	1	23.7	Eastern LA Basin
28061	WHITEWTR	1	52.8	Eastern LA Basin
28260	ALTAMSA4	1	32	Eastern LA Basin
24160	VALLEYSC	1	4.2	Eastern LA Basin
24111	PADUA	2	5.8	Eastern LA Basin
24111	PADUA	1	0.5	Eastern LA Basin
24024	CHINO	1	9.9	Eastern LA Basin
25648	DVLCYN1G	1	50.7	Eastern LA Basin
25649	DVLCYN2G	2	50.7	Eastern LA Basin
25603	DVLCYN3G	1	67.7	Eastern LA Basin
25604	DVLCYN4G	2	67.7	Eastern LA Basin
	Total 2007		**2371.9**	
28041	TOTO37C1	1	405	Eastern LA Basin
28042	TOTO37C2	1	405	Eastern LA Basin
24242	RERC1G	1	48	Eastern LA Basin
24243	RERC1G	1	48	Eastern LA Basin
24244	SPRINGEN	1	44	Eastern LA Basin
	Total 2009 and 2011		**3322**	

Total units and qualifying capacity available in the Western sub-area:

BUS-NO	NAME1	ID	Qualifying Capacity	Subarea
24001	ALAMT1 G	1	174.6	Western LA Basin
24002	ALAMT2 G	2	175	Western LA Basin

24003	ALAMT3 G	3	332.2	Western LA Basin
24004	ALAMT4 G	4	335.7	Western LA Basin
24005	ALAMT5 G	5	485	Western LA Basin
24161	ALAMT6 G	6	495	Western LA Basin
24162	ALAMT7 G	7	0	Western LA Basin
25203	ANAHEIMG	1	46.6	Western LA Basin
24018	BRIGEN	1	35	Western LA Basin
24020	CARBOGEN	1	29	Western LA Basin
24047	ELSEG3 G	3	335	Western LA Basin
24048	ELSEG4 G	4	335	Western LA Basin
24066	HUNT1 G	1	225.8	Western LA Basin
24067	HUNT2 G	2	225.8	Western LA Basin
24167	HUNT3 G	3	225	Western LA Basin
24168	HUNT4 G	4	227.4	Western LA Basin
24120	PULPGEN	1	40	Western LA Basin
24121	REDON5 G	5	178.9	Western LA Basin
24122	REDON6 G	6	175	Western LA Basin
24123	REDON7 G	7	493.2	Western LA Basin
24124	REDON8 G	8	486.9	Western LA Basin
24133	SANTIAGO	1	17	Western LA Basin
24062	HARBOR G	0	88.6	Western LA Basin
25510	HARBORG4	LP	5.7	Western LA Basin
24062	HARBOR G	HP	5.7	Western LA Basin
24011	ARCO 1G	1	64.7	Western LA Basin
24012	ARCO 2G	2	64.7	Western LA Basin
24013	ARCO 3G	3	64.7	Western LA Basin
24014	ARCO 4G	4	64.7	Western LA Basin
24163	ARCO 5G	5	31.2	Western LA Basin
24164	ARCO 6G	6	31.2	Western LA Basin
24022	CHEVGEN1	1	0.8	Western LA Basin
24023	CHEVGEN2	2	0.8	Western LA Basin
24026	CIMGEN	1	26.1	Western LA Basin
24063	HILLGEN	1	37.3	Western LA Basin
24070	ICEGEN	1	46.2	Western LA Basin
24139	SERRFGEN	1	25.2	Western LA Basin
24203	CENTER S	1	25.2	Western LA Basin
24075	LAGUBELL	1	11.2	Western LA Basin
24073	LA FRESA	1	5.7	Western LA Basin
24094	MOBGEN	1	45	Western LA Basin
24064	HINSON	1	25.2	Western LA Basin
24027	COLDGEN	1	28	Western LA Basin
24060	GROWGEN	1	28	Western LA Basin
24169	HUNT5 G	5	0	Western LA Basin
24213	RIOHONDO	1	0.9	Western LA Basin
24209	MESA CAL	1	0.6	Western LA Basin
24208	LCIENEGA	1	2.3	Western LA Basin
24083	LITEHIPE	1	0.3	Western LA Basin

