
Appendix A – WDT1003ISP



QUEUE CLUSTER 6 PHASE II REPORT

November 20, 2014

This study has been completed in coordination with CAISO per CAISO Tariff Appendix DD Generator Interconnection Procedures and Deliverability Allocation Procedures (GIDAP)

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Attachments:

- 1. Interconnection Facilities, Network Upgrades and Distribution Upgrades**
- 2. Escalated Cost and Time to Construct for Interconnection Facilities, Reliability Network Upgrades, Delivery Network Upgrades, and Distribution Upgrades**
- 3. Allocation of Network Upgrades for Cost Estimates**
- 4. Distribution Provider Interconnection Handbook**
- 5. Short Circuit Calculation Study Results (see Appendix H of the area report)**

A. Introduction

[REDACTED] an Interconnection Customer (IC), previously submitted a completed Interconnection Request (IR) to SCE under the Independent Study Process (ISP), in accordance with the Wholesale Distribution Access Tariff (WDAT) Attachment I Section 5.2.1, for their proposed [REDACTED] (Project). The Project is an incremental 5 MW addition to the existing 27.4 MW generating facility which consists of four (4) combined cycle units with its Point of Interconnection (POI) at SCE's Brea 66 kV Substation, connected to the Olinda 220/66 kV System. The IC elected that the Project be Option B with Full Capacity Deliverability Status. The Project has a Commercial Operation Date (COD) of August 7, 2013.

In accordance with the ISP, the cost and schedule for the Interconnection Facilities, Distribution Upgrades and Reliability Network Upgrades required to interconnect the Project, under Energy Only Deliverability status, have been addressed. The results are disclosed in SCE's previously issued System Impact Study (SIS) report package that included the WDAT System Impact report dated May 15, 2013.

In its IR (Interconnection Request), the IC elected Full Capacity Deliverability Status for the Project, and in accordance with WDAT Attachment I Section 5.6, the Project was included in the QC6 Phase II Interconnection Study for the purpose of performing an initial deliverability assessment for evaluation of the requested Full Capacity Deliverability Status. Similarly, in compliance with WDAT Attachment 1, Section 5.8.1.1, costs associated with Short Circuit Duty (SCD) mitigations may be assessed by the Project for impacts on the CAISO grid.

An area 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 or impact contributions of the Project, and it is not intended to supersede any contractual terms or conditions specified in an Interconnection Agreement.

The report provides the following:

1. Identify impacts on the CAISO Controlled Grid of the Project associated with the Full Capacity Deliverability Status;
2. Preliminarily identify all Delivery Network Upgrades required to provide the Project with Full Capacity Deliverability Status;
3. Preliminarily identify Reliability Network Upgrades required due to Full Capacity Deliverability Status;
4. Establish the cost responsibility for Network Upgrades assigned to the IC due to Full Capacity Deliverability Status. A good faith estimate of the Project's cost responsibility and time to construct¹ these facilities is provided in Attachment 1 and Attachment 2 as separate documents in the Appendix A Project report package.

For the detailed Project description and Project interconnection/POI discussion please refer to previously issued ISP Project reports mentioned above.

¹ It should be noted that construction is only part of the duration of months specified in the study, includes final engineering, licensing, etc, and other activities required to bring such facilities into service. These durations are from the execution of the Interconnection Agreement, receipt of: all required information, funding, and written authorization to proceed from the IC as will be specified in the Interconnection Agreement to commence the work.

B. Study Assumptions

For detailed assumptions, please refer to the QC6 Phase II area report. Project interconnection assumptions remain the same as the Project ISP study report(s).

C. Reliability Assessment Results

1. Steady State Power Flow Analysis Results

Because the steady state flow reliability impacts of the Project have been identified in the Project ISP interconnection studies, there were no identified power flow reliability issues associated with the Project Full Capacity Deliverability Status.

