[redacted]

[redacted]

WDT357

WDAT
SYSTEM IMPACT STUDY

November 10, 2011

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL*[SM] Company

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SOUTHERN CALIFORNIA EDISON COMPANY

EXECUTIVE SUMMARY

[redacted] applied to Southern California Edison ("SCE") for interconnection and wholesale distribution service for its proposed [redacted] (Project) pursuant to SCE's Wholesale Distribution Access Tariff ("WDAT") Small Generator Interconnection Procedures ("SGIP"). SCE performed a System Impact Study ("Study") as requested by [redacted] for a 33 kV interconnection and distribution service from an existing 33 kV distribution line ("Chanslor 33 kV"). The interconnection is to be located approximately 1.0 miles from [redacted] on the Chanslor 33 kV circuit out of SCE's [redacted] 161/33 kV Substation. The request is for a photovoltaic ("PV") generation facility with a total capacity of 20 MW. The initial request is for service to commence by [redacted]

The proposed [redacted] consisting of photovoltaic panels, [redacted] inverters, and [redacted] transformer, will receive interconnection service from SCE's existing 33 kV circuitry on the Chanslor 33 kV out of [redacted] via an overhead line extension to the applicant-owned 33 kV breaker. The generated power would be delivered to the California Independent System Operator ("CAISO") grid at the 161 kV bus of SCE's [redacted]

The purpose of this System Impact Study is to determine the effect of the proposed generation addition on the SCE distribution system and the portion of SCE's electrical system that is part of the CAISO controlled grid, and to identify in general Interconnection Facilities, Distribution Upgrades, additions or modifications, or other facilities required to provide the requested service. The Study was performed in two parts: Part A (performed by SCE's Distribution Field Engineering department) examines impacts related to that part of the SCE distribution system energized at less than 161 kV and also briefly summarizes the results of Part B, while Part B (performed by SCE's Generation Interconnection Planning department) examines impacts and facilities related to the portion of the SCE electrical system energized at 161 kV, and impacts and facilities associated with the CAISO controlled portion of the SCE grid (the bulk power system). This is the Part A study report; a detailed report of the Part B study results is included as Attachment B.

The Part A Study was performed for expected year 2011 through 2019 projected peak load conditions as well as 2011 through 2019 minimum load conditions.

The Part A Study consisted of a power flow analysis, three-phase short circuit duty analysis and circuit voltage profile analysis. The analyses were performed to determine whether the energy associated with the [redacted] can be transmitted through SCE's distribution system to the CAISO grid at the 161 kV bus of SCE's [redacted] without creating the need for modifications to SCE's distribution system and/or to the CAISO grid. The Part A Study showed that, with the [redacted] on-line:

- For both peak load and light load conditions, the addition of the 20 MW [redacted] resulted in a violations of SCE's thermal loading criteria under base case conditions for the SCE distribution system. However no violations were found under N-1 conditions.

[1] Date as requested in the application. Actual operating date depends on design, procurement, and construction requirements.

- The proposed Point of Interconnection was changed from the Chanslor 33kV line to the Mc Coy 33kV line as a way to mitigate an overload issue. Details of the overload are explained in the Thermal Loading section of this report.

- The addition of the 20 MW [redacted] resulted in a voltage rise not exceeding the allowable Rule 2 limits.

- The addition of the 20 MW [redacted] resulted in the increase of three-phase short-circuit duties of 0.1kA or more at [redacted] distribution substations. The circuit breaker interrupting capabilities were reviewed at these substations and it was determined tha[redacted] circuit breakers will be required to be upgraded.

- Non-binding order of magnitude cost estimates for the required interconnection facilities and 33 kV system upgrades are as follows

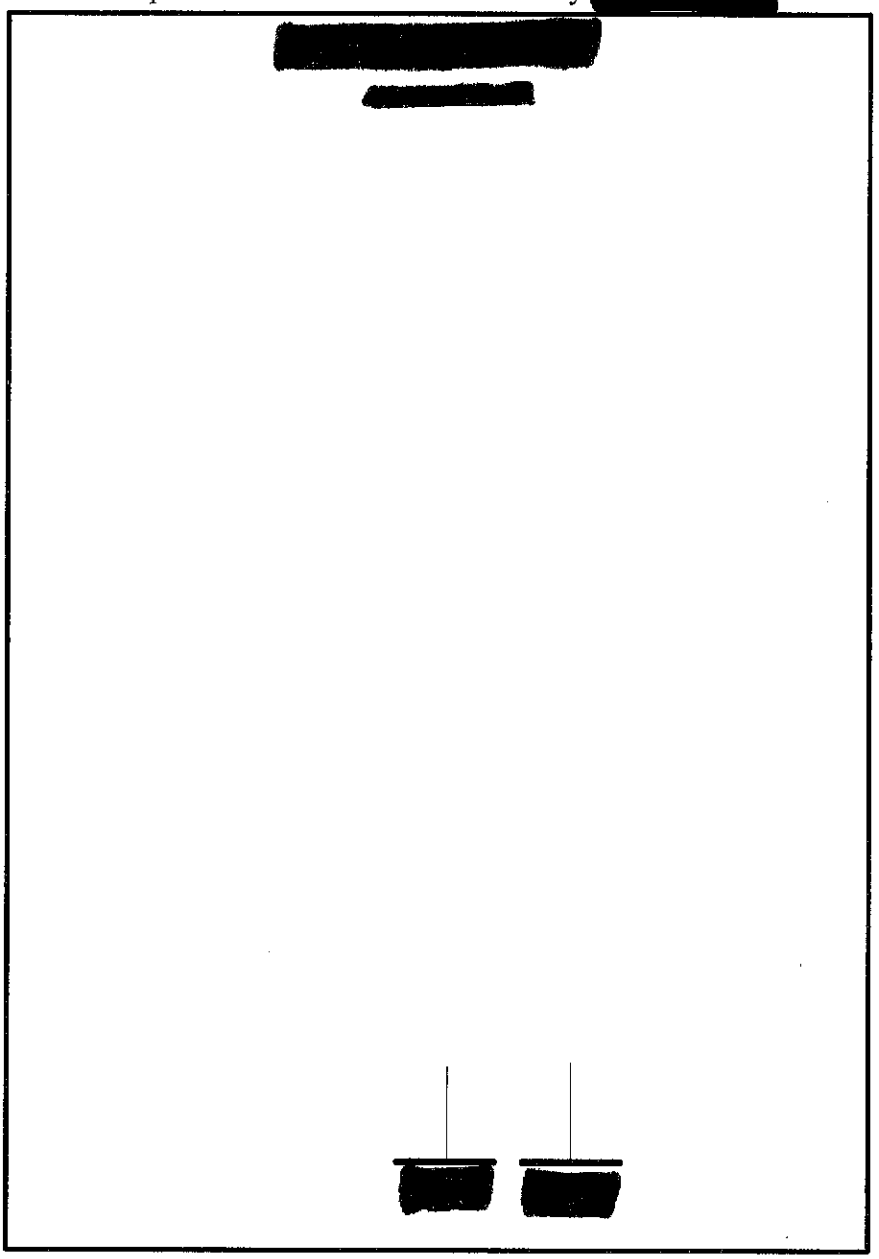
Interconnection Facilities/Automation	$ 0.722 M
o 33 KV circuit extension	
o Remote Controlled Switch	
o Pole top metering	
Telemetry Requirements	$ 0.212 M
o Remote Terminal Unit	
o Telecommunication System for RTU	
Distribution Upgrades (33 kV circuit)	
o New Remote Automated Re-Closer (RAR)	$ 0.104 M
Total non-binding order of magnitude cost estimate	$ 1.038 M[2]