24028	DELAMO	1	0	Western LA Basin
24157	WALNUT	1	7.9	Western LA Basin
28005	PASADNA1	1	22.5	Western LA Basin
28006	PASADNA2	1	22.5	Western LA Basin
28007	BRODWYSC	1	65	Western LA Basin
24211	OLINDA	1	2.3	Western LA Basin
24197	ELLIS	1	7.1	Western LA Basin
24129	S.ONOFR2	2	1115	Western LA Basin
24130	S.ONOFR3	3	1105	Western LA Basin
	Total 2007		**8150.4**	Western LA Basin
24239	MALBRG1G	C1	42	Western LA Basin
24240	MALBRG2G	C2	42	Western LA Basin
24241	MALBRG3G	S3	50	Western LA Basin
	Total 2009 and 2011		**8284.4**	

Critical Contingency Analysis Summary

LA Basin overall:

The most critical contingency for LA Basin is the loss of Harquahala-Devers 500 kV line with one of the Songs units out of service. The area limitation is the new South of Lugo path rating estimated at 6,400 MW. This limiting contingency establishes a Local Capacity Requirement of 8,765 MW in 2009 and 9,525 MW in 2011 (includes 3,784 MW of QF, nuclear and Muni generation) as the minimum generation capacity necessary for reliable load serving capability within this area.

West of Devers Sub-area:

The most critical contingency for West of Devers sub-area within the LA Basin is the loss of the Devers-Valley #1 500 kV followed by Devers-Valley #2 500 kV line, which would thermally overload the Devers-San Bernardino #1 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 1020 MW in 2009 and 2011 (includes 0 MW of QF, Muni and nuclear units). SCE is planning a SPS to mitigate the Devers-San Bernardino # 1 230 kV line overload for loss of two Devers-Valley 500 kV lines. Since the details of this SPS are not available at this time, this SPS was not modeled for this LCR study. It should be noted that the LCR requirement for this contingency might drop if the SPS is modeled.

Effectiveness factors:

All units within this area (both Mountain View power blocks – CT 1, 2, 3, 4 as well as ST 1 and 2) are needed therefore no effectiveness factor is required.

Barre Sub-area:

The most critical contingency for Barre sub-area within LA Basin is the loss of the Barre–Villa Park 230 kV line with Alamitos 6 unit out of service, which would thermally overload the Barre-Lewis 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 2,965 MW in 2009 and 2011 (includes 671 MW of QF, Muni and nuclear units).

Effectiveness factors:

The following table has units within the LA Basin that are effective to the above-mentioned constraint.

Gen Bus	Gen Name	Gen ID	Eff Fctr (%)
24001	ALAMT1 G	1	30
24002	ALAMT2 G	2	30
24003	ALAMT3 G	3	30
24004	ALAMT4 G	4	30
24005	ALAMT5 G	5	30
24161	ALAMT6 G	6	30
24066	HUNT1 G	1	28
24067	HUNT2 G	2	28
24167	HUNT3 G	3	28
24168	HUNT4 G	4	28
24070	ICEGEN	1	19
24011	ARCO 1G	1	18
24012	ARCO 2G	2	18
24013	ARCO 3G	3	18
24014	ARCO 4G	4	18
24163	ARCO 5G	5	18
24164	ARCO 6G	6	18
24018	BRIGEN	1	18
24020	CARBOGEN	1	18
24064	HINSON	1	18
24139	SERRFGEN	1	18
24062	HARBOR G	1	18
24022	CHEVGEN1	1	16
24023	CHEVGEN2	2	16
24047	ELSEG3 G	3	16

24048	ELSEG4 G	4	16
24094	MOBGEN	1	16
24121	REDON5 G	5	16
24122	REDON6 G	6	16
24123	REDON7 G	7	16
24124	REDON8 G	8	16
24027	COLDGEN	1	14
24060	GROWGEN	1	14
24120	PULPGEN	1	14
24241	MALBRG3G	S3	14
24240	MALBRG2G	C2	14
24239	MALBRG1G	C1	14
28007	BRODWYSC	1	11
28005	PASADNA1	1	10
28006	PASADNA2	1	10
24063	HILLGEN	1	5

LA Basin Overall Requirements:

2009 and 2011	QF/Wind (MW)	Muni (MW)	Nuclear (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	829	735	2220	7822	11606

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[22]	8765	0	8765
Category C (Multiple)[23]	8765	0	8765

