Appendix A – WDT1278

[redacted]

Queue Cluster 8 Phase I Report

January 15, 2016

This study has been completed in coordination with the California Independent System Operator Corporation (CAISO) per Southern California Edison Company's Wholesale Distribution Access Tariff, Attachment I Generator Interconnection Procedures (GIP)

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A. Introduction

[redacted] the Interconnection Customer (IC), has submitted a completed Interconnection Request (IR) to Southern California Edison Company (SCE) for their proposed [redacted] The Project requested a Point of Interconnection (POI) at Southern California Edison Company's (SCE) [redacted] located in Kern County, California. The CAISO Point of Deliverability is at [redacted] The IC requested Full Capacity Deliverability Status (FCDS) for their Project. The IC desires an In-Service Date (ISD) of October 31, 2018 and a Commercial Operation Date (COD) of December 31, 2018. Such dates are specified in the Project's IR submittal. Actual ISD and COD will depend on detailed design, engineering, and construction requirements to interconnect the Project after the Generator Interconnection Agreement (GIA) has been executed and filed at Federal Energy Regulatory Commission (FERC) for acceptance.

In accordance with FERC approved CAISO Tariff Appendix DD Generator Interconnection and Deliverability Allocation Procedures (GIDAP), the Project was grouped with Queue Cluster 8 (QC8) Phase I projects to determine the impacts of the group as well as impacts of the Project on the CAISO Controlled Grid.

An Area Report has been prepared separately identifying the combined impacts of all projects in the area 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 a GIA.

The report provides the following:

1. Transmission System impacts caused by the Project;
2. Distribution System impacts caused by the Project;
3. System reinforcements necessary to mitigate the adverse impacts caused by the Project under various system conditions;
4. A list of required facilities and a good faith estimate of the Project's cost responsibility and time to construct[1] these facilities. Such information is provided in Attachment 1 and Attachment 2 as separate documents in the Appendix A Project report package.

All the equipment and facilities comprising the Project's Generating Facility are located in Ridgecrest, California, as disclosed by the IC in its IR, as may have been amended during the Interconnection Study process, which consists of (i) [redacted] for a combined gross rated output of [redacted] (ii) the associated infrastructure, (iii) meters and metering equipment, (iv) appurtenant equipment, and (v) [redacted] of auxiliary loads.

Based on the technical data provided for collector system equivalent, pad-mount and main transformer banks, the total internal project losses were identified to be [redacted] In addition, the IC identified a total of [redacted] of aux load. Subtracting losses and aux load from the gross [redacted] would result in

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

a POI delivery [redacted] which is less than the [redacted] POI delivery requested amount. In addition, the identified site does not properly define site boundaries for this Project. As part of Phase II, the project will need to identify a project site with boundaries that are suitable for the requested project amount or make adjustments to the project size depending on site defined.

The Project shall consist of the Generating Facility and the IC's Interconnection Facilities as illustrated below in Figure A.1 and summarized below in Table A.1. Figure A.2 provides a map that illustrates the location of the Project.