[2] Cost estimate includes 35% ITCC

CONTENTS

I. INTRODUCTION TO PART A

[redacted] applied to Southern California Edison ("SCE") for interconnection and wholesale distribution service for its proposed [redacted] (Project) pursuant to SCE's Wholesale Distribution Access Tariff ("WDAT") Small Generator Interconnection Procedures ("SGIP"). SCE performed a System Impact Study ("Study") as requested by [redacted] for a 33 kV interconnection and distribution service from an existing 33 kV distribution line ("Chanslor 33 kV"). The interconnection is to be located approximately 1.0 miles from [redacted] on the Chanslor 33 kV circuit out of SCE's [redacted] 161/33 kV Substation. The request is for a photovoltaic ("PV") generation facility with a total capacity of 20 MW. The initial request is for service to commence by [redacted]



[3] Date as requested in the application. Actual operating date depends on design, procurement, and construction requirements.

The proposed [redacted] consisting of photovoltaic panels [redacted] inverters, and [redacted] transformer, will receive interconnection service from SCE's existing 33 kV circuitry on the Chanslor 33 kV out of [redacted] via an overhead line extension to the applicant-owned 33 kV breaker. The generated power would be delivered to the California Independent System Operator ("CAISO") grid at the 161 kV bus of SCE's [redacted]

The purpose of this System Impact Study is to determine the effect of the proposed generation addition on the SCE distribution system and the portion of SCE's electrical system that is part of the CAISO controlled grid, and to identify in general Interconnection Facilities, Distribution Upgrades, additions or modifications, or other facilities required to provide the requested service. The Study was performed in two parts: Part A (performed by SCE's Distribution Field Engineering department) examines impacts related to that part of the SCE distribution system energized at less than 161 kV and also briefly summarizes the results of Part B, while Part B (performed by SCE's Generation Interconnection Planning department) examines impacts and facilities related to the portion of the SCE electrical system energized at 161 kV, and impacts and facilities associated with the CAISO controlled portion of the SCE grid (the bulk power system). This is the Part A study report; a detailed report of the Part B study results is included as Attachment B.

II. PART A: SYSTEM IMPACT STUDY CONDITIONS & METHODOLOGY

Planning Criteria

The thermal rating of any conductor, connector, or apparatus should not exceed 100% of its normal rated capacity with all facilities in service (base case).

The thermal rating of any conductor, connector, or apparatus should not exceed 100% of its emergency rating under N-1 conditions.

Operational flexibility and reliability of the distribution system shall be maintained at all times.

Circuit voltage profiles should be maintained to comply within CPUC's Rule-2 requirements.

System Conditions

The power factor for the new generation facility was assumed to be improved to within WDAT requirements of 0.95 lagging or leading, except as specifically enumerated herein.

Expected loading on the distribution system as projected by the SCE 2011 - 2019 plan was used.

Generation resources connected to the distribution system are analyzed offline and online during peak load and minimum load conditions during the day as to determine worst case scenario.

Short circuit contribution from the inverter system as provided by the applicant.

The proposed Point of Interconnection was changed from the Chanslor 33kV line to the Mc Coy 33kV line as a way to mitigate an overload issue. The Part A portion of the System Impact

Study is based on this change. Details of the overload are explained in the Thermal Loading section of this report.

III. PART A: SYSTEM IMPACT STUDY RESULTS

Short Circuit Analysis

Using the short circuit models from the inverter systems being utilized in this solar generation system it was calculated that the short circuit contribution at [redacted] 33kV substation buses were more than 0.1kA thus a breaker analysis was required due to this generation. The circuit breaker analysis concluded that [redacted] breakers replacements are required as part of this project.

System Protection Considerations

Some changes to the protection system of the SCE electrical system are required on the Mc Coy 33kV Line due to the addition of the [redacted] generation. The changes to the SCE protection system include the addition of an SCE Remote Automated Re-closer (RAR) and some changes in relay settings. The applicant is required to complete system coordination studies to insure the adequate coordination between SCE relays and applicant owned relays.

Thermal Loading

The line section of the Chanslor 33 kV between the customer's facility and the 33kV Point of Interconnection is expected to experience a total reverse power flow of 20MW. Of that 20MW, approximately 19MW will flow back towards the 33kV bus at [redacted] 161/33kV Substation, during minimum loading, maximum generation, and unity power factor. A thermal overload is triggered due to this reversal of power flow under base case conditions. Approximately 0.2 miles of 336 ACSR is loaded to approximately 111%. However, no thermal violations are triggered under N-1 conditions. The proposed mitigation to this overload is to change the Point of Interconnection the Mc Coy 33kV line. No thermal overloads are calculated due to the reversal of power flow under base case or N-1 conditions on the Mc Coy 33kV line.

Distribution Voltage Control

The 33kV distribution lines out of SCE's [redacted] and the bus at SCE's [redacted] are expected to experience a voltage rise which would not exceed the allowable CPUC Rule 2 requirements due to the addition of the 20MW [redacted] A delta of 0.7% is calculated under the generating facility conditions of maximum generation and unity power factor. No mitigation is necessary to operate the generating facility within the allowable limits of Rule 2 under base case or N-1 conditions.