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[22]	9525	0	9525
Category C (Multiple)[23]	9525	0	9525

LA Basin & North of Lugo combined:

There is an additional most critical contingency that needs to be satisfied with the LA Basin units as well as the North of Lugo units. This is the loss of the Paloverde-Devers 500 kV line followed by Harquahala-Devers 500 kV line, which would thermally overload the Victorville-Lugo 500 kV line. This limiting contingency establishes a Local Capacity Requirement of 11,727 MW in the LA Basin & North of Lugo (includes 4,648 MW of QF,

[22] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[23] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

nuclear and Muni generation) in 2009 and 12,542 MW combined in the LA Basin & North of Lugo (includes 4,648 MW of QF, nuclear and Muni generation) in 2011 as the minimum generation capacity necessary for reliable load serving capability within this combined area. SCE is planning a SPS that will drop load for loss of Paloverde-Devers and Harquahala-Devers 500 kV lines. The details of this SPS had not been finalized by the time this study was conducted. Therefore, these study results do not capture this SPS. It should be noted that the LCR requirement for this contingency might drop if the SPS is modeled.

There is an additional most critical single contingency that needs to be satisfied with the LA Basin units as well as the North of Lugo units. This is the loss of the Eldorado-Lugo 500 kV line followed by one Songs generator, which would thermally overload the Victorville-Lugo 500 kV line. This limiting contingency establishes a Local Capacity Requirement of 11,278 MW in the LA Basin & North of Lugo (includes 4,648 MW of QF, nuclear and Muni generation) in 2009 and 11,587 MW combined in the LA Basin & North of Lugo (includes 4,648 MW of QF, nuclear and Muni generation) in 2011.

Total units and qualifying capacity available in the North of Lugo sub-area:

BUS-NO	NAME	ID	Qualifying Capacity	Subarea
28000	HIDEDST1	1	300	North of Lugo
28001	HIDEDCT3	1	170	North of Lugo
28002	HIDEDCT2	1	170	North of Lugo
28003	HIDEDCT1	1	170	North of Lugo
24718	ALTA31GT	31	65	North of Lugo
24734	ALTA32GT	32	65	North of Lugo
24719	ALTA 3ST	3	105	North of Lugo
24720	ALTA41GT	41	65	North of Lugo
24735	ALTA42GT	42	65	North of Lugo
24721	ALTA 4ST	4	105	North of Lugo
24714	ALTA 1G	1	63	North of Lugo
24715	ALTA 2G	2	81.5	North of Lugo
24709	BSPHYD26	26	9.1	North of Lugo
24710	BSPHYD34	34	12.12	North of Lugo
24784	POOLUWD	1	7.21	North of Lugo
24783	RUSH	1	11.5	North of Lugo
24703	BLM E7G	7	20	North of Lugo
24704	BLM E8G	8	20	North of Lugo
24705	BLM W9G	9	20	North of Lugo

24708	BORAX I	1	47	North of Lugo
24711	CALGEN1G	1	30	North of Lugo
24712	CALGEN2G	2	25	North of Lugo
24713	CALGEN3G	3	25	North of Lugo
24726	CSA DIAB	1	0	North of Lugo
24732	KERRGEN	1	22.67	North of Lugo
24733	KERRMGEE	1	16.86	North of Lugo
24737	LUZ8 G	8	80	North of Lugo
24738	LUZ9 G	9	80	North of Lugo
24740	MC GEN	1	99.58	North of Lugo
24742	MOGEN G	1	58	North of Lugo
24744	NAVYII4G	4	27.8	North of Lugo
24745	NAVYII5G	5	27.8	North of Lugo
24746	NAVYII6G	6	27.8	North of Lugo
24747	OXBOW G1	1	50	North of Lugo
24751	SEGS 1G	1	6.84	North of Lugo
24752	SEGS 2G	2	30	North of Lugo
24754	SUNGEN3G	3	34	North of Lugo
24755	SUNGEN4G	4	34	North of Lugo
24756	SUNGEN5G	5	34	North of Lugo
24757	SUNGEN6G	6	35	North of Lugo
24758	SUNGEN7G	7	35	North of Lugo
	Total 2009 and 2011		**2350.78**	

LA Basin & North of Lugo Overall Requirements:

2009 and 2011 available generation	QF/Wind (MW)	Muni (MW)	Nuclear (MW)	Market (MW)	Max. Qualifying Capacity (MW)
LA Basin	829	735	2220	7822	11606
North of Lugo	864	0	0	1487	2351
Total LA Basin & North of Lugo	1693	735	2220	9309	13957

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[24]	11278	0	11278
Category C (Multiple)[25]	11727	0	11727

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[24]	12410	0	12410
Category C (Multiple)[25]	12542	0	12542

[24] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[25] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

9. Big Creek/Ventura Area

Area Definition

The transmission tie lines into the Big Creek/Ventura Area are:

1) Vincent-Antelope 230 kV Line
2) Mesa-Antelope 230 kV Line
3) Sylmar-Pardee #1 230 kV Line
4) Sylmar-Pardee #2 230 kV Line
5) Eagle Rock-Pardee #1 230 kV Line
6) Vincent-Pardee 230 kV Line
7) Vincent-Santa Clara 230 kV Line

The substations that delineate the Big Creek/Ventura Area are:

1) Vincent is out Antelope is in
2) Mesa is out Antelope is in
3) Sylmar is out Pardee is in
4) Sylmar is out Pardee is in
5) Eagle Rock is out Pardee is in
6) Vincent is out Pardee is in
7) Vincent is out Santa Clara is in

Total 2009 busload within the defined area is 4,525 MW with 138 MW of losses and 320 MW of pumps resulting in total load + losses + pumps of 4,983 MW. Total 2011 busload within the defined area is 4,784 MW with 141 MW of losses and 320 MW of pumps resulting in total load + losses of 5,245 MW.

Total units and qualifying capacity available in the Big Creek/Ventura area:

BUS-NO	NAME	ID	Qualifying Capacity
28055	PSTRIAS2	S2	85
28054	PSTRIAG3	G3	165
28053	PSTRIAS1	S1	170
28052	PSTRIAG2	G2	165
28051	PSTRIAG1	G1	165
24009	APPGEN1G	1	45
24010	APPGEN2G	2	45
24012	APPGENST	?	24
24089	MANDLY1G	1	215
24090	MANDLY2G	2	215
24222	MANDLY3G	3	130
24102	OMAR 1G	1	75
24103	OMAR 2G	2	75
24104	OMAR 3G	3	75
24105	OMAR 4G	4	75
24107	ORMOND1G	1	741.27

24108	ORMOND2G	2	775
24110	OXGEN	1	48.1
24113	PANDOL	1	27
24113	PANDOL	2	22
28008	LAKEGEN	1	11
24118	PITCHGEN	1	21.51
24119	PROCGEN	1	44.18
24143	SYCCYN1G	1	76.35
24144	SYCCYN2G	2	76.35
24145	SYCCYN3G	3	76.35
24146	SYCCYN4G	4	76.35
24148	TENNGEN1	1	19.81
24149	TENNGEN2	2	16.92
24150	ULTRAGEN	1	41
24159	WILLAMET	1	14.12
24152	VESTAL	1	6.49
25651	WARNE1	1	39
25652	WARNE2	1	39
25653	ALAMO SC	1	18
24127	S.CLARA	1	3.7
28004	ELLWOOD	1	54
24319	EASTWOOD	1	203.76
24306	B CRK1-1	1	20.67
24306	B CRK1-1	2	16.73
24307	B CRK1-2	3	20.67
24307	B CRK1-2	4	30.71
24308	B CRK2-1	1	48.53
24308	B CRK2-1	2	48.43
24309	B CRK2-2	3	19.69
24309	B CRK2-2	4	19.69
24310	B CRK2-3	5	16.64
24310	B CRK2-3	6	18.51
24311	B CRK3-1	1	33.96
24311	B CRK3-1	2	33.96
24312	B CRK3-2	3	33.76
24312	B CRK3-2	4	39.87
24313	B CRK3-3	5	37.50
24314	B CRK 4	41	49.32
24314	B CRK 4	42	49.32
24315	B CRK 8	81	25.40
24315	B CRK 8	82	38.09
24317	MAMOTH1G	1	92.04
24318	MAMOTH2G	2	92.04
24323	PORTAL	1	10.34
24234	RECTRSVC	1	0
24456	BOREL	1	5.8
24422	PALMDALE	1	1
24457	ARBWIND	1	15.8
24458	ENCANWND	1	81.6
24459	FLOWIND	1	29.5