2. Short Circuit Duty Analysis

(a) Study Results

All bus locations where the QC6 Phase II projects increase the short-circuit duty by 0.1 kA or more and where duty was found to be in excess of 60% of the minimum breaker nameplate rating are listed in the area report (Appendix H). These values have been used to determine if any equipment is overstressed as a result of the inclusion of QC6 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.

Please refer to the QC6 Phase II area report for the QC6 Phase II breaker evaluation identified overstressed circuit breakers at the SCE buses, and Attachment 2 for the pro-rata allocation with corresponding estimated costs (if any) for the Project, based on SCD contribution at each location

(b) SCE Substations with Ground Grids Duty Concerns

The short circuit studies flagged SCE-owned substations beyond the Project POI with ground grid duty concerns that necessitate a ground grid study. However, the Project does not contribute to the duty concerns at hand, and did not get allocated costs for ground grid studies at the flagged SCE-owned substations.

(c) Preliminary Protection Requirements

Protection requirements are designed and intended to protect the Distribution Provider's system only. The IC is responsible for the protection of its own system and equipment and must meet the requirements in the Distribution Provider Interconnection Handbook provided in Attachment 4.

3. Transient Stability Evaluation

Because the transient stability reliability impacts of the Project have been identified in the Project ISP interconnection studies, there were no identified transient stability reliability issues associated with the Project to Full Capacity Deliverability Status.

4. Reactive Power Deficiency Analysis

The Project will need to be designed to maintain a composite power delivery at continuous rated power at the POI as stated in the Energy Only Interconnection Agreement.

D. Deliverability Assessment Results

1. On Peak Deliverability Assessment

The Project contributes to a local deliverability constraint, i.e. Barre – Del Amo 220kV line overload as shown in Section E.1 of the Area report. No area deliverability constraint was identified for the Project.

2. Required Mitigations

The following Network Upgrade is required for the Project to achieve Full Capacity Deliverability Status:

- Upgrade Barre – Del Amo 220kV transmission line

3. Interim Operational Deliverability Assessment for Information Only

The operational deliverability assessment was performed for study years 2015, 2015 and 2019 by modeling the transmission and generation in service in the corresponding study year. For details of the transmission and generation assumption, refer to Section E of the area report. There is no operational deliverability constraint identified. The Project could have Interim Deliverability Status before the required Network Upgrade is in service under the year by year transmission and generation assumptions. However, if some or all the transmission upgrades are delayed or more generation is actually in commercial operation than assumed, the interim deliverability of the Project will be impacted.

E. Network Upgrades, Cost, and Construction Duration Estimates

To determine the cost responsibility of each generation project in QC6 Phase II, the CAISO developed cost allocation factors (Attachment 3) for Reliability Network Upgrades, Local Delivery Network Upgrades and Area Delivery Network Upgrades. Attachment 2 provides the 'constant' 2014 dollars and their escalation to the estimated COD year for Interconnection Facilities, Reliability Network Upgrades, Delivery Network Upgrades, and Distribution Upgrades which the Project was allocated cost.

For the QC6 Phase II Study, the estimated COD is derived by assuming the duration of the work element will begin in December 2015, which accounts for the CAISO tariff scheduled completion date of the QC6 Phase II study plus: the TP Deliverability (TPD)² allocation, Annual Reassessment effort, and the interconnection agreement signing period and submittal of required funds by the IC.

The IC should note that any Local Delivery Network Upgrades and Area Delivery Network Upgrades allocated to the Project may be assessed 35% ITCC pending the results of the TPD allocation Process several months after the QC Phase II Study Reports are released, in addition to the 35% ITCC assessed for the IFs, DUs, and RNUs above the \$60K/MW repayment cap allocated to the Project. For your information, Attachment 2 contains a potential ITCC estimate³

² Transmission Plan Deliverability: Deliverability supported by the CAISO's Transmission Plan

