Appendix A – WDT433

[redacted]

Final Report

August 25, 2011

This study has been completed in coordination with Southern California Edison Generator Interconnection Procedures for Interconnection Requests in a Queue Cluster Window

Table of Contents

Attachments:

1. Generator Machine Dynamic Data
2. Dynamic Stability Plots (see Appendix F of the Group Report)
3. SCE Interconnection Handbook
4. Short Circuit Calculation Study Results (see Appendix H of the Group Report)
5. Deliverability Assessment Results
6. Allocation of Network Upgrades for Cost Estimates

1. Executive Summary

The Southern California Edison Company ("SCE") received an interconnection request fro[redacted]), for the interconnection of its [redacted] pursuant to the Cluster Large Generator Interconnection Procedures ("CLGIP") under the SCE Wholesale Distribution Access Tariff ("WDAT"). The Project is composed of photovoltaic modules with an output of 40 MW to the requested Point of Interconnection (POI) on Southern California Edison Company's (SCE) Vestal-Kern River 3 – 66kV line. The Interconnection Customer's requested Full Capacity deliverability status with an In-Service date of May 15, 2012 and Commercial Operation Date of June 15, 2012 for the Project.

In accordance with Federal Energy Regulatory Commission (FERC) approved Generator Interconnection Procedures (GIP) for Interconnection Requests in a Queue Cluster Window (CAISO Appendix Y), including Appendix 8 of the GIP ("Transition of Existing SGIP Interconnection Requests to the GIP"), the Project was grouped with th[redacted] an[redacted] Phase II Study (Phase II) projects to determine the impacts of the group as well as impacts of the Project on the CAISO Controlled Grid.

The group report has been prepared separately identifying the combined impacts of all projects in the group on the CAISO Controlled Grid. This report focuses only on the impacts of this Project.

The report provides the following:

1. Transmission and Distribution system impacts caused by the Project;
2. System reinforcements necessary to mitigate the adverse impacts caused by the Project under various system conditions and;
3. A list of required facilities and a non-binding, good faith estimate of the Project's cost responsibility and time to construct these facilities.

The Phase II study has determined that the Project contributes to various reliability and/or deliverability problems for which mitigation plans have been proposed. These mitigation plans are detailed in Section 10 of this report.

The non-binding SCE cost estimate of Interconnection Facilities[1] to interconnect the Project is approximately **$451,000** including ITCC[2]. The maximum cost responsibility for the SCE Network Upgrades[3] to interconnect the Project is **$11,000** and the cost of the Distribution Upgrades[4] is **$14,491,000.**

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[1] The transmission facilities necessary to physically and electrically interconnect the Project to the CAISO Controlled Grid at the point of interconnection.

[2] Income Tax Component of Contribution

[3] The SCE transmission facilities, other than Interconnection Facilities, beyond the point of interconnection necessary to physically and electrically interconnect the Project safely and reliably to the CAISO Controlled Grid

[4] These upgrades are not reimbursable.

The non-binding construction schedule to engineer and construct the facilities is approximately 60 months from the signing of the Generator Interconnection Agreement (GIA).

2. Project and Interconnection Information

Table 2-1 provides general information about the Project.

Table 2-1: [redacted]

Project Location	[redacted]
SCE Planning Area	[redacted]
Number and Type of Generators	[redacted]
Interconnection Voltage	[redacted]
Maximum Generator Output	[redacted]
Generator Auxiliary Load	[redacted]
Maximum Net Output to Grid	[redacted]
Power Factor Range	[redacted]
Step-up Transformer	[redacted]
Point of Interconnection	[redacted]
Commercial Operation Date	[redacted]

Figure 2-1 shows the conceptual single line diagram of the Project.

Figure 1-1: Proposed Single Line Diagram

3. Study Assumptions

For detailed assumptions, please refer to the Group Report. The following assumptions are only specific to the [redacted]

The following Facilities will be installed by SCE and are included in this Phase II Study:

- The required Retail Meters to meter the generating facility retail load.

  NOTE: SCE installation <u>does not</u> include metering voltage and current transformers. The SCE meters will be connected to the generator – owned voltage and current transformers to be installed for their CAISO metering.
- The required Remote Terminal Unit (RTU) to be installed at the generating facility which will be installed by SCE.