Harmonic impact

The harmonic impact of the subject inverter based generation was not part of this System Impact Study. Despite the relatively low THD (<3%) of the equipment, impacts on voltage distortion levels may be significant due to the high penetration level of the generation facility with respect to the local distribution grid strength. As with all equipment connected to the SCE distribution system, the generation project will be subject to the provisions of Rule 2.E, allowing SCE to require customer mitigation of interference with SCE service, including harmonic impacts, if harmonic interference is caused by the customer. Since the THD values which were provided are for individual inverters and not for the total generation requested, it will be required to determine the total harmonic contribution for the entire generation facility prior to approving the

generation to interconnect to the SCE distribution system. Given the amount of generation and the strength of the distribution system, SCE will require a harmonic study and encourages that the applicant completes the study during the Facility Study Phase. During the commissioning test of the generation system, SCE will be part of the commissioning test, install power quality equipment to verify that the total harmonic contribution from the generation system to the SCE distribution system meets the required standards. If during the commissioning test, it is found that the project does not meet the harmonic standards, the project will not be allowed to interconnect to the SCE system until the harmonic deviations are rectified. Therefore, it is encouraged that the applicant completes a harmonic study during the Facility Study to insure that the harmonic requirements are met. SCE will provide the required SCE distribution system data that are to be used as part of the harmonic study.

IV. PART A: GENERAL DESCRIPTION OF IDENTIFIED UPGRADES

Distribution Upgrades

The addition of this project requires Distribution Upgrades. The Distribution Upgrades include installing a 33 kV RAR for the purpose of protection coordination on the SCE system. The cost estimate for the required Distribution Upgrades is $0.104 M.

Interconnection Facilities

Electrical Systems

Interconnection Facilities include installing approximately 4000' of 33kV 336 ACSR line extension from the existing Mc Coy 33kV line to the [redacted] installation of a new overhead RCS switch, a new overhead pole switch, a 33kV overhead line extension of approximately 600' between the newly extended 33kV line and applicant's breaker, ground detector, pole-top metering CTs, meters, and associated wiring. The cost estimate for the required Interconnection facilities is $0.722 M.

Telemetry requirements

Real-time telemetry will be required. In order to provide the adequate telemetry requirements, a RTU and Telecom will be required. The cost estimate required by PSC and Telecom is $0.212 M.

This cost estimate assumes that a local phone company will be able to provide a T1 line to the project location. If a local phone company cannot provide a T1 line, the cost estimate for the telecom portion will increase significantly.

Customer Equipment

The interface protection will be provided by the applicant and will include a 33 kV overhead Breaker. The pole-head configuration will be reviewed and approved by SCE Field Engineering. The applicant's protection must be coordinated with SCE's system circuit breaker controls to provide adequate protection for the distribution system. The relay settings are subject to SCE approval prior to setting and certified timed trip testing report results using primary injection will need to be provided to SCE to verify relay and circuit breaker performance prior to energizing the service.

Applicant generation interconnection equipment must comply with SCE's Interconnection Handbook in regards to generation protection and lockable, visible open disconnecting means at the point of ownership in ownership.

Additionally, the applicant will be responsible for the installation and costs of certain underground facilities (i.e., ducts, structures, etc.) to the extent required by the final design. The construction of the underground facilities will be as per SCE's project drawings.

Facilities Study

A Facilities Study will be performed to conclusively determine the detailed scope and cost of facilities required to interconnect the [redacted]

V. NON-BINDING ORDER OF MAGNITUDE COST ESTIMATE

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

Distribution Upgrades

Distribution Line	$0.104 M

- Remote Automatic Recloser (RAR)

Interconnection Facilities

Electrical Distribution Facilities	$0.722 M

- 33 kV Circuit Extension
- Overhead Remote Controlled Switch (RCS)
- Overhead Switch
- Approximately 600 ft. of overhead line extension
- Metering CTs
- Metering VTs
- Meters
- Associated Wiring

Telemetry	$0.212 M

- Power System Controls (PSC)
- Telecom Facilities

Total non-binding order of magnitude cost estimate $1.038 M[4]

VI. PART A: SUMMARY

The Part A System Impact Study showed:

1. Distribution Upgrades will be required. The Distribution Upgrades installing a 33kV [redacted] the purpose of protection coordination on the SCE system.

2. Interconnection Facilities will be required to interconnect the new [redacted] These facilities include installing approximately 4000' of 33 kV 336 ACSR line extension from the existing Mc Coy 33kV line to th[redacted] site and the installation of a new overhead RCS switch, a new overhead pole switch, a 33kV overhead line extension of approximately 600' between the newly extended 33kV line and applicant's 33kV breaker, ground detector, pole-top metering CTs, meters, and associated wiring.

3. Real time telemetry will be required.

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

Interconnection Facilities/Automation $ 0.722 M

- 33 KV circuit extension
- Remote Controlled Switch
- Pole top metering

Telemetry Requirements $ 0.212 M
- Remote Terminal Unit
- Telecommunication System for RTU

Distribution Upgrades (33 kV circuit)

- New Remote Automated Re-Closer (RAR) $ 0.104 M

Total non-binding order of magnitude cost estimate $ 1.038 M[5]

5. Interconnection service and distribution service pursuant to the WDAT would be

[4] Cost estimates include 35% ITCC.
[5] Cost estimates include 35% ITCC.

expected to commence within 18 months of executing a Small Generator Interconnection Agreement ("SGIA") and associated Distribution Service Agreement.

6. Upgrades identified are general and preliminary descriptions only. The costs indicated are non-binding order of magnitude only. The schedule is projected and preliminary.

7. A Facilities Study detailing required scope, cost and schedule of the identified upgrades is required to proceed with the project. As part of the Facilities Study SCE will determine if a transducer is required to be installed at Blythe Substation to measure the reverse power flow as discussed in the Thermal Loading section above. The estimated scope and cost in this System Impact Study does not include the installation of such transducer.

8. This System Impact Study is based on various technical data previously provided by the applicant. If any of that information changes materially, as determined by SCE, the results of this Study may no longer be valid and may necessitate a new study.

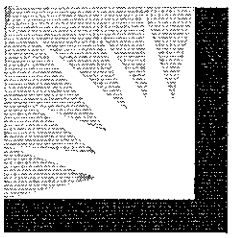
9. Current distribution standards are being updated to address generation interconnection systems. The proposed method of service on this report may change according on final design to comply with the updated distribution design standards.

