



FEASIBILITY STUDY

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EXECUTIVE SUMMARY

[REDACTED] applied to Southern California Edison ("SCE") for distribution service under the terms of SCE's Wholesale Distribution Access Tariff ("WDAT"). [REDACTED] LLC will own and operate a 49.9 MW generating facility [REDACTED] to be interconnected at a new interconnection facility [REDACTED] to be constructed by [REDACTED]. [REDACTED] will be served by looping in an existing SCE's 66kV line. Distribution service pursuant to the WDAT is proposed to be from [REDACTED] to the California Independent System Operator ("ISO") grid at SCE's 230 kV Chino Substation. The proposed in-service date of the [REDACTED] is June 1, 2007.

The [REDACTED] is a generation system consisting of [REDACTED] 13.8 kV, 71.2 KVA LM6000 Gas Turbine in simple cycle mode of operation with a net generation export of 49.9 MW. The generation facility will utilize [REDACTED] 57.2 MVA, 13.8 kV/66 kV step-up transformer to interconnect the generator to the SCE's system. As requested by [REDACTED] SCE performed a Feasibility Study to identify the general electrical system impacts of the [REDACTED] possible mitigation measures to maintain conformance with SCE, ISO, or other applicable reliability planning criteria, and non-binding order of magnitude cost estimates for these mitigation measures.

The Feasibility Study consisted of a power flow analysis and a three-phase short circuit duty analysis to determine whether the energy associated with the [REDACTED] can be transmitted through SCE's system to the ISO grid at [REDACTED] without creating the need for modifications to SCE's system and/or the ISO grid. The study showed that, with the [REDACTED] on-line:

- Thermal loadings on the SCE subtransmission facilities used to provide the requested WDAT service were all within criteria limits.
- During both summer and spring conditions, [REDACTED] increases prior overloads by 1% on Mira Loma – Walnut 230kV #1 line under the outages of Chino – MiraLoma 230kV #3 line and Mira Loma – Olinda 230kV #1 line.
- A review of circuit breaker interrupting capabilities at these locations determined that [REDACTED] 66 kV circuit breakers and [REDACTED] 230 kV circuit breaker will need to be replaced as a result of the [REDACTED].

Non-binding order of magnitude cost estimates for the required interconnection facilities and system upgrades are as follows:

[REDACTED]	- Amount includes 35% ITCC tax	\$3.915M
Protection Upgrades (Three Substations)	- Amount includes 35% ITCC tax	\$0.405M
66 kV system line upgrades		\$0.0M
ISO transmission system upgrades		\$0.0M
Circuit breaker replacements (66 kV, 230 kV)	- Amount includes 35% ITCC tax	\$9.666M
Total non-binding order of magnitude cost estimate		\$13.986M

The estimated cost for the replacement of [REDACTED] 66 kV Circuit Breakers [REDACTED] 230 kV Circuit Breaker and the required system protection upgrades is approximately \$10,360,000. This amount is subject to ITCC which has been calculated to be \$3,626,000.

Additional system studies (i.e., single line-to-ground short circuit duty, transient stability, post-transient stability) will be performed and refined cost estimates will be developed in a subsequent System Impact Study and/or Facilities Study if requested by the customer.

CONTENTS

	<u>PAGE</u>
1. INTRODUCTION	1
2. STUDY CONDITIONS AND METHODOLOGY	2
2.A Planning Criteria	2
2.B System Load Conditions	2
2.C Power Flow Study	2
2.D Short-Circuit Duty Study	2
3. DISCUSSION OF STUDY RESULTS	3
3.A Power Flow Study	3
3.B Short-Circuit Duty Study	3
4. NON-BINDING ORDER OF MAGNITUDE COST ESTIMATES	4
5. CONCLUSIONS	4
 <u>APPENDIX</u>	
A. 2007 Chino System Power Flow	
B. 2013 Chino System Power Flow	
C. Transmission Assessment	

[REDACTED]

FEASIBILITY STUDY

August 14, 2005

1. INTRODUCTION

[REDACTED] applied to Southern California Edison ("SCE") for distribution service under the terms of SCE's Wholesale Distribution Access Tariff ("WDAT"). [REDACTED] will own and operate a 49.9 MW generating facility [REDACTED] to be interconnected at a new interconnection facility [REDACTED] to be constructed by SCE. In 2007 [REDACTED] will be served by looping in an existing SCE's 66kV line with one 66 KV line normally open as shown in Figure 1. It is projected that in 2008, the normally open switch will be closed thus proving [REDACTED] a looped system with both lines normally closed as that shown in figure 2.