24460	DUTCHWND	1	10.2
24436	GOLDTOWN	1	13
24437	KERNRVR	1	23.51
24465	MORWIND	1	39.3
24491	OAKWIND	1	0
28501	MIDWIND	1	12.9
28502	SOUTHWND	1	4.8
28503	NORTHWND	1	14
28504	ZONDWND1	1	9.5
28505	ZONDWND2	1	9.3
28506	BREEZE1	1	3.3
28507	BREEZE2	1	5.8
	Total 2009 and 2011		**5250.4**

Critical Contingency Analysis Summary

Big Creek/Ventura overall:

The most critical contingency is the loss of the Lugo-Victorville 500 kV followed by Sylmar-Pardee #1 or #2 230 kV line, which would thermally overload the remaining Sylmar-Pardee #1 or #2 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 3,765 MW in 2009 and 4,140 MW in 2011 (which includes 1,137 MW of QF generation) as the minimum generation capacity necessary for reliable load serving capability within this area.

The single most critical contingency is the loss of Sylmar-Pardee #1 (or # 2) line followed by Ormond Beach Unit # 2, which would thermally overload the remaining Sylmar-Pardee #1 or #2 230 kV line. This limiting contingency establishes a Local Capacity Requirement of 3,480 MW in 2009 and 3,795 MW in 2011 (which includes 1,137 MW of QF generation).

Effectiveness factors:

The following table has units that have at least 5% effectiveness to the above-mentioned constraint within the Big Creek/Ventura area:

Gen Bus	**Gen Name**	**Gen ID**	Eff Fctr (%)
24107	ORMOND1G	1	32
24108	ORMOND2G	2	32
24009	APPGEN1G	1	31
24010	APPGEN2G	2	31
24118	PITCHGEN	1	31

24148	TENNGEN1	1	31
24149	TENNGEN2	2	31
25651	WARNE1	1	30
25652	WARNE2	1	30
28055	PSTRIAS2	S2	28
28054	PSTRIAG3	G3	28
28052	PSTRIAG2	G2	28
28053	PSTRIAS1	S1	27
28051	PSTRIAG1	G1	27
24089	MANDLY1G	1	27
24090	MANDLY2G	2	27
24102	OMAR 1G	1	26
24103	OMAR 2G	2	26
24104	OMAR 3G	3	26
24110	OXGEN	1	26
24119	PROCGEN	1	26
24143	SYCCYN1G	1	26
24144	SYCCYN2G	2	26
24145	SYCCYN3G	3	26
24146	SYCCYN4G	4	26
24159	WILLAMET	1	26
25614	OSO A P	1	26
25614	OSO A P	2	26
25615	OSO B P	7	26
25615	OSO B P	8	26
25653	ALAMO SC	1	26
24127	S.CLARA	1	26
28004	ELLWOOD	1	26
24105	OMAR 4G	4	25
24150	ULTRAGEN	1	25
24113	PANDOL	1	24
24113	PANDOL	2	24
28008	LAKEGEN	1	24
24152	VESTAL	1	24
24319	EASTWOOD	1	24
24307	B CRK1-2	3	24
24307	B CRK1-2	4	24
24308	B CRK2-1	1	24
24308	B CRK2-1	2	24
24310	B CRK2-3	5	24
24310	B CRK2-3	6	24
24311	B CRK3-1	1	24
24311	B CRK3-1	2	24
24312	B CRK3-2	3	24
24312	B CRK3-2	4	24
24313	B CRK3-3	5	24
24314	B CRK 4	41	24
24314	B CRK 4	42	24
24315	B CRK 8	81	24
24315	B CRK 8	82	24

24317	MAMOTH1G	1	24
24318	MAMOTH2G	2	24
24306	B CRK1-1	1	23
24306	B CRK1-1	2	23
24309	B CRK2-2	3	23
24309	B CRK2-2	4	23
24437	KERNRVR	1	20
24222	MANDLY3G	3	18
24456	BOREL	1	14
24457	ARBWIND	1	14
24458	ENCANWND	1	14
24459	FLOWIND	1	14
24460	DUTCHWND	1	14
24436	GOLDTOWN	1	14
24465	MORWIND	1	14
28501	MIDWIND	1	14
28503	NORTHWND	1	14
28504	ZONDWND1	1	14
28505	ZONDWND2	1	14

Big Creek/Ventura Overall Requirements:

2009 and 2011	QF/Wind (MW)	Muni (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	1137	-	4113	5250

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[26]	3480	0	3480
Category C (Multiple)[27]	3765	0	3765

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[26]	3795	0	3795
Category C (Multiple)[27]	4140	0	4140

10. San Diego Area

Area Definition

The transmission tie lines forming a boundary around San Diego include:

[26] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[27] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.

