



SYSTEM IMPACT RE-STUDY

May 19, 2008

Prepared by:

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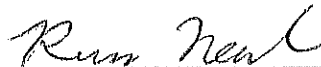


SOUTHERN CALIFORNIA
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Approved by:



Russ Neal
Engineering Manager

EXECUTIVE SUMMARY

[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 47.2 MW generating facility [REDACTED] to be interconnected at a new interconnection facility [REDACTED] to be constructed by SCE. The [REDACTED] will be served by tapping off the existing Gonzales-Mandalay 66kV line. Distribution service pursuant to the WDAT is proposed to be from [REDACTED] Project to the California Independent System Operator ("ISO") grid at SCE's 230 kV Santa Clara Substation. The proposed in-service date of [REDACTED] is August 19, 2008. The re-study for [REDACTED] was caused by the withdrawal of CAISO application queue no. 88. The re-study includes a new 3-phase Short Circuit Duty study based on the new queue Thevenin Equivalent provided by the Transmission Interconnection Planning Group. The re-study includes a new load flow analysis. The re-study does not include updated cost estimates. The re-study does not include a new Protection provided Single-Line to Ground Short Circuit Duty study in accordance with good engineering practice as previous study showed that the 3-phase duty is higher than Single-Line to Ground Duty. The re-study does not include an Apparatus re-review of the breakers as the same breakers previously identified as over-dutied are still shown to need replacement.

The [REDACTED] is a generation system consisting of [REDACTED] 13.8 kV, 71.2 MVA General Electric LM6000 PC-Spring gas fired turbine-generator, with a net generation export of 47.2 MW. The generation facility will utilize a [REDACTED] 45/75 MVA (OA/FA MVA rating), 13.8/66 kV step-up transformer to interconnect to the generator to SCE's system. As requested by [REDACTED] SCE performed a System Impact Study to identify the general electrical system impacts of the [REDACTED] possible mitigation measures to maintain conformance with SCE, ISO, and other applicable reliability planning criteria, and non-binding order of magnitude cost estimates for these mitigation measures.

The System Impact Study consisted of a power flow analysis, three-phase and single-line-to-ground short circuit duty analysis to determine whether the power associated with the [REDACTED] can be transmitted through SCE's distribution system to the ISO 230 kV grid at Santa Clara Substation without creating the need for modifications to SCE's distribution system and/or the ISO grid. The study showed that, with the [REDACTED] on-line:

- The Sub-transmission System Power Flow study results showed no thermal overloads.
- Appendix B details study results for the ISO-controlled transmission grid.
- 31-66 kV circuit breakers and 0-230 kV circuit breakers will need to be upgraded due to the [REDACTED]

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

Interconnection (Substation and 66kV tie line)	\$1.86 M
Protection Upgrades	\$0.30 M
New IT Facilities	\$0.25 M
RTU at [REDACTED]	\$0.05 M
66 kV system line upgrades	\$0.00 M
Circuit breaker replacements (66 kV, 230 kV)	\$5.83 M
35% ITCC tax	\$2.9 M
Total non-binding order of magnitude cost estimate	\$11.19 M

Additional system studies (i.e., transient stability) will not be required unless requested by a third party. Refined cost estimates will be developed in a subsequent Facilities Study if requested by GBU. Non-binding cost estimate does not include any Public Utility Commission General Order (GO) 131-D costs.

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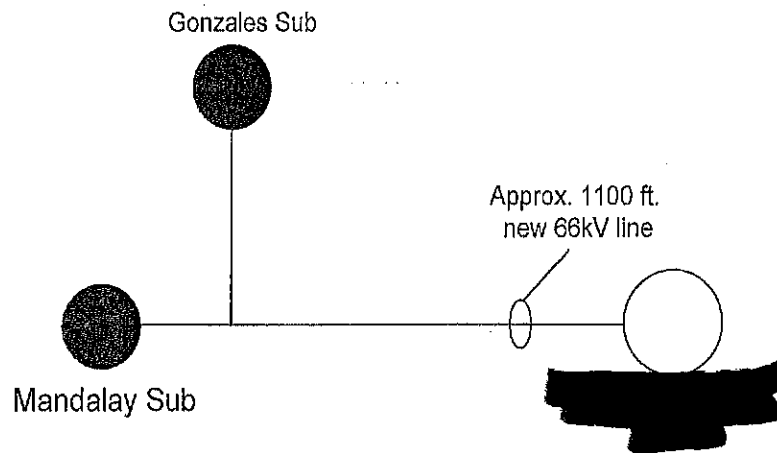
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SYSTEM IMPACT RE-STUDY