ATTACHMENT B – BULK POWER SYSTEM IMPACT STUDY REPORT

[redacted]

GENERATION INTERCONNECTION TRANSMISSION ASSESSMENT SYSTEM IMPACT STUDY

November 10, 2011



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EXECUTIVE SUMMARY

On August 17, 2009, the Southern California Edison Company ("SCE") received an interconnection request from [redacted] for the interconnection of its [redacted] pursuant to the Small Generator Interconnection Procedures ("SGIP") under the Wholesale Distribution Access Tariff ("WDAT"). A scoping meeting was held on November 3rd, 2009. The [redacted] is a proposed 20 MW photovoltaic solar power generating facility in [redacted], with the project site located at the northeast corner of Butch Blvd. and Riverside Dr. adjacent to the [redacted] proposes to connect the [redacted] to the existing 34.5kV distribution line along Hobson Way served out of [redacted]. The initial requested in-service date for the project was [redacted].

In accordance with the SGIP, SCE performed an interconnection System Impact Study ("SIS" or "Study") to determine the adequacy of SCE's electrical system, including both the SCE distribution system and portion of SCE's electrical system that is part of the CAISO controlled grid and which may be impacted by the [redacted]. The Study was performed to determine if the system can accommodate the [redacted] under the following two system conditions: a 2013 heavy summer with a one-in-ten load forecast and a 2013 light spring load forecast (65% of the heavy summer load). These conditions reflect the most critical expected loading condition for the transmission system in SCE's area.

The Study included all queued generation projects in the study area ahead of the [redacted] regardless of the in-service dates of such prior projects. This includes several higher queued serial projects active in either the CAISO SGIP or the SCE WDAT SGIP. This also includes numerous generation projects seeking interconnection under the CAISO's and SCE's Large Generator Interconnection Procedures ("LGIP").

Results of the System Impact Study will be used as the basis to determine appropriate project cost allocation for facility upgrades in the Facilities Study. ***The Study accuracy and results for the assessment of the system adequacy are contingent on the accuracy of the technical data provided by*** [redacted] Any changes from the data provided could void the Study results. The Study report provides detailed Study assumptions and conditions of the system in which the Study was conducted.

Please be aware that a restudy may be required to reflect the system configuration if a higher queued generation or transmission project that was modeled in the System Impact Study withdraws or is modified in accordance with applicable tariff allowances.

[1] Date as requested in the application. Actual operating date depends on design, procurement, and construction requirements.

CONCLUSIONS

Based on the Study results, the existing SCE transmission facilities are not adequate to accommodate the [redacted] LL queued ahead generation projects.

Power Flow

Distribution Facilities

Results of the distribution analyses are included in the Part A of this SIS report.

CAISO Controlled Network Facilities

The power flow study focused on evaluating system performance on transformers and transmission lines under CAISO-control in SCE's Eastern Bulk System with the addition of the [redacted] The power flow study considered the following four scenarios:

TOT094 ISO Q#11A (520 MW) on, Metropolitan Water District Pump load on
TOT094 ISO Q#11A (520 MW) on, Metropolitan Water District Pump load off
TOT094 ISO Q#11A (520 MW) off, Metropolitan Water District Pump load on
TOT094 ISO Q#11A (520 MW) off, Metropolitan Water District Pump load off

These scenarios are based on expected set of system conditions. The System Impact Study evaluated the effects of the output of the [redacted] in these four scenarios under Light Spring and Heavy Summer load conditions.

The addition of the [redacted] does not trigger a base case overload on the critical transmission lines and transformer banks in the area. The project addition was found to increase loadings on the Julian Hinds – Mirage 220 kV Transmission Line (T/L). Under loss of either Devers – Red Bluff No.1 or No.2 500 kV T/L, the study identified that the existing SPS will sufficiently address any reliability concerns associated with loading on the Julian Hinds – Mirage 230 kV T/L. However, increased loadings that may result in increased SPS action would be addressed by the CAISO's implementation of appropriate congestion management protocols thereby addressing all impacts attributed to the addition of the [redacted]

Transient Stability

The Study identified that the addition of the [redacted] did not trigger any new transient instability problems.

Post-Transient Voltage

The Study identified that the addition of the [redacted] did not trigger any new post-transient voltage problems.

Short-Circuit Duty

Distribution Non-CAISO Facilities

Results of the distribution SCD analyses are included in the Part A of this SIS report.

Network CAISO Facilities

The results showed that the addition of the [redacted] does not increase SCD and contributes no SCD impact on the SCE transmission system.

Deliverability Assessment

BG is pursuing interconnection of its [redacted] under the SCE WDAT SGIP. In terms of deliverability status, all small generation projects (including those under the SCE WDAT SGIP) are considered as "Energy Only" projects by CAISO and therefore no deliverability assessment was performed as part of this System Impact Study. [redacted] has subsequently submitted a request for Full Capacity Deliverability status under the One-Time Full Capacity Deliverability option pursuant to SCE's revised Generator Interconnection Procedures (GIP). Under the One-Time Full Capacity Deliverability option, the [redacted] Full Capacity Deliverability Status will be assessed as part of Queue Cluster 4, which is estimated, at this time, to be completed in third quarter 2012.

Facilities Study

As part of the Facilities Study, no additional transmission work is required to be assessed.

CONTENTS

[redacted]

SYSTEM IMPACT STUDY
November 10, 2011

I. INTRODUCTION

On August 17, 2009, the Southern California Edison Company ("SCE") received an interconnection request from [redacted] for the interconnection of its Blythe Green One Project, pursuant to the Small Generator Interconnection Procedures ("SGIP") under the Wholesale Distribution Access Tariff ("WDAT"). A scoping meeting was held on November 3rd, 2009. The [redacted] is a proposed 20 MW photovoltaic solar power generating facility in [redacted] with the project site located at the northeast corner of [redacted]. [redacted] proposes to connect the [redacted] to the existing 34.5kV distribution line along Hobson Way served out o[redacted] The initial requested in-service date for the project was [redacted].

In accordance with the SGIP, SCE performed an interconnection System Impact Study ("SIS" or "Study") to determine the adequacy of SCE's electrical system, including both the SCE distribution system and portion of SCE's electrical system that is part of the CAISO controlled grid and which may be impacted by the [redacted] The Study was performed to determine if the system can accommodate the [redacted] under the following two system conditions: a 2013 heavy summer with a one-in-ten load forecast and a 2013 light spring load forecast (65% of the heavy summer load). These conditions reflect the most critical expected loading condition for the transmission system in SCE's area.

The Study included all queued generation projects in the study area ahead of the [redacted] regardless of the in-service dates of such prior projects. This includes several higher queued serial projects active in either the CAISO SGIP or the SCE WDAT SGIP. This also includes numerous generation projects seeking interconnection under the CAISO's and SCE's Large Generator Interconnection Procedures ("LGIP").