The following facilities are to be installed by the Interconnection Customer and are not included in this Phase II Study:

- The tapped substation
- The generation tie line on their property from their facilities to the tapped substation
- The 66 kV generation tie line with fiber optic cable from the generating facility to the last structure outside the WDT433 Substation property line.
- The required CAISO metering equipment (voltage and current transformers and CAISO meters).

  NOTE: The metering voltage and current transformers installed for the CAISO metering will also be used for the SCE owned retail meters.

4. Power Flow Analysis

The group study indicated that the Phase II projects contribute to the following transmission facility overloads or non-convergence problems. The details of the analysis and overload levels are provided in the group study.

4.1 Overloaded Transmission Facilities

The group study indicated that the Phase II projects contribute to the following transmission facility overloads or non-convergence problems. The details of the analysis and overload levels are provided in the group study.

Category "A"

- None

Category "B"

- None

Category "C"

- None

4.2 Overloaded Sub Transmission Facilities

This Project contributed to the following overloads:

Category "A"

[redacted]

Category "B"

- None

Category "C"

- None

4.3 Power Flow Non-Convergence

The project contributed to the non-convergence issues under the following contingencies:

Category "C"

- [redacted]

4.4 Recommended Mitigations

A combination of congestion management, the Project providing 0.95 leading/lagging power factor regulation capability at the POI, and SPS to trip the Project under identified contingency outage conditions is required to mitigate the power flow impacts of the Project described above. See the group report for additional details.

The scope of the mitigations assigned to the Project are as follows:
(Refer to Section 11 for a brief description of the upgrades)

Power Factor Regulation Requirement

- The project is required to provide 0.95 leading/lagging power factor regulation at the POI

Reliability Network Upgrades

- Short-Circuit Duty (SCD) Mitigations

Delivery Network Upgrades

- None

Distribution Upgrades

- Upgrades associated with the tap of the Vestal – Kern River 3 66 kV line
- Reconductor 2.32 miles of Vestal – Kern River 3 66 kV line

5. Short Circuit Analysis

Short circuit studies were performed to determine the fault duty impact of adding the Phase II projects to the transmission system and to ensure system coordination. The fault duties were calculated with and without the projects to identify any equipment overstress conditions. Once overstressed circuit breakers are identified, the fault current contribution from each individual project in Phase II is determined. Each project in Phase II will be responsible for its share of the upgrade cost based on the rules set forth in CAISO Tariff Appendix Y.

5.1 Short Circuit Study Input Data

The following input data provided by the Applicant of the Project was used in this study:

<u>Short Circuit Data @ 38 MVA Base:</u>

- Positive Sequence subtransient reactance (X"1) = 2.439 p.u.
- Negative Sequence subtransient reactance (X"2) = 2.439 p.u.
- Zero Sequence subtransient reactance (X"0) = 2.439 p.u.

<u>Station Step-up Transformers (total of one)</u>

- [redacted]phase transformer rated for 21.6kV/66kV 30 MVA with 9% impedance on a 30 MVA base.
- [redacted] phase transformers rated for 0.200kV/21.6kV 1 MVA with 5.75% impedance on a 1 MVA base.

5.2 Results

All bus locations where the Phase II projects increase the short-circuit duty by 0.1 kA or more and where duty is in excess of 60% of the minimum breaker nameplate rating are listed in the Group Report Appendix H. These values have been used to determine if any equipment is overstressed as a result of the Phase II interconnections and corresponding network upgrades, if any.

The responsibility to finance short circuit related Reliability Network Upgrades identified through a Group Study shall be assigned to all Interconnection Requests in that Group Study pro rata on the basis of short circuit duty contribution of each Generating Facility. In addition, the SCD impact of the associated proposed Network Upgrades was allocated to each Generating Facility using the same percentage assigned for the triggered Network Upgrade.

As discussed in the Group Report, the Phase II breaker evaluation identified overstressed circuit breakers at the following buses. The pro-rata cost allocation for this project, based on SCD contribution at each location, is also provided:

- Upgrade [redacted] circuit breakers at Vincent Substation
- Upgrade [redacted] circuit breakers at Lugo Substation
- Split the 66 kV bus at Windhub Substation

Table 5.1 SCD Allocation

Project Name	Vincent		Lugo		Windhub (Reliability)		Total (x1,000)
	% Allocated	Cost (x1,000)	% Allocated	Cost (x1,000)	% Allocated	Cost (x1,000)	
WDT433	0.1	$ 11	0	$ -	0	$ -	$ 11

5.3 Preliminary Protection Requirements

Protection requirements are designed and intended to protect SCE's system only. The preliminary protection requirements were based upon the interconnection plan as shown in Figure 2-1.