³ The maximum ITCC exposure applies ITCC (35%) to assigned IF and DU facilities, Network Upgrades that are not subject to transmission credits incremental to a repayment \$/MW cap or an award of 0 MW TPD Allocation, and that SCE will own the facilities in question. The maximum ITCC exposure was calculated by applying the following formula: $(IF*35\%)+((RNU\ Costs - (Project\ MW * (\$60K/MW)))*35\%)+(LDNU*35\%)+(ADNU*35\%)+(DU*35\%)$

based on the Phase II cost in this study. It does not represent the “maximum ITCC exposure” of the Project. Attachment 3 provides an estimated non-reimbursable RNU cost that would be subject to ITCC, taking into account the Network Upgrade maximum cost responsibility. The maximum ITCC warranted by the Project will be addressed, calculated, and included during the Interconnection Agreement development phase once the IC submits the TPD Affidavit confirming the acceptance, waiver (parking), or denial of awarded deliverability assigned to the Project.

F. SCE Technical Requirements

The IC is responsible for the protection of its own system and equipment and must meet the requirements in the Distribution Provider Interconnection Handbook provided in Attachment 4.

G. Environmental Evaluation, Permitting, and Licensing

Please see Appendix K of the QC6 Phase II area report.

H. Affected Systems Coordination

Please see Section H of the QC6 Phase II area report

I. Items not covered in this study

For a list of items not covered in this study, see the Project ISP study report(s) and the QC6 Phase II Area report.

Attachment 1

Interconnection Facilities, Network Upgrades and Distribution Upgrades

Please refer to separate document

Attachment 2

**Escalated Cost and Time to Construct for Interconnection Facilities, Reliability
Network Upgrades, Delivery Network Upgrades, and Distribution Upgrades**

Please refer to separate document

Attachment 3

Allocation of Network Upgrades for Cost Estimates

Allocation of RNU and LDNU for Cost Estimates

Queue #	WDT1003ISP			
	Upgrade Cost 2014 (\$1000)	Project Allocation (%)	Project Cost 2014 (\$1000)	Project Cost Escalated (\$1000)
LDNU	\$1,678	0.27%	\$5	\$5
Barre-Del Amo Line Clearance Mitigation: Increase emergency rating of Del Amo - Barre 220kV line	\$1,678	0.27%	\$5	\$5
Grand Total	\$1,678		\$5	\$5

Summary of Cost Estimates

Phase I RNU & LDNU (Escalated \$1000)	\$	-
Total Phase II RNU (Escalated \$1000)	\$	-
Total Phase II LDNU (Escalated \$1000)	\$	5
Total Phase II RNU & LDNU (Escalated \$1000)	\$	5
Max RNU & LDNU Cost Responsibility (Escalated \$1000)	\$	-
Total RNU & LDNU Cost (Escalated \$1000)	\$	-
Deliverability Option		B
Phase II ADNU (Escalated \$1000)	\$	-
Max Net Output (MW)		5
RNU Cost Reimbursement Limit (\$1000)	\$	300
RNU Cost (Escalated \$1000)	\$	-
RNU Non-Reimbursable Cost (Escalated \$1000)	\$	-