Results of the System Impact Study will be used as the basis to determine appropriate project cost allocation for facility upgrades in the Facilities Study. ***The Study accuracy and results for the assessment of the system adequacy are contingent on the accuracy of the technical data provided by*** [redacted] Any changes from the data provided could void the Study results. The Study report provides detailed Study assumptions and conditions of the system in which the Study was conducted.

[2] Date as requested in the application. Actual operating date depends on design, procurement, and construction requirements.

II. STUDY CONDITIONS AND ASSUMPTIONS

A. Planning Criteria

The Study was conducted by applying the CAISO Reliability Criteria. The main criteria applicable to this Study are as follows:

Power Flow Analysis

The following contingencies are considered for transmission and sub-transmission lines and 500/220 kV transformer banks ("AA-Banks"):

- Single Contingencies – Loss of one line or one AA-Bank and selected overlapping outages of one generation unit and one transmission line
- Double Contingencies – Loss of two lines or one line and one AA-Bank identified as common mode failure elements (Outages of two AA-Banks are beyond the Planning Criteria)

The following reliability criteria are used:

[redacted]	Base Case	Limiting Component Normal Rating
	N-1	Limiting Component A-Rating
	N-2	Limiting Component B-Rating
[redacted]	Base Case	Normal Loading Rating
	Long Term & Short Term	As defined by SCE Operating Bulletin

System upgrades for transmission lines are generally recommended for all reliability criteria violations. Special Protection Systems ("SPS") on the CAISO-controlled bulk power system may be allowed for single contingency and credible double contingencies reliability criteria violation in place of system upgrades, provided that the SPS complies with the CAISO Planning Standards' New Generator SPS Guidelines.

The following principles were used in determining whether congestion management, SPS, or facility upgrades are required to mitigate base case, single contingency, and/or double contingency overloads:

- Congestion management, as a means to mitigate base case overloads, can be used if it is determined to be manageable and the CAISO Operations concurs with the implementation. Congestion management to mitigate criteria violations may include curtailment of the proposed generation project in the CAISO's day-ahead and real time scheduling markets as needed in anticipation of the contingency.

- Facility upgrades will be required if it is determined that the use of congestion management for base case overloads is unmanageable.

- SPS on the CAISO-controlled bulk power system will be recommended for criteria violations under outage conditions if it effectively mitigates system problems, does not jeopardize system integrity, does not exceed the current CAISO single and double contingency tripping limitations, does not adversely impact existing or proposed SPS in the area, and conforms to existing CAISO SPS Guidelines.

- Facility upgrades will be required if the use of an SPS is determined to be ineffective, system integrity is jeopardized, the amount of generation tripping exceeds the current CAISO single and double contingency tripping limitations, adverse impacts are identified to existing or proposed SPS in the area, the SPS does not conform with the existing SPS Guidelines or the SPS cannot be effectively implemented.

The following study method was implemented to assess the extent of possible congestion:

a) Under Base Case with all transmission facilities in service, the system was evaluated with all existing interconnected generation and all generation requests in the area that have a queue position ahead of this request (pre-project). Included in the Study are CAISO-approved transmission projects queued ahead of the generation interconnection request.

b) Under Base Case with all transmission facilities in service, the system was reevaluated with the inclusion of the Project (post-project).

If the emergency loading limits of facilities are exceeded in (a), the overload is identified as an existing overload that was triggered by a project in queue ahead of the [redacted] If the emergency loading limits of facilities are exceeded in (b) and were not exceeded in (a), the overload is identified as triggered by the addition of the [redacted] The [redacted] and other market participants in the area may, as applicable, be subjected to congestion management, potential upgrade cost and/or participation of any proposed SPS if the project addition aggravates or triggers the overload. Additionally, the [redacted] may have to participate in mitigation of overloads triggered by subsequent projects in queue, subject to FERC protocols and policies.

Results of these studies should identify:

a) If the system is adequate to accommodate the proposed [redacted] and all projects ahead in queue without the need for congestion management, SPS, or facility upgrades;

b) If base case violations exist in the area without the [redacted] after the addition of all projects in queue ahead of th[redacted]

c) If base case violations are triggered in the area with the addition of the [redacted] after the addition of all projects in queue ahead of th[redacted]

The range of base case congestion for the [redacted] will be determined by reducing market generation in the area including the [redacted] For single

outage conditions, the same methodology will be used to identify how much generation tripping is required in order to determine if use of an SPS on the CAISO-controlled bulk power system is appropriate. Use of SPS will be deemed inappropriate if the total amount of generation reduction is found to exceed 1,150 MW under loss of one transmission element and 1,400 MW under loss of two transmission elements. These limits are established by the CAISO utilizing the current Spinning Reserve Criteria.

B. Generation and Load Assumptions

To simulate the SCE transmission system for analysis, the Study used databases that were developed to conduct SCE's Annual CAISO Controlled Facilities Expansion Program. The bulk power study considered two load conditions: 2013 heavy summer and a 2013 light spring case which assumed 65% of heavy summer load forecast.

In addition, the Study evaluated conditions with dispatch of generation inside and outside of the SCE service territory and electrical system in a manner that provided relatively high loadings in SCE's Eastern area. This included adjusting the imports on the East-of-River and West-of-River Paths and modeling all pertinent queued ahead generation projects in the vicinity of the Eastern Area. Generation assumptions for active LGIP Serial Projects and Transition Cluster ("TC") Projects in TC Phase 2 are provided below in Table 1 and Table 2 respectively. Heavy summer and light spring load study assumptions are provided below in Table 3 and Table 4 respectively.

Table 1
ACTIVE QUEUED AHEAD DEVERS/VALLEY GENERATION PROJECTS

C. [redacted]

The [redacted] is geographically located at the northeast corner of Butch Blvd. and Riverside Dr. adjacent t[redacted]n th[redacted] The [redacted] will consist of [redacted] 34.5/0.208 kV 500 kVA pad-mount transformers, [redacted] Satcon PowerGate Plus 500 kW inverters [redacted] photovoltaic panels, and meters and metering equipment at the Small Generating Facility site.

[redacted] proposes to interconnect the project by tapping an existing SCE 34.5 kV line running along Hobson Way. The nearest point of delivery from the requested point of interconnection to the CAISO Controlled Grid is the [redacted] 161/34.5 kV substation. [redacted] requested an operating date of July 1, 2011.