The applicant is responsible for the protection of its own system and equipment and must meet the requirements in the SCE Interconnection Handbook provided in Attachment 3.

6. Reactive Power Deficiency Analysis

In th[redacted] the studies for the CAISO Transition Cluster projects have concluded that such interconnection projects will be required to provide 0.95 leading/lagging power factor correction at the POI due to system area export constraints.

This Phase II Study identified multiple non-convergence problems caused by reactive deficiency. In order to maintain the system area export capability and minimize the SPS requirement under identified contingency conditions, the [redacted] Phase II projects are required to provide 0.95 leading/lagging power factor correction at the POI.

7. Transient Stability and Post-Transient Evaluations

Transient stability studies were conducted using full loop base cases to ensure that the transmission system remains in operating equilibrium, as well as operating in a coordinated fashion, through abnormal operating conditions after the Phase II projects begin operation. The generator dynamic data used in the study for the Project is shown in Attachment 1.

7.1 Transient Stability Study Scenarios

- Disturbance simulations were performed for a study period of 10 seconds to determine whether the Phase II projects will create any system instability during a variety of line and generator outages. The most critical single contingency and double contingency outage conditions in the [redacted] were evaluated. For the list of specific line and generator outages evaluated, see the group report.

7.2 Results

Stability analysis was performed for the [redacted] to identify "relative" as opposed to "absolute" conclusions regarding the stability impacts of this Phase II queued generation project. With all proposed system upgrades listed above and in Section 4.3, the Phase II Projects in SCE's [redacted] would not cause the transmission system to go unstable under Category B and Category C outages. Stability plots are shown in Appendix F of the Group Report.

8. Deliverability Assessment

There were no Delivery Upgrades identified.

9. Operational Studies

9.1 IC Proposed Project Timelines

The latest information provided by the IC states that the requested generator In-Service date is May 1, 2012.

9.2 System Upgrades Required for Energy Only Interconnection

The Operational Studies identified that the following facilities are required in order to provide for Energy Only interconnection:

9.2.1 PTO's Interconnection Facilities

See Section 11

9.2.2 Plan of Service Reliability Network Upgrades

See Section 11

9.2.3 Reliability Network Upgrades

9.2.3.1 Special Protection System (SPS)

None

9.2.3.2 Short-Circuit Duty (SCD) Mitigation

The circuit breaker upgrades that were triggered by queued-ahead projects are identified in Section 4.6 of the group report. The Operational Study undertaken as part of this Phase II Study identified the required timing for circuit breaker upgrades triggered by queued-ahead generation projects. Timing for breaker upgrades at each of the substations identified as queued ahead is shown below in Table 9.2.1:

PAGES OMITTED FOR
CEII REGULATIONS

9.2.4 Distribution Upgrades

See Section 11

9.2.5 Other Energy Only Operational Issues

None

9.3 System Upgrades Required for Full Capacity Service

In order to provide for Full Capacity service, the following facilities are required:

9.3.1 Triggered Deliverability Upgrades

None

9.3.2 Previously Triggered Deliverability Upgrades

To enable Full Deliverability of this project, the entire Tehachapi Renewable Transmission Project (TRTP) will need to be placed into service.

9.4 Conclusion

The requested generator In-Service date of May1, 2012 cannot be met due to anticipated duration of facilities needed for Energy Only interconnection. The in-service date is mostly impacted by the timing of the factilities needed for Energy Only Interconnection as identified in this Phase II Study. Based on this study, the in-service date identified is 2017. In addition, if the interconnection facilities can be accelearted to be completed prior to completion of TRTP, the project will not achieve the requested Full Delivery status until such time that TRTP is completed.

10. Environmental Evaluation/Permitting

Please see Section 12 of group report.