Attachment 4

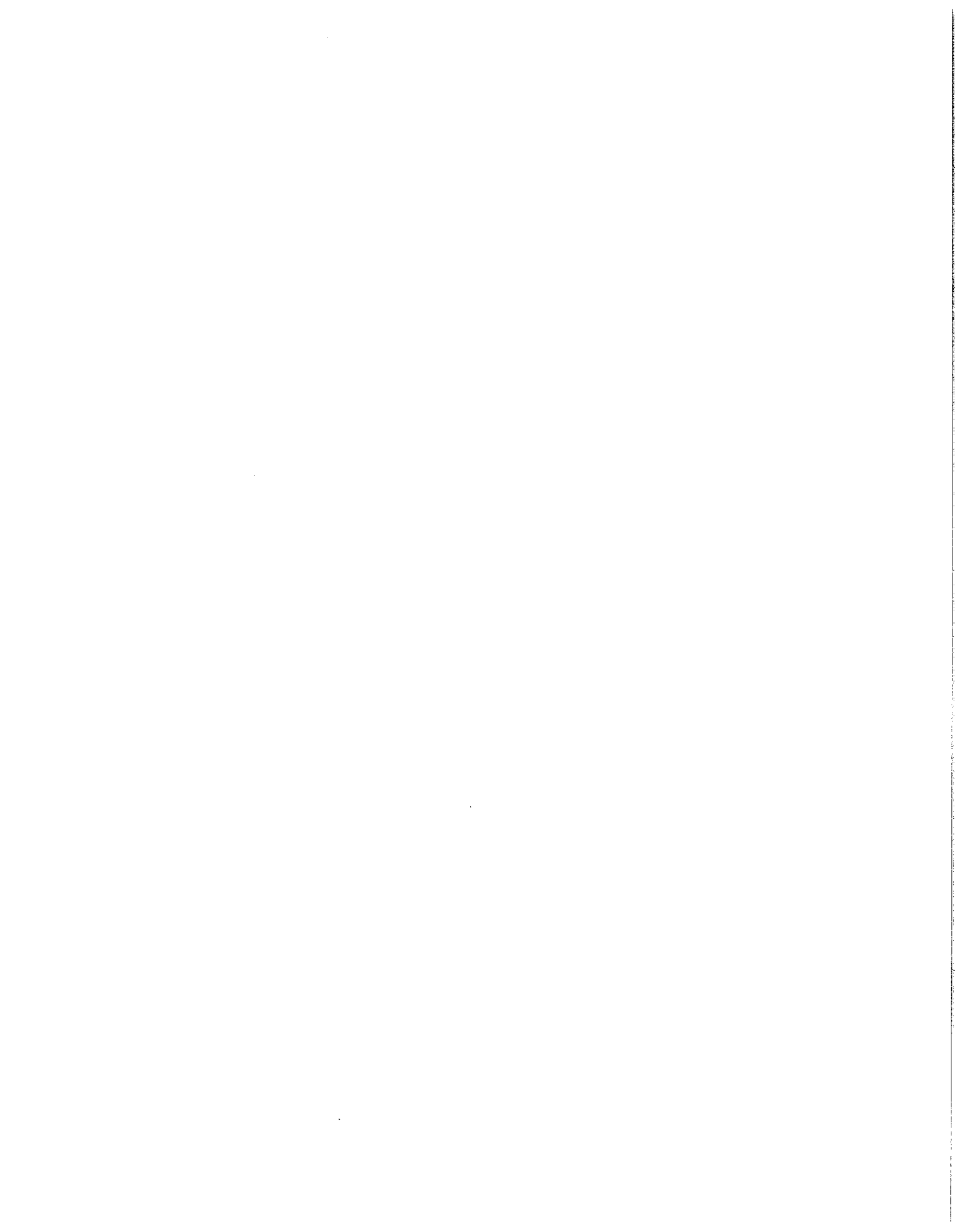
Distribution Provider Interconnection Handbook

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

Attachment 5

Short Circuit Calculation Study Results

Please refer to the Appendix H of the area report.



Queue Cluster 6 Phase II - Attachment 1
WDT 240 & WDT 268 & WDT1003ISP – [REDACTED]
Interconnection Facilities, Network Upgrades, and Distribution Upgrades

Interconnection Facilities, Network Upgrades and Distribution Upgrades

To determine the cost responsibility of each generation project in QC6, the California Independent System Operator Corporation (CAISO) developed cost allocation factors (Attachment 3) for Reliability Network Upgrades and Local Delivery Network Upgrades. The CAISO developed the \$/MW cost rate for incremental Area Delivery Network Upgrades. The cost rate multiplied by the requested deliverable MW capacity provides the cost estimate for the Area Delivery Network Upgrades. The Interconnection Facilities are the sole cost responsibility of the Project. The Interconnection Facilities, Network Upgrades, and Distribution Upgrades allocated to the project are listed below¹.

(a) Interconnection Facilities.