Figure 1 – Proposed 66 kV Method of Service to [REDACTED] 2007

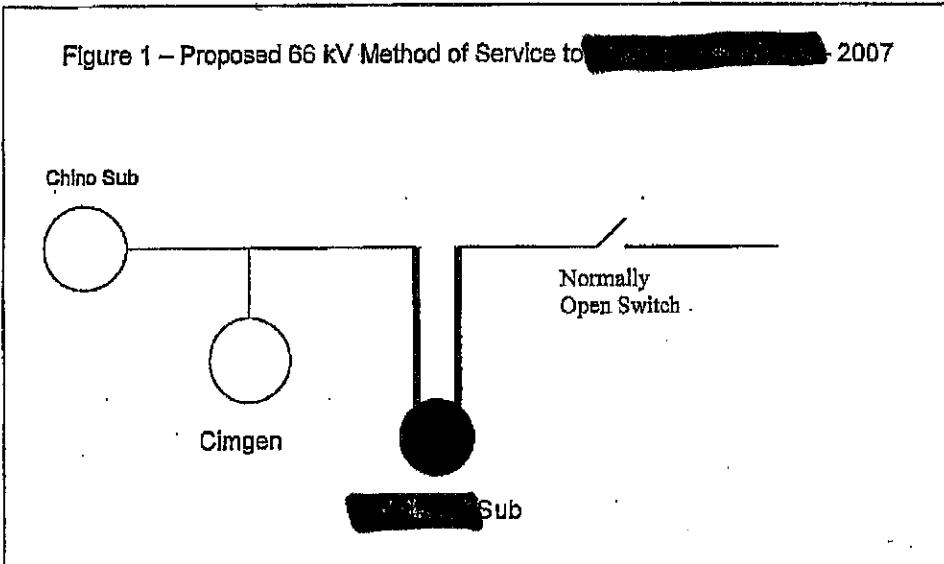
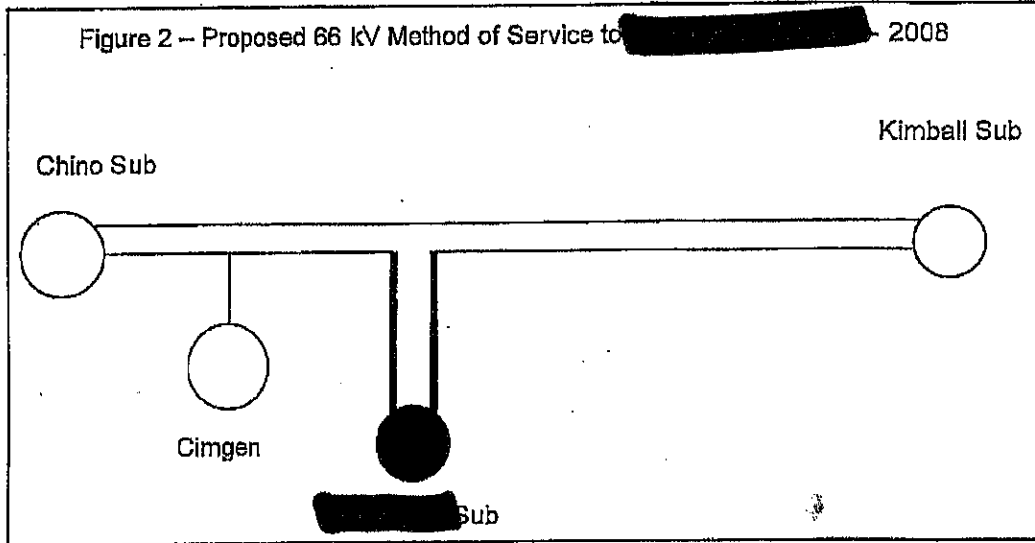


Figure 2 – Proposed 66 kV Method of Service to [REDACTED] 2008



Distribution service pursuant to the WDAT is proposed to be from [REDACTED] to the California Independent System Operator ("ISO") grid at SCE's 230 kV Chino Substation. The proposed in-service date of the [REDACTED] is June 1, 2007.

The [REDACTED] is a generation system consisting of [REDACTED] 13.8 kV, 71.2 KVA LM6000 Gas Turbine in simple cycle mode of operation with a net generation export of 49.9 MW. The generation facility will utilize [REDACTED] 67.2 MVA, 13.8 kV/66 kV step-up transformer to interconnect the generator to the SCE's system. As requested by [REDACTED] SCE performed a Feasibility Study to identify the general electrical impacts of the [REDACTED] possible mitigation measures to maintain conformance with SCE, ISO or other applicable reliability planning criteria, and non-binding order cost estimate for these mitigation measures.

The Feasibility Study consisted of a power flow analysis and a three-phase short-circuit duty analysis to determine whether the energy associated with the [REDACTED] can be transmitted through SCE's distribution system to the ISO grid at Chino Substation, without creating the need for modifications to SCE's distribution system and/or the ISO grid. This report describes the study conditions and assumptions and presents the results of the power flow and short-circuit duty analyses on SCE's Chino 66 kV subtransmission system. Appendix C details study results for the ISO-controlled transmission grid.

2. STUDY CONDITIONS AND METHODOLOGY

A. Planning Criteria

The study was conducted by applying SCE's planning criteria to the SCE facilities used to provide the requested WDAT service. Specifically, the main criteria applicable to this study are as follows:

Power Flow Criteria

Line loading should not exceed 100% of a conductor's thermal rating with all facilities in service (base case).