11. Upgrades, Cost Estimates and Construction schedule estimates

To determine the cost responsibility of each generation project in Phase II, the CAISO developed cost allocation factors based on the individual contribution of each project (Attachment 6). The cost allocation for the Interconnection Facilities and Network Upgrades for which the Project is solely responsible is as follows:

PTO's INTERCONNECTION FACILITIES

Per the Phase I addendum issued in January 2011, the IC has elected to self-build the required 66 kV substation and the entire length of the 66 kV gen tie line from the substation to the IC's site location.

A. Substation

WDT433 Substation

Review the complete engineering and design drawings and bill-of-materials submitted by the IC to verify their compliance with the SCE engineering and design standards.

Inspect the site during construction to verify compliance with SCE Materials and Construction Standards.

Test the substation prior to energizing.

B. Telecommunications

Install circuit cross-connections supporting the SCADA (RTU) at the generation facility.

C. Metering Services Organization

Install revenue metering cabinet for the SCE revenue meters required to meter the retail load at the generating facility. The SCE meter will be installed in tandem with the ISO meter circuit.

The customer will provide the required metering equipment (voltage and current transformers and meter enclosure).

D. Power System Control

Install one RTU at the generating facility and at WDT433 Substation to monitor typical elements such as MW, MVAR, terminal voltage, and circuit breaker status at each generating unit and the plant auxiliary load and to transmit this information to the SCE grid control center.

E. Real Properties, Transmission Projects Licensing, and Corporate Environmental Health & Safety Organization

Obtain easements and / or acquire land, obtain licensing and permits and perform all required environmental activities for the installation of the following project elements if applicable:

- Segment of 66 kV generation tie line within the WDT433 Substation property.
- Telecommunication requirements

PLAN OF SERVICE NETWORK UPGRADES

No Plan of Service Network upgrades were allocated the Project.

RELIABILITY NETWORK UPGRADE

Short Circuit Duty (SCD) Mitigation

Upgrade transmission network circuit breakers (pro-rata share of upgrade based on project contribution to SCD at each location).

[redacted]

See the Group Report for additional details

DELIVERY NETWORK UPGRADES

No Delivery Network upgrades were allocated to the Project.

DISTRIBUTION UPGRADES

A. Sub-Transmission

WDT433 Tap Line

Install approximately 700 circuit feet of conductor, three engineered, bolted footing steel poles, three light weight steel poles, and three automated pole switches.

B. Substation

Kern River 3 Substation

- [redacted] with digital communications channel
- [redacted] with digital communications channel
- [redacted] potential transformers

Vestal Substation

- [redacted] with digital communications channel
- [redacted] with digital communications channel
- [redacted] potential transformers

Inspect the site during construction to verify compliance with SCE Materials and Construction Standards.

C. Telecommunications

Install diverse fiber optic cables between SCE's WDT433 and Vestal Substations as follows:

- 10,050' of 48/SMF
- 10,220' of 48/SMF

Also, install all the required light-wave, channel, and associated equipment at SCE's WDT433 and Vestal Substations and channel and associated equipment at Kern River 3 Power House which support 66 kV line protection and SCADA.

D. Real Properties, Transmission Projects Licensing, and Corporate Environmental Health & Safety Organization

Obtain easements and / or acquire land, obtain licensing and permits and perform all required environmental activities for the installation of the following project elements if applicable:

- Over Site for SCE's WDT433 Substation
- Diverse telecommunications paths

Re-Conductor 2.32 miles on the Vestal – Kern River 3 66 kV line:

Sub-Transmission:
Re-conductor approximately 2.32 miles from 2/0 cu to 954 SAC between the proposed WDT433 tap and Vestal Substation. Replace [redacted] existing wood poles and re-insulate a total of 48 poles.

Corporate Environmental Health and Safety, Licensing, and Real Properties
Perform all required activities to support the 66 kV line re-conductoring.

Table 11.1: Upgrades, Estimated Costs, and Estimated Time to Construct Summary

Each Upgrade category may contain multiple scope durations. The longest duration is shown under the Estimated Time to Construct.