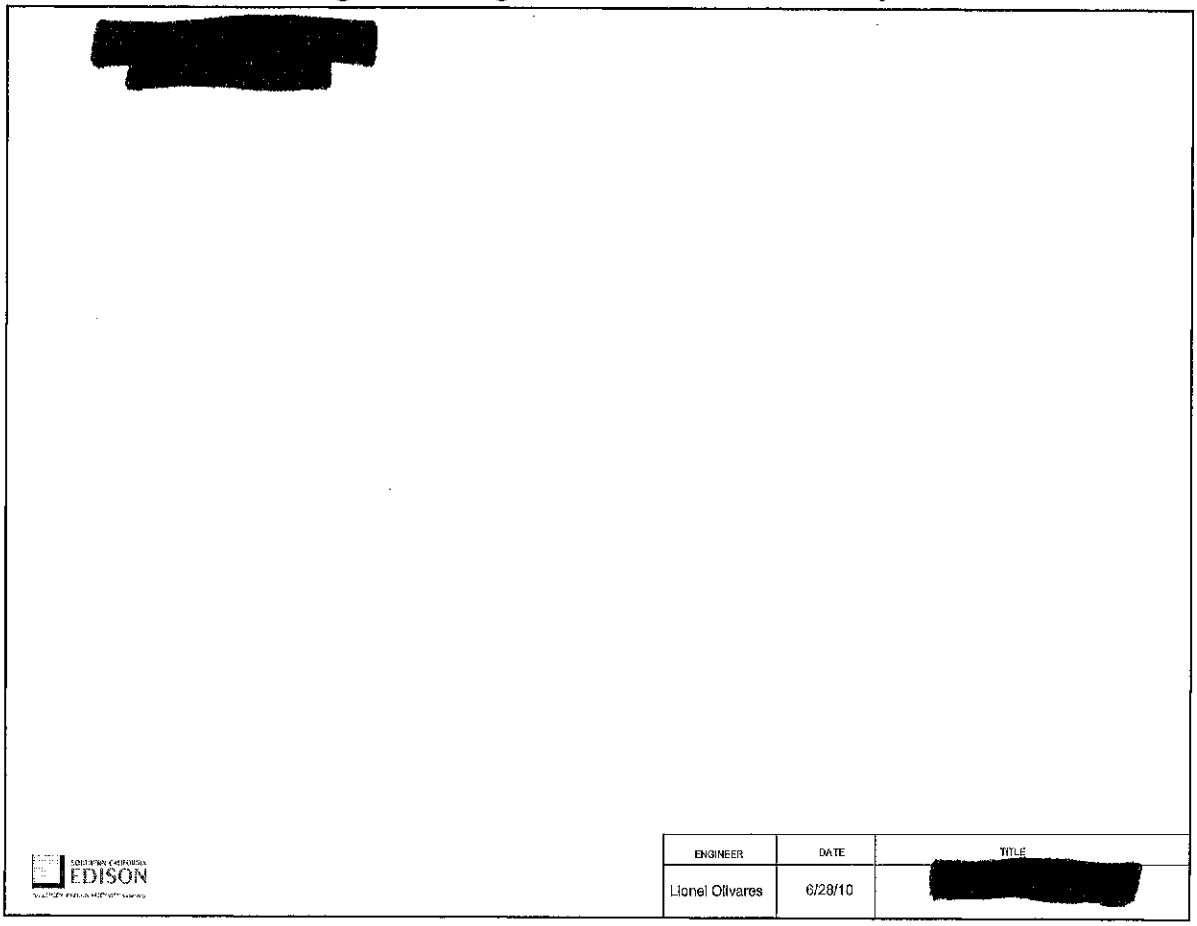
A geographic map illustrating the proposed project location is provided below in Figure 1 and a single line diagram illustrating the interconnection as modeled in this Study is provided in Figure 2.

Figure 1
[redacted] **Geographic Map**

Figure 2

[redacted]

Single Line Diagram as Modeled in this Study



The Project dynamic data used to represent the photovoltaic generator in the GE PSLF Dynamic Software are consistent with the use of the Satcon PowerGate inverter model. These inverters are typically integrated with an array of PV modules, step-up transformers and other balance-of-system components necessary to convert solar irradiance to grid-quality AC power for delivery at transmission or distribution voltage.

D. Transmission Upgrades to be Included in the Base Cases

The Study included the modeling of all CAISO-approved transmission projects in the Eastern Bulk System base cases. In addition, a number of transmission upgrades which are needed to support queued ahead serial generation projects in the Eastern Bulk System were modeled.

- West-of-Devers Upgrade Project (WOD Project)

There are [redacted] 220 kV lines on the west side of the Devers 220 kV Substation:

Devers – San Bernardino 220 kV line #1 and #2
Devers – Vista 220 kV line #1 and #2

Currently, these old lines do not have overloading capability. Therefore, the WOD Project was proposed to mitigate the identified overloads on the lines – Rebuild the lines with 2B-1590 kcmil ACSR conductors per phase supported on two sets of double-circuit tower structures.

- Devers – Mirage Split Project

SCE's Devers and Mirage 115 kV systems are operated in parallel with the local 220 kV systems. Such configuration caused peak time overloads on the 115 kV systems. Reconfiguring the Devers 115 kV and Mirage 115 kV systems to be operated radial from the 220 kV system will mitigate the identified overloads and increase local reliability to serve load.

- The Red Bluff 500/220 kV Substation

There are [redacted] solar projects in the Serial Group, totaling 550 MW, which proposed to interconnect in SCE/MWD's J. Hinds and Eagle Mountain area. This injection capacity would result in overloading MWD's 220kV system and would cause costly system upgrades and interruption of the MWD's pump services during the construction of the system upgrades.

Based on the mutual agreement among CAISO, SCE, and affected Interconnection Customers (the ICs), the Red Bluff Substation was proposed to interconnect these projects directly into SCE's existing Palo Verde – Devers 500 kV line (DPV1 Line) by loop-in the Red Bluff Substation 2 miles East of the CA series caps on the PVDV line.

- Devers – Colorado River 500kV line #2

Construct a new 125.4 miles 500kV line to transfer renewable energy/ new generation from the new collector Substation (Colorado River) to Devers Substation.

- West-of-Devers SPS (Temporary)
- [redacted]
- MWD Cross Tripping SPS

E. Existing Special Protection Systems

The existing system has several existing Special Protection Systems ("SPS") to address thermal overload and transient stability concerns. The relevant SPS that may be impacted by

the [redacted] is a flow based SPS without regard to a specific outage. As a result, loading on the monitored line may be increased resulting in a potential increase in SPS action with the addition of the project. However, the CAISO would implement appropriate congestion management protocols to mitigate any such potential increase in SPS action.