Line loading should not exceed 100% of a conductor's emergency rating with one line out of service (N-1).

Short-Circuit Duty Criteria

Short-circuit duty should not exceed a circuit breaker's interrupting capability with maximum area generation on-line.

B. System Load Conditions

The study considered two system load conditions: peak loads and light loads. The peak load forecast was based on SCE's 2005-2014 Distribution Substation Plan. The light load forecast was assumed to be 65% of the peak load forecast.

C. Power Flow Study

This study evaluated the [REDACTED] impact on line loadings for base case and N-1 conditions. Both peak load and light load conditions were modeled. Line loadings were monitored both with and without the [REDACTED] to determine if the addition of the [REDACTED] caused any violations of SCE's thermal loading criteria.

D. Short-Circuit Duty Study

This study evaluated the [REDACTED] impact on three-phase short-circuit duties seen by substation circuit breakers at the 66 kV level. Symmetrical three-phase fault currents and X/R ratios were calculated both with and without the [REDACTED] to determine if the addition of the [REDACTED] caused any violations of SCE's short-circuit duty criteria.

The dataset used for the short-circuit study represented all existing generation and all projects in the queue (up to and including the [REDACTED] as on-line. Substations where the [REDACTED] increased three-phase short-circuit duties by 0.1 kA or more were flagged, and circuit breaker interrupting capabilities were reviewed at these substations to determine if any circuit breakers required replacement as a result of the [REDACTED].

3. DISCUSSION OF STUDY RESULTS

A. Power Flow Study

For both peak load and light load conditions, the addition of the [REDACTED] caused no violations of SCE's thermal loading criteria under base case conditions.

For both peak load and light load conditions, the addition of the [REDACTED] caused no violations of SCE's thermal loading criteria under N-1 conditions.

B. Short-Circuit Duty Study

Table 1 below summarizes the impact of the [redacted] on symmetrical three-phase short-circuit duties and X/R ratios at various 66 kV buses on the SCE system. [redacted] buses were flagged where the [redacted] increased three-phase short-circuit duties by 0.1 kA or more. A review of circuit breaker interrupting capabilities at these locations determined that a total of [redacted] 66 kV circuit breakers will need to be replaced as a result of the [redacted]

Table 1: Three-Phase Short-Circuit Duty Summary

Bus	Increment
Chin	
Simj	
Con'	
Sani	
Trop	
Sop'	
Gan	
Diar	
Peyl	
Plas	
Soq	
Cinr	
Nari	
Frai	
Fire	

4. NON-BINDING ORDER OF MAGNITUDE COST ESTIMATES

Non-binding order of magnitude cost estimates for the required interconnection facilities and 66 kV system upgrades are as follows:

[redacted] - Includes 35% ITCC tax	\$3.915M
Protection upgrades (Three Substations) - Includes 35% ITCC tax	\$0.405M
66 kV system line upgrades	\$0.00M
66 kV circuit breaker replacements: Amount includes 35% ITCC tax	\$9.18M
Total non-binding order of magnitude cost estimate - 66 kV system	\$13.5M

The estimated cost for the replacement of [redacted] 66 kV Circuit Breakers and the required system protection upgrades is approximately \$10,000,000. This amount is subject to ITCC which has been calculated to be \$3,500,000

5. CONCLUSIONS

The results of this Feasibility Study showed that, with the [REDACTED] on-line:

- "Thermal loadings on the SCE subtransmission facilities used to provide the requested WDAT service were all within criteria limits."
- During both summer and spring conditions, [REDACTED] increases prior overloads by 1% on Mira Loma – Walnut 230kV #1 line under the outages of Chino – MiraLoma 230kV #3 line and Mira Loma – Olinda 230kV #1 line.
- A review of circuit breaker interrupting capabilities at these locations determined that [REDACTED] 66 kV circuit breakers and [REDACTED] 230 kV circuit breaker will need to be replaced as a result of the [REDACTED]

Non-binding order of magnitude cost estimates for the required interconnection facilities and 66 kV system upgrades are as follows:

[REDACTED]	- Includes 35% ITCC tax	\$3.915M
Protection Requirements (Three substations)	- Includes 35% ITCC tax	\$0.3M
66 kV system line upgrades		\$0.00M
66 kV circuit breaker replacements:	Amount includes 35% ITCC tax	\$9.18M
Total non-binding order of magnitude cost estimate – 66 kV system		\$13.5M

The estimated cost for the replacement of [REDACTED] 66 kV Circuit Breakers and the required system protection upgrades is approximately \$10,000,000. This amount is subject to ITCC which has been calculated to be \$3,500,000

Additional system studies (i.e., single line-to-ground short circuit duty, transient stability, post-transient stability) will be performed and refined cost estimates will be developed in a subsequent System Impact Study and/or Facilities Study if requested by the customer.

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CEII REGULATIONS**