Type of Upgrade	Upgrade (May include the following)	Description	Estimated Cost x 1000	Estimated Cost x 1,000 Constant Dollar (OD Year) *(Note 4)*	Estimated Time to Construct *(Note 3)*
PTO's Interconnection Facilities *(Note 1)*	See Section 11 - PTO'S Interconnection Facilities	Non-network facilities needed to enable interconnection	$451	$493 (2014)	24 Months
Plan of Service Reliability Network Upgrades	See Section 11 – Plan of Service Reliability Network Upgrades	Direct Assigned Network upgrades needed to enable interconnection.	N/A	$0	
Reliability Network Upgrades	See Section 11 - Reliability Network Upgrades in the Northern Group Report	SCD Mitigation Allocated to maintain system Reliability	$11	$12 (2014)	24 Months
Delivery Network Upgrades	None	Network upgrades needed to support Full Delivery, if requested	N/A	$0	
Distribution Upgrades *(Note 2)*	See Section 11 – Distribution Upgrades	Non-CAISO SCE Distribution Facilities	$14,491	$17,168 (2017)	60 Months
Total			**$14,953**		**60 Months**

Note 1: The Interconnection Customer is obligated to fund these upgrades and will not be reimbursed.

Note 2: These upgrades are not identified in ISO tariff, and are not reimbursable. Allocated costs may change if all projects responsible for these upgrades do not execute LGIAs.

Note 3: The estimated time to construct (ETC) is for a typical project; schedules duration may change due to number of projects approved and release dates. Stacked projects impact resources, system outage availability, and environmental windows of construction. Assumption is SCE will need to obtain CPUC licensing and regulatory approvals prior to design, procurement and construction of the proposed facilities required to serve the interconnection customer and prerequisite facilities are in service.

Note 4: SCE's Phase II cost estimating is done in 'constant' dollars 2011 and then escalated to the estimated O.D.year. For the Phase II study, the estimated O.D. is derived by assuming the duration of the work element will begin approximately in January 2012, which is roughly the CAISO tariff scheduled completion date of the Phase II study plus 90 days for the LGIA signing period. For instance, if a work element is estimated to take a total of 24 months (permitting, design, procurement, and construction), then the estimated O.D. would be January 2014. If an IC's requested O.D.(in- service) is beyond the estimated O.D. of a work element, the IC's requested O.D. is used.

WDT 433 [redacted]

Cost Estimate Summary (2011 Dollars)

Scope: Interconnect 40MW of Generation by tapping the Vestal - Kern River #3 66kV Line

No.	ELEMENT	INTERCONNECTION FACILITIES (Subject to ITCC)***	ITCC ** (35%	TOTAL	TOTAL CONSTANT $ (ESTIMATED YEAR O.D.)****
					2014
	SUB-TRANSMISSION				
1	Tap Line to Vestal - Kern River 3 66kV Line	$ -	$ -	$ -	
	SUBSTATION				
2	Add relays to Kern River 3 and Vestal substation	$ -	$ -	$ -	
2a	Oversite testing cost for customer 66kV substation	$ 133,000	$ 47,010	$ 180,000	
	POWER SYSTEM CONTROL				
3	RTU at Generation Facility	$ 93,000	$ 33,090	$ 126,000	
4	RTU at tap substation	$ -	$ -	$ -	
5	Name Plate & additional points added at Kern River3 & Vestal Substations	$ -	$ -	$ -	
	CORPORATE ENVIRONMENTAL HEALTH AND SAFETY				
6	CEH & S related to tap the existing Vestal-Kern River No. 3 66kV line into the new customer-built substation.	$ -	$ -	$ -	
7	CEH & S related to install primary telecom lines between WDT433 Substation and Vestal Substation	$ -	$ -	$ -	
8	CEH & S related to secondary install telecom line b/t WDT433 substation and Vestal substation	$ -	$ -	$ -	
9	CEH&S for new customer built 66kV WDT433 substation		$ -	$ -	
	TELECOM				
10	Install circuit cross-connections supporting SCADA	$ 13,000	$ 6,030	$ 18,000	
11	Install FO cable, lightwave channel and associated equipment supporting SCADA	$ -	$ -	$ -	
12	ECS - install 10,050' of 48SMF FO cable, primary route	$ -	$ -	$ -	
13	ECS - Install 10,220' OF 48SMF F.O. CABLE, secondary route	$ -	$ -	$ -	
	LICENSING				
14	Licensing to support project - Not required	$ -	$ -	$ -	
	REAL PROPERTIES				
15	Activities related to support project	$ 65,000	$ 23,010	$ 88,000	
	METERING SERVICES				
16	Retail Meter at Generation Facility	$ 29,000	$ 10,010	$ 39,000	
	Totals	$ 333,000	$ 118,010	$ 451,000	$ 493,000

* Pursuant to FERC Order 2003A, ITCC is not collected on Reliability Upgrades and One Time Costs.