Figure A.1: Project IC Facilities One-Line Diagram

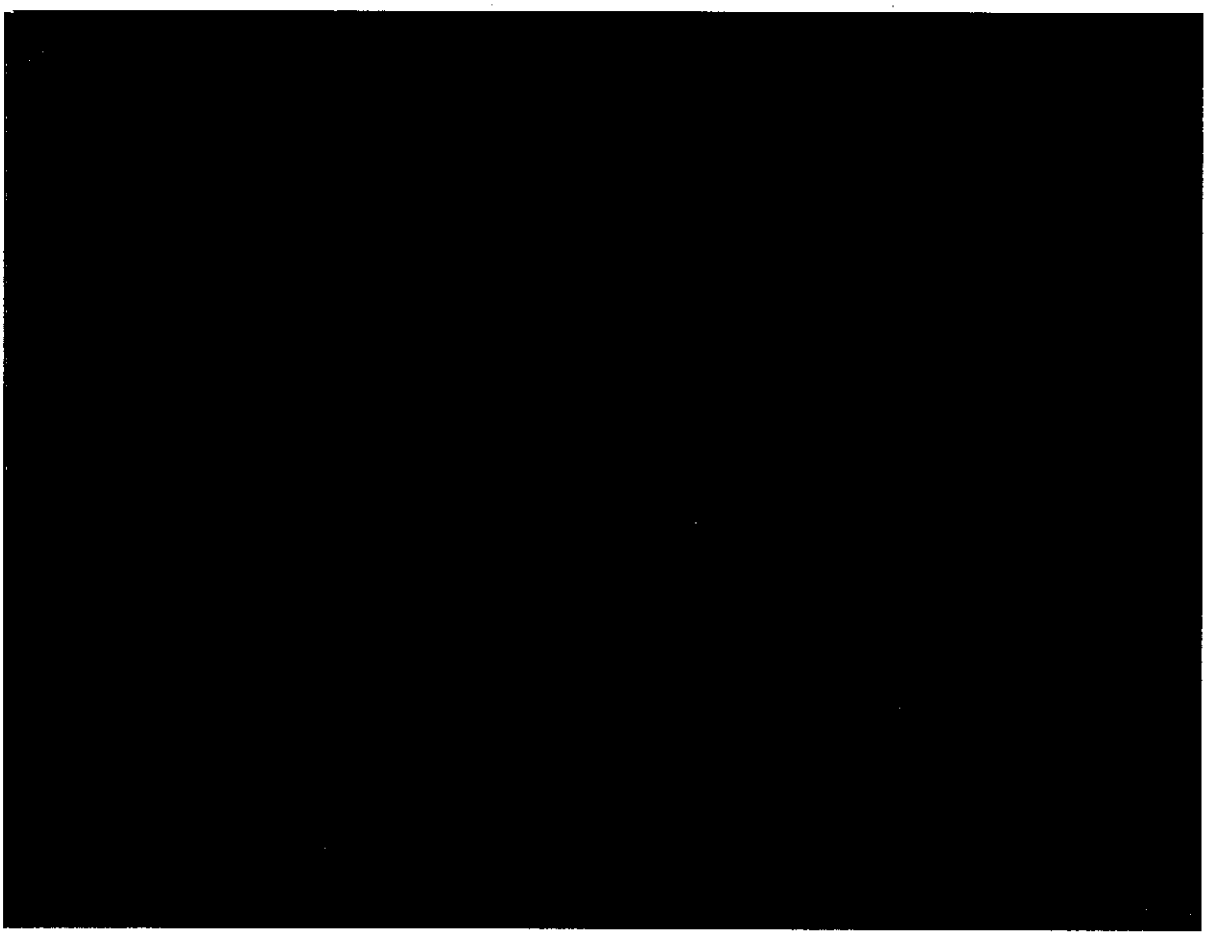


Figure A.2: Project Location Map

Table A.1 Project General Information

Project Location	[redacted]CA Kern County
Distribution Provider's Planning Area	SCE North of Lugo Area
Number and Types of Generators	[redacted]
Requested Maximum Project Output as measured at POI	[redacted]
Interconnection Voltage	[redacted]
POI	[redacted]
Gen-Tie	[redacted]
Step-up Transformer(s)	[redacted]
Estimated losses on Gen-Tie	[redacted](minimal distance results in negligible losses)
Step-up Transformer Losses based on IC Technical data	[redacted]
Pad-mount Transformer Losses based on IC Technical data	[redacted](no R value provided)
Total Auxiliary Load	[redacted]
Internal Generation Facility Losses based on IC Technical data for Collector System Equivalent	[redacted](no collector system equivalent provided)
Maximum POI Delivery (Gross output less losses less aux load)	[redacted]
Power Factor Range	[redacted]at POI per interconnection application
IC Requested COD	December 31, 2018

B. Study Assumptions

For detailed assumptions regarding the group cluster analysis, please refer to the QC8 Phase I area report. Below are the assumptions specific to the Project.

1. The following is the Plan of Service (POS) assumed for the Project in the Phase I Study:

   The Project was modeled as a[redacted](net at the POI) Photovoltaic Generating Facility with an interconnection to a new[redacted](will be referred as SCE W1278). The

Project will loop the [redacted] creating the [redacted]-W1278 and [redacted]

2. The following facilities will be installed by SCE and **are included** in this Phase I Study:

   - [redacted]
   - [redacted]
   - [redacted]
   - [redacted]
   - [redacted]
   - Lightwave, channel bank, and associated equipment at looped substation and at the Generating Facility.

   NOTE: SCE installation does not include metering, metering cabinet, 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.

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

   - The [redacted] from the Generating Facility to the last structure outside the SCE W1278 switchyard property line.
   - The [redacted] optical ground wire (OPGW) and an additional fiber optic line to provide two diversely routed telecommunication paths required for the line protection relays and the Special Protection System (SPS).
   - The required CAISO Metering Equipment (Voltage and Current Transformers), and metering cabinet for SCE revenue meter.

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

   - The following line protection relays to be installed at the Generating Facility end of the [redacted]
     - [redacted]

- [redacted]

- The following SPS Relays to be installed at the Generating Facility:
  - [redacted]
  - [redacted]

4. Other Items Considered:
   - [redacted] assumed to still be in service.
   - For this study, an additional reliability assessment for the charging of the [redacted] was evaluated. Please refer to Attachment 7 for additional details.

5. Additional QC8 Phase I Study and/or Assumption Notes:
   - The Project will need to participate in the [redacted] It is important to note that if the prior queued projects that triggered the need for modification of these SPSs do not materialize before the Project, the Project may choose to advance the costs of both RASs or wait for the triggering project to move forward.
   - It should be noted that any modifications to the [redacted] need to be presented to the WECC RASRS for approval. The WECC RASRS currently meets up to three (3) times a calendar year to review new and modifications to SPS systems. It should also be taken into account that engineering and design for any modification to both of the SPSs for the Distribution Provider and generator facilities must be finalized prior to presenting to the WECC RASRS for approval.