F. Power Flow Study

The [redacted] System Impact Study considered two power flow study scenarios. Each case was derived from CAISO Expansion Study base cases.

a). SCE System with a 2013 Heavy Summer load forecast and all serial generation projects in queue ahead of the [redacted] and associated upgrades if known, Case 1.

The Study considered heavy load conditions with generation patterns and Path 26 imports dispatched in a manner that would stress the SCE system in the area of interconnection of the [redacted] This was done in order to identify the extent of potential congestion. Generation included: Regulatory must-take, all existing generation in the Northern areas, and all other proposed generation projects in queue ahead of the [redacted]

b). SCE System with a 2013 Heavy Summer load forecast and all serial generation projects in queue ahead of the [redacted] and associated upgrades, if known, and the inclusion of the [redacted], Case 2.

Case 1 was modified to include the [redacted] modeled at the requested point of interconnection with a net generation of 20 MW.

c). SCE System with a 2013 Light Spring load forecast and all generation projects in queue ahead of the [redacted] and associated upgrades if known, Case 3.

The Study considered light load conditions with generation patterns and Path 26 imports dispatched in a manner that would stress the SCE system in the area of interconnection of the [redacted] This was done in order to identify the extent of potential congestion. Generation included: Regulatory must-take, all existing generation in the Northern areas, and all other proposed generation projects in queue ahead of the [redacted]

d). SCE System with a 2013 Light Spring load forecast and all generation projects in queue ahead of the [redacted] and associated upgrades, if known, and the inclusion of the [redacted] Case 4.

Case 3 was modified to include the [redacted] modeled at the requested point of interconnection with a net generation of 20 MW.

Additional Power Flow Study assumptions are summarized in Table 5 below.

Table 5
Power Flow Study Assumptions (MW)

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	19,422	19,441	12,954	12,973
	-7,138	-7,138	-3,445	-3,445
	26,450	26,450	16,359	16,359
	659	658	590	588

G. Short-Circuit Duty Study

To determine the impact on short-circuit duty, within SCE's electrical system, after inclusion of th[redacted] the Study calculated the maximum symmetrical three-phase-to-ground short-circuit duties. Generation and transformer data represented in the generator and transformer data sheets provided by the customer were utilized. Bus locations where short-circuit duty is increased with the propose[redacted] by at least 0.1 kA and the duty is in excess of 60% of the minimum breaker nameplate rating are flagged for further review. Upon completion of the detailed circuit breaker review, circuit breakers exposed to fault currents in excess of 100 percent of their interrupting capacities will need to be replaced or upgraded, whichever is appropriate. It should be noted that other WECC entities may request specific information within the WECC process to evaluate potential impact within their respective systems of this project addition.

At this time, numerous higher queued SGIP, TC and QC1 studies are still in progress or have not yet commenced. Until those studies are completed and upgrades for all higher queued projects are finalized, it is not possible to model all higher queued projects and their corresponding upgrades for short circuit duty purposes in a timely manner for purposes of this SIS.

In order to provide as much useful information as possible to [redacted] a limited Short Circuit Duty analysis was performed. This analysis used the best short circuit duty case available at this time which includes the latest information available to date regarding all active TC Phase 2 projects, all active QC1 Phase 1 projects, and the limited number of higher queued SGIP projects in the area with studies already completed.

H. Deliverability Assessment

The [redacted] is pursuing interconnection under the SCE WDAT SGIP. In terms of deliverability status, all small generation projects (including those under the SCE WDAT SGIP) are considered as "Energy Only" projects by CAISO and therefore no deliverability assessment is performed as part of this System Impact Study. [redacted] has subsequently submitted a request for Full Capacity Deliverability status under the One-Time Full Capacity Deliverability option pursuant to SCE's revised Generator Interconnection Procedures (GIP). Under the One-Time Full Capacity Deliverability option, th[redacted]

[redacted] Capacity Deliverability Status will be assessed as part of Queue Cluster 4, which is estimated, at this time, to be completed in third quarter 2012.

III. GENERATOR ELECTRIC GRID FAULT RIDE-THROUGH CAPABILITY CRITERIA AND POWER FACTOR CRITERIA

WECC has adopted a Generator Electrical Grid Fault Ride-Through Capability Criteria. CAISO and SCE currently support a Low Voltage Ride-Through Criteria to ensure continued reliable service. The Criteria is summarized as follows:

1. Generator is to remain in-service during system faults (three phase faults with normal clearing and single-line-to-ground with delayed clearing) unless clearing the fault effectively disconnects the generator from the system.

2. During the transient period, generator is required to remain in-service for the low voltage and frequency excursions specified in WECC Table W-1 (provided below) as applied to load bus constraint. These performance criteria are applied to the generator interconnection point, not the generator terminals.

3. Generators may be tripped after the fault period if this action is intended as part of a SPS.

4. This Standard will not apply to individual units or to a site where the sum of the installed capabilities of all machines is less than 10MVA, unless it can be proven that reliability concerns exist.

5. The performance criteria of this Standard may be satisfied with performance of the generators or by installing equipment to satisfy the performance criteria.

6. The performance criterion of this Standard applies to any generation independent of the interconnected voltage level.

7. No exemption from this Standard will be given because of minor impact to the interconnected system.

8. Existing generators that go through any refurbishments or any replacements are then required to meet this Standard.

IV. STUDY RESULTS

A. Power Flow Study Results

The power flow study focused on identifying system thermal overload problems on transformers and transmission lines in the CAISO-controlled transmission system with the addition of the [redacted] The power flow study also focused on these four scenarios:

[redacted] Metropolitan Water District Pump load on
Metropolitan Water District Pump load off
Metropolitan Water District Pump load on
Metropolitan Water District Pump load off

These scenarios are based on credible system situations. The System Impact Study evaluates the effects of the output of the [redacted] during these [redacted] scenarios under Light Spring and Heavy Summer load conditions. The addition of the [redacted] Project does not trigger base case overloads on the critical T/L's and transformers in the area. However, the addition of the [redacted] increases flows on the 161 kV line towards Eagle Mountain resulting in an increase flow from Eagle Mountain to Julian Hinds (or a flow reduction from Julian Hinds to Eagle Mountain) which in turn increases flows on the Julian Hinds – Mirage 230 kV T/L. Under loss of either Devers – Red Bluff No.1 or No.2 500 kV T/L, the existing SPS will sufficiently address any reliability concerns associated with loading on the Julian Hinds – Mirage 230 kV T/L. Line loadings on the Julian Hinds-Mirage 230 kV T/L, with and without the [redacted], are summarized in Table 6 below. However, such increase loading would be addressed by the CAISO's implementation of appropriate congestion management protocols thereby addressing all impacts attributed to the addition of the [redacted]

Table 6
Line Overloads with [redacted] – Heavy Summer with TOT094 ISO Q#11A On and MWD Pumps Off

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	896 Amp (N) 896 Amp (E)	894	**899**	[redacted]
[redacted]	896 Amp (N) 896 Amp (E)	894	**899**	[redacted]

Note: N = normal and E = emergency. **Bold** stands for loading in excess of line capability.