** ITCC cost may be satisfied with a letter of credit in accordance with the tax provisions of the LGIA.

*** The ITCC included in this cost estimate was computed using a 35% rate. Because of recent enactment of H.R. 4853, the Tax Relief, Unemployment Insurance Reauthorization and Job Creation Act of 2010, and upon formal acceptance by the CPUC of SCE's advice letter (filed on December 27, 2010), this rate may change for electric CIAC recorded or received after September 8, 2010 through December 31, 2011.

Cost estimate is only an estimate based on 2011 constant dollars and actual cost is subject to change depending on project construction date, and inflation.

**** SCE's Phase II cost estimating is done in 'constant' dollars 2011 and then escalated to the estimated O.D. year. For the Phase II study, the estimated O.D. is derived by assuming the duration of the work element will begin approximately in January 2012, which is roughly the CAISO tariff scheduled completion date of the Phase II study plus 90 days for the LGIA signing period. For instance, if a work element is estimated to take a total of 24 months (permitting, design, procurement, and construction), then the estimated O.D. would be January 2014. If an IC's requested O.D. (in-service) is beyond the estimated O.D. of a work element, the IC's requested O.D. is used.

This document includes confidential trade secrets and proprietary information of Southern California Edison, to be used only by the Interconnection Customer in connection with the evaluation of this Facility Study Process. Southern California Edison [illegible]

12. Items not covered in this study

11.1 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 Phase II Interconnection Study.

11.2 Customer's Technical Data

Additional technical data related to the Project may be required as part of the Phase II Study. The study accuracy and results for the Phase I 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.

11.3 Study Impacts on Neighboring Utilities

Results or consequences of this Phase I Study and/or to-be-performed Phase II Interconnection 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).

11.4 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 at SCE's sole determination. 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.

11.5 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.

11.6 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.

11.7 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

11.8 Standby Power and Temporary Construction Power

The [redacted] does not address any requirements for standby power or temporary construction power that the Project may require prior to the in-service date of the Interconnection Facilities. Should the Project require standby power or temporary construction power from SCE prior to the in-service date of the Interconnection Facilities, the IC is responsible to make appropriate arrangements with SCE to receive and pay for such retail.

11.9 Construction Schedule

The estimated time to construct (ETC) is for a typical project; schedules and duration may change due to number of projects approved and release dates. Stacked projects impact resources, system outage availability, and environmental windows of construction. The assumption is that SCE will need to obtain CPUC licensing and regulatory approvals prior to design, procurement and construction of the proposed facilities required to serve the interconnection customer and prerequisite facilities are in service.

12.1 11.10 Telecommunication Assumptions

The cost for telecommunication facilities that were identified as part of the IC's Interconnection Facilities was based on an assumption that these facilities would be sited, licensed, and constructed by SCE as opposed to the IC doing this work (IC may own, operate, maintain, and construct diverse telecommunication paths associated with the IC's gen tie, excluding terminal equipment at both ends). In addition, the telecommunication requirements for SPS were assumed based on tripping of the generator breaker as opposed to tripping the circuit breakers at the SCE substation. Due to uncertainties related to telecommunication upgrades for the numerous projects in queue ahead of Phase II, telecommunication upgrades for higher queued projects were not considered in this study. Depending on the outcome of interconnection studies for higher queued projects, the telecommunication upgrades identified for Phase II may be reduced. Any changes in these assumptions may affect the cost and schedule for the identified telecommunication facilities.

Attachment 1

Generator Machine Dynamic Data

Not required

Attachment 2

Dynamic Stability Plots

Please refer to Appendix F of the Group Report.

Attachment 3

SCE Interconnection Handbook

Preliminary Protection Requirements for Interconnection Facilities are outlined in the SCE Interconnection Handbook.

Attachment 4

Short Circuit Calculation Study Results

Please refer to Appendix H of the Group Report.

Attachment 5

Deliverability Assessment Results

There is no deliverability upgrade required for the Project.

Attachment 6

Allocation of Network Upgrades for Cost Estimates

Type	Upgrades	Cost Factor	Cost Share ($1,000)
Distribution Upgrade	[redacted]	100%	$8,414
Distribution Upgrade	[redacted]	51.6%	$6,077