1. **Interconnection Customer's Interconnection Facilities.** The Interconnection Customer shall:

- (i) All required ISO meters and metering equipment
- (ii) [REDACTED] at the Large Generating Facility's switchyard
- (iii) [REDACTED]
- (iv) [REDACTED]
- (v) [REDACTED]
- (vi) [REDACTED]

2. **Distribution Provider's Interconnection Facilities.** The Distribution Provider shall:

- (i) [REDACTED]
 - a. [REDACTED]
 - b. [REDACTED]

¹ Such descriptions are subject to modification to reflect the actual facilities that are constructed and installed following the Participating TO's final engineering and design, identification of field conditions, and compliance with applicable environmental and permitting requirements.

Interconnection Facilities, Network Upgrades and Distribution Upgrades

c. Equip Position 3

- [REDACTED]
- [REDACTED]
- [REDACTED]

d. Terminate the proposed [REDACTED] Generation Tie-Line at position 5

- [REDACTED]
- [REDACTED]
- [REDACTED]

(ii) **Power Systems Control.**

- a. [REDACTED] to be located at the Large Generating Facility. The remote terminal unit shall monitor the large Generating Facility's net MW, MVAR, terminal voltage, auxiliary load MW, MVAR, and other necessary alarms. Notwithstanding the Point of Change of Ownership, the remote terminal unit will be owned, operated, and maintained by the Participating TO.
- b. Install one new contact point to the existing substation automation system at Brea Substation to monitor net MW, MVAR, amps, 66kV circuit breaker status, and other necessary alarms related to the proposed [REDACTED] Generation Tie-Line

(iii) **Telecommunication.**

- a. [REDACTED] and the Large Generating Facility site:
- [REDACTED] The cable continues underground to a point that is approximately 200 feet north of where the Tie-line rises up from underground. At that point the cable rises up on the first wood pole north of where the Tie-line rises up. The cable continues overhead to the remote terminal unit. At the remote terminal unit, the cable dips underground to enter the remote terminal unit.

Interconnection Facilities, Network Upgrades and Distribution Upgrades

- SCE will use Reasonable Efforts to install this fiber optic cable within the same trench as the 66 kV conductors for [REDACTED] [REDACTED] kV Generation Tie-Line, except for where the fiber optic cable must pass around the splice boxes for the [REDACTED] kV Generation Tie-Line, which will require minimal trenching. SCE will use Reasonable Efforts to minimize the required trenching for the fiber-optic cabling around the splice boxes for the [REDACTED] kV Generation Tie-Line.
 - b. Install one sonnet terminal and one channel terminal facility at [REDACTED] [REDACTED].
 - c. Install one sonnet terminal and one channel terminal facility at the Large Generating Facility site.
 - d. [REDACTED] [REDACTED] These circuits may utilize the same pathway.
- (iv) [REDACTED] Generation Tie-Line.
- [REDACTED] Generation Tie-Line will be provided for under a separate agreement.

(b) Network Upgrades.

1. **Stand Alone Network Upgrades.**
None identified as part of the Phase II study.
2. **Other Network Upgrades.**
None identified as part of the Phase II study.
 - (i) **Participating TO's Reliability Network Upgrades.**
None identified as part of the Phase II study.
 - (ii) **Participating TO's Delivery Network Upgrades.**
 - a. **Area Delivery Network Upgrades.**
None identified as part of the Phase II study.
 - b. **Local Delivery Network Upgrades.** The Interconnection customer shall:
 - Upgrade the Barre- Del Amo 220 kV Transmission Line
 1. **Transmission.**

Interconnection Facilities, Network Upgrades and Distribution Upgrades

[REDACTED]

2. [REDACTED]

3. **Transmission Project Licensing and Corporate Environmental Health and Safety.**

Obtain licensing, permits and perform all required environmental activities for the installation of the project elements described above.

(c) Distribution Upgrades.

The Distribution Provider shall:

1. [REDACTED]

(d) Point of Change of Ownership.

The line-side insulator on the Interconnection Customer's dead-end tower in the Large Generating Facility's switchyard. The Interconnection Customer owns all the insulators, the jumper, and the dead-end tower.

(e) Point of Interconnection. The Distribution Provider's Brea 66kV Substation position 5.

(f)