B. Short Circuit Duty Study

D.1. Electrical Characteristics of the [redacted]

A preliminary short-circuit duty analysis was performed for the [redacted] Blythe Green has identified that the [redacted] will be using [redacted] Satcon Power Gate Plus 500 kW inverters. The contribution of the [redacted] was modeled based on technical data provided by the customer and assuming that the [redacted] will meet grid-level Low Voltage Ride-Through ("LVRT") requirements.

D.2. Preliminary Short Circuit Duty Study Results

In order to provide as much useful information as possible to [redacted] a limited Short Circuit Duty analysis was performed in this transmission assessment. This analysis used the best short circuit duty case available at this time which includes the latest information available to date regarding all active queued ahead projects. This limited analysis showed that the addition of the [redacted] did not significantly impact SCD on the SCE system.

V. ESTIMATED PROJECT SCOPE AND COST

The [redacted] is interconnecting to the SCE distribution system. No transmission level interconnection facilities are required. Consequently, project scope and costs are provided in Part A of this SIS.

VI. CONCLUSIONS

Power Flow

The power flow study focused on identifying system thermal overload problems on transformers and transmission lines in the CAISO-controlled transmission system with the addition of the Blythe Green One Project. The power flow study also focused on these four scenarios:

[redacted]on, Metropolitan Water District Pump load on
[redacted]on, Metropolitan Water District Pump load off
[redacted]off, Metropolitan Water District Pump load on
[redacted]off, Metropolitan Water District Pump load off

These scenarios are based on credible system situations. The System Impact Study evaluates the effects of the output of the [redacted] during these four scenarios under Light Spring and Heavy Summer load conditions.

The addition of the [redacted] does not trigger base case overloads on the critical T/L's and transformer banks in the area. The project addition was found to increase loading on the Julian Hinds – Mirage 230 kV T/L. Under loss of either Devers – Red Bluff No.1 or No.2

500 kV T/L, the study identified that the existing SPS will sufficiently address any reliability concerns associated with loading on the Julian Hinds – Mirage 230 kV T/L. However, increased loadings that may result in increased SPS action would be addressed by the CAISO's implementation of appropriate congestion management protocols thereby addressing all impacts attributed to the addition of the [redacted]

Transient Stability

The Study identified that the addition of the [redacted] did not trigger any new transient instability problems.

Post-Transient Voltage

The Study identified that the addition of the [redacted] did not trigger any new post-transient voltage problems.

Short-Circuit Duty

Distribution Non-CAISO Facilities

Results of the distribution SCD analyses are included in the Part A of this SIS report.

Network CAISO Facilities

The results showed that the addition of the [redacted] does not increase SCD and contributes no SCD impact on the SCE transmission system.

Deliverability Assessment

The [redacted] is pursuing interconnection under the SCE WDAT SGIP. In terms of deliverability status, all small generation projects (including those under the SCE WDAT SGIP) are considered as "Energy Only" projects by CAISO and therefore no deliverability assessment is performed as part of this System Impact Study. [redacted] has subsequently submitted a request for Full Capacity Deliverability status under the One-Time Full Capacity Deliverability option pursuant to SCE's revised Generator Interconnection Procedures (GIP). Under the One-Time Full Capacity Deliverability option, the [redacted] Full Capacity Deliverability Status will be assessed as part of Queue Cluster 4, and is estimated, at this time, to be completed in third quarter 2012.

Facilities Study

As part of the Facilities Study, no additional transmission work is required to be assessed.

VII. CAVEATS AND RESPONSIBILITIES

A. Conceptual Plan of Service

The results provided in this Study are based on conceptual engineering and a preliminary plan of service and are not sufficient for permitting of facilities. The Plan of Service is subject to change as part of the ongoing Interconnection Study process.

B. Customer's Technical Data

Additional technical data related to the Interconnection Customer's project may be required as part of the ongoing Interconnection Study process. The Study accuracy and results for the Study are contingent upon the accuracy of the technical data provided by the Interconnection Customer. Any changes from the data provided could void the Study results.

C. Study Impacts on Neighboring Utilities

Results or consequences of this Study and/or to-be-performed Studies (System Impact and Facilities Study) may require additional studies, facility additions, and/or operating procedures to address impacts to neighboring utilities and/or regional forums. For example, impacts may include but are not limited to WECC Path Ratings, short circuit duties outside of the CAISO Controlled Grid, and sub-synchronous resonance (SSR).

D. Use of SCE Facilities

The Interconnection Customer is responsible for acquiring all property rights necessary for the Interconnection Customer's Interconnection Facilities, including those required to cross SCE facilities and property. This Interconnection Study does not include the method or estimated cost to the Interconnection Customer of SCE mitigation measures that may be required to accommodate any proposed crossing of SCE facilities with Interconnection Customer's Interconnection Facilities. The use of SCE property rights shall only be permitted upon written agreement between SCE and the Interconnection Customer. Any proposed use of SCE property rights may require a separate study and/or evaluation, at the Interconnection Customer's expense, to determine whether such use may be accommodated.

E. SCE Interconnection Handbook

The Interconnection Customer shall be required to adhere to all applicable requirements in the SCE Interconnection Handbook. These include, but are not limited to, all applicable protection, voltage regulation, VAR correction, harmonics, switching and tagging, and metering requirements.

F. Western Electricity Coordinating Council (WECC) Policies

The Interconnection Customer shall be required to adhere to all applicable WECC policies including, but not limited to, the WECC Generating Unit Model Validation Policy.

G. System Protection Coordination

Adequate Protection coordination will be required between SCE-owned protection and Interconnection Customer-owned protection. If adequate protection coordination cannot be achieved, then modifications to the Interconnection Customer-owned facilities (i.e., Generation-tie or Substation modifications) may be required to allow for ample protection coordination.