1) Imperial Valley – Miguel 500 kV Line
2) Otay Mesa – Tijuana 230 kV Line
3) San Onofre - San Luis Rey #1 230 kV Line
4) San Onofre - San Luis Rey #2 230 kV Line
5) San Onofre - San Luis Rey #3 230 kV Line
6) San Onofre – Talega #1 230 kV Line
7) San Onofre – Talega #2 230 kV Line
8) San Felipe – Central 500 kV Line (in 2011 only)

The substations that delineate the San Diego Area are:

1) Imperial Valley is out Miguel is in
2) Otay Mesa is in Tijuana is out
3) San Onofre is out San Luis Rey is in
4) San Onofre is out San Luis Rey is in
5) San Onofre is out San Luis Rey is in
6) San Onofre is out Talega is in
7) San Onofre is out Talega is in
8) San Felipe is out Central is in (in 2011 only)

Total 2009 busload within the defined area: 4843 MW with 120 MW of losses resulting in total load + losses of 4963 MW. Total 2011 busload within the defined area: 4973 MW with 150 MW of losses resulting in total load + losses of 5129 MW.

Total units and qualifying capacity available in this area:

No	Name	ID	Qualifying Capacity
22088	BOULEVRD	1	0.5
22092	CABRILLO	1	3.6
22172	DIVISION	1	46.9
22212	ELCAJNGT	1	15
22233	ENCINA 1	1	103.5
22234	ENCINA 2	1	104
22236	ENCINA 3	1	110
22240	ENCINA 4	1	300
22244	ENCINA 5	1	330
22248	ENCINAGT	1	15
22332	GOALLINE	1	50
22376	KEARN3CD	1	15.3
22384	KYOCERA	1	0.1
22480	MIRAMAR	1	2.7
22488	MIRAMRGT	1	18
22532	MURRAY	1	0.5
22576	NOISLMTR	1	35.3
22660	POINTLMA	1	21.8
22680	R.SNTAFE	1	0.5

22688	RINCON	1	0.5
22704	SAMPSON	1	13.6
22724	SANMRCOS	1	1.1
22776	SOUTHBGT	1	13
22780	SOUTHBY1	1	145
22784	SOUTHBY2	1	149
22788	SOUTHBY3	1	174
22792	SOUTHBY4	1	221
22820	SWEETWTR	1	0.5
22120	CARLTNHS	1	1.1
22149	CALPK_BD	1	42
22153	CALPK_ES	1	45.5
22150	CALPK_EC	1	42
22604	OTAY	1	3
22373	KEARN2AB	1	14.8
22373	KEARN2AB	2	14.8
22374	KEARN2CD	1	14.8
22374	KEARN2CD	2	14.8
22375	KEARN3AB	1	15.3
22375	KEARN3AB	2	15.3
22376	KEARN3CD	2	15.3
22377	KEARNGT1	1	16
22488	MIRAMRGT	2	18
22074	LRKSPBD1	1	46
22075	LRKSPBD2	1	46
22257	RAMCO_ES	1	40
22617	RAMCO_OY	1	42
22834	TALEGA	SC	0
22486	MEF	1	45
22262	PEN_CT1	1	177
22263	PEN_CT2	1	177
22265	PEN_ST	1	187
22904	CAMPOGEN	1	10
22904	CAMPOGEN	2	0
	2007 TOTAL		**2932**
22605	OTAYMGT1	1	170
22606	OTAYMGT2	1	170
22607	OTAYMST1	1	221
22625	LKHODG1	1	20
22626	LKHODG2	2	20
	2009&2011 TOTAL		**3533**

Additional units available in 2011 for the Greater Imperial Valley-San Diego area:

22981	IV GEN1	1	241
22982	IV GEN2	1	180
22983	IVGEN2	1	180

22996	INTBST	1	150
22997	INTBST	2	75
	2011 Additional		**826**

Critical Contingency Analysis Summary

South Bay Sub-Area:

Without South Bay Power Plant, the 2011 study base case provide by SDG&E indicates the following study results:

a. South Bay 138/69 kV transformer would have 113% loading based on the 143 MVA summer emergency rating following the loss of the Silvergate 230/69 kV transformer and the Old Town – Kettner 69 kV line.
b. The Sycamore – Carlton Hills Tap 138 kV line would have 110% loading based on the 1033 amps summer rating following the loss of the Sycamore – Penasquitos 230 kV line and the Sycamore – Chicarita 138 kV line.
c. Old Town 230/69 kV transformer bank #2 would have 104% loading based on the 239 MVA summer emergency rating following the loss of the Old Town 230/69 kV transformer bank #1 and the Miguel – Proctor Valley 138 kV line.
d. The B – Kettner 69 kV would have 103% loading based on the 1632 amps summer rating following the loss of the Miguel – Imperial Valley 500 kV line and Silvergate 230/69 kV transformer.

For these contingencies the study showed that without an operating procedure or transmission facility upgrades, the South Bay units are the only effective units to mitigate above four criteria violations.

San Diego overall:

In 2009 the most limiting contingency in the San Diego area is described by the outage of the 500 kV Southwest Power Link (SWPL) between Imperial Valley and Miguel Substations over-lapping with an outage of the Otay Mesa Combined-Cycle Power plant (561 MW) while staying within the South of San Onofre (WECC Path 44) non-simultaneous import capability rating of 2,500 MW. Therefore in 2009 the 3,024 MW (includes 181 MW of QF generation and 10 MW of wind) of capacity required within this

area is predicated on having sufficient generation in the San Diego Area to reduce Path 44 to its non-simultaneous rating of 2,500 MW within 30 minutes.

In 2011 the most limiting contingency in the San Diego area is described by the outage of the 500 kV Southwest Power Link (SWPL) between Imperial Valley and Miguel Substations with the Otay Mesa Combined-Cycle Power plant (561 MW) out of service while staying within the maximum import achieved after the new Imperial Valley-San Felipe-Central 500 kV is in service (3,500 MW). Therefore in 2011 the 2,190 MW (includes 181 MW of QF generation and 10 MW of wind) of capacity required within this area is predicated on having sufficient generation in the San Diego Area to reduce imports to 3,500 MW. The outage of 500 kV Southwest Power Link (SWPL) between Imperial Valley and Miguel Substations followed by San Felipe-Central 500 kV line will push the flow on South of San Onofre (WECC Path 44) to above its 2,500 MW rating; however all equipment will be within Applicable Rating. For consideration of LCR and in order to return the system to the import capability rating of Path 44 to 2,500 MW (within 30 minutes) the reliability criteria would permit load drop in San Diego if additional resource capacity in the area is not available.

Also in 2011 the most limiting contingency in the Greater Imperial Valley-San Diego area is described by the outage of 500 kV Southwest Power Link (SWPL) between Imperial Valley and N. Gila Substations over-lapping with an outage of the Otay Mesa Combined-Cycle Power plant (561 MW) while staying within the South of San Onofre (WECC Path 44) non-simultaneous import capability rating of 2,500 MW. Therefore 3,190 MW (includes 181 MW of QF generation and 10 MW of wind) of capacity (minus the additional import capability from IID achieved at the new San Felipe substation) is required within this combined area in order to reduce Path 44 to its non-simultaneous rating of 2,500 MW within 30 minutes.

Effectiveness factors:

All units within this area have the same effectiveness factor. Units outside of this area are not effective.

San Diego Overall Requirements:

	QF (MW)	Wind (MW)	Market (MW)	Max. Qualifying Capacity (MW)
Available generation	181	10	3342	3533

2009	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[28]	3024	0	3024
Category C (Multiple)[29]	3024	0	3024

2011	Existing Generation Capacity Needed (MW)	Deficiency (MW)	Total MW Requirement
Category B (Single)[28]	2190	0	2190
Category C (Multiple)[29]	2190	0	2190

[28] A single contingency means that the system will be able the survive the loss of a single element, however the operators will not have any means (other then load drop) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.
[29] Multiple contingencies means that the system will be able the survive the loss of a single element, and the operators will have enough generation (other operating procedures) in order to bring the system within a safe operating zone and get prepared for the next contingency as required by MORC.