May 7, 2008

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 47.2 MW generating facility [REDACTED] to be interconnected at a new interconnection facility [REDACTED] to be constructed by SCE. [REDACTED] will be served by tapping off the existing Gonzales-Mandalay 66kV line. (see Figure 1 below).



Distribution service pursuant to the WDAT is proposed to be from [REDACTED] Project to the California Independent System Operator ("ISO") grid at SCE's 230 kV Santa Clara Substation. The proposed in-service date of the [REDACTED] is August 19, 2008.

The [REDACTED] is a generation system consisting of [REDACTED] 13.8 kV, 71.2 [REDACTED] package which will include: Selective Catalytic Reduction, Gas Compressor, Water Injection, Black Start Capability, and Continuous Emissions Monitoring system, with a net generation export of 47.2 MW. The generation facility will utilize [REDACTED] 45/75 MVA (OA/FA MVA ratings), 13.8/66 kV step-up transformer to interconnect to the generator to SCE's system. As requested by [REDACTED] SCE performed a System Impact Study to identify the general electrical system impacts of the [REDACTED] possible mitigation measures to maintain conformance with SCE, ISO, and other applicable reliability planning criteria, and non-binding order of magnitude cost estimates for these mitigation measures.

The System Impact Study consisted of a power flow analysis, three-phase and single-line-to-ground short circuit duty analysis to determine whether the power associated with the

[REDACTED] can be transmitted through SCE's distribution system to the ISO 230kV grid at Santa Clara 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 analysis on SCE's Santa Clara 66kV sub-transmission system. Appendix B 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 normal thermal rating with all facilities in service (base case).

Line loading should not exceed 100% of a conductor's emergency thermal 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 2007-2016 Distribution Substation Plan. The light load forecast was assumed to be 33% 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 substation circuit breakers at the 66 kV level based on three-phase and line-to-ground short-circuit duty contributions from the generating facility. 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 identified, and circuit breaker interrupting capabilities were reviewed at these substations to determine if any circuit breakers required replacement as a result of the [REDACTED] short-circuit duty contributions.

3. DISCUSSION OF STUDY RESULTS

A. Power Flow Study

There were no violations under light load (33% of peak) conditions. There were no violations under peak load conditions.

For light load conditions, the addition of the [REDACTED] caused no violations of SCE's thermal loading criteria under N-1 conditions. For peak 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 [REDACTED] phase short-circuit duties and X/R ratios at various 66 kV buses on the SCE system. [REDACTED] buses were identified 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 31 - 66kV circuit breakers will need to be replaced as a result of the [REDACTED]

Table 1: Short-Circuit Duty Summary (3-Phase Re-Study)
Applicational Queue

4. NON-BINDING ORDER OF MAGNITUDE COST ESTIMATES

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

Interconnection (Substation and 66kV tie line)	\$1.86 M
Protection Upgrades	\$0.30 M
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35% ITCC tax	\$2.9 M
Total non-binding order of magnitude cost estimate	\$11.19 M

Additional system studies (i.e., transient stability) will not be required unless requested by a third party. Refined cost estimates will be developed in a subsequent Facilities Study if requested by [REDACTED]. Non-binding cost estimate does not include any Public Utility Commission General Order (GO) 131-D costs.

5. CONCLUSIONS

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

- The Sub-transmission System Power Flow study results showed no thermal overloads.
- Appendix B details study results for the ISO-controlled transmission grid.
- 31-66 kV circuit breakers and 0-230 kV circuit breakers will need to be upgraded due to the McGrath Beach Peaker Project.

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

Interconnection (Substation and 66kV tie line)	\$1.86 M
Protection Upgrades	\$0.30 M
New IT Facilities	\$0.25 M
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CEII REGULATIONS**