C. Reliability Standards, Study Criteria and Methodology

The generator interconnection studies will be conducted to ensure the CAISO-controlled grid is in compliance with the North American Electric Reliability Corporation (NERC) reliability standards, WECC regional criteria, and the CAISO planning standards. Refer to Section C of the Area Report for details of the applicable reliability standards, study criteria and methodology.

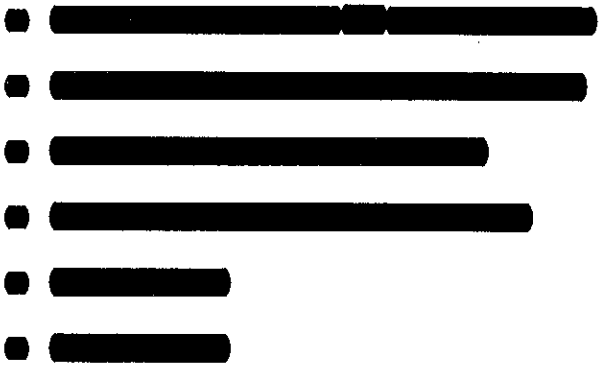
D. Power Flow Reliability Assessment Results

I. Steady State Power Flow Analysis Results

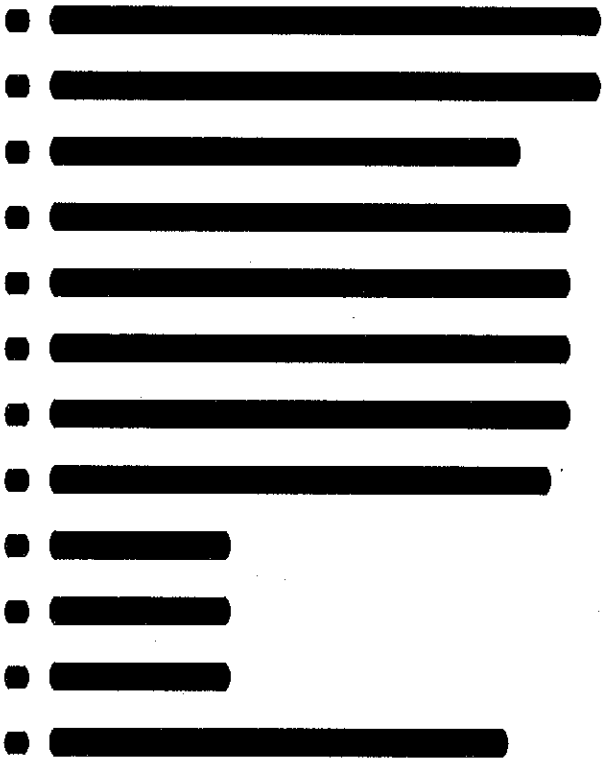
1. Thermal Overloads

   The group study indicated that the Project contributes to the following facility overloads or non-convergence problems. The details of the analysis and overload levels are provided in the area study.

- Category "P0"



- Category "P1"



- Category "P4"

[2] Identification of facility voltages (220 kV) in this QC8 Phase I Study are shown consistent with SCE System Operating Bulletin 123. However, all studies were predicated on the base voltages reflected in the Western Electricity Coordinating Council (WECC) base cases. For the SCE bulk power system, the WECC base cases reflect 230 kV and 500 kV base voltages; consequently, all per-unit calculations presented were based on 230 kV and 500 kV voltages

- [redacted]
- [redacted]

- Category "P7"
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]

- WECC Regional Criteria Adjacent Circuits
  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]

2. Power Flow Non-Convergence

   There were no non-convergence issues identified with the inclusion of the Project operating with SPS at the required power factor range, refer to Area Report for additional details.

3. Voltage Performance

   The Project is required to provide power factor regulation capability [redacted] to alleviate power flow non-convergence and maintain the transmission transfer capability.

4. Required Mitigations

   A combination of congestion management, the Project providing [redacted] power factor regulation capability at the POI, and SPS to trip the Project under identified contingency outage conditions are required to mitigate the power flow impacts of the Project described above. The Reliability Network Upgrades discussed in the Area Report and assigned to the Project are as follows:

   a. Add Project to existing [redacted]

      The Project will need to be added as a participant to the existing [redacted] Replace with modified [redacted] to include the new WDT1278 to trip the generation under the following outages:

[redacted]

b. Add Project to existing [redacted] (replaced with [redacted]

The Project will need to be added as a participant to the [redacted] (replaced with [redacted] Include the new WDT1278 interconnection to the existing [redacted] to trip the new generation tripping signals under the following outages:

[redacted]

Refer to Attachment 1 and Attachment 2 for scope description and associated project cost responsibility of these Distribution Upgrade(s).

E. Short Circuit Duty Results

Short circuit studies were performed to determine the fault duty impact of adding the QC8 Phase I 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 QC8 Phase I is determined. Each project in the cluster will be responsible for its share of the upgrade cost based on the rules set forth in CAISO Tariff Appendix DD.

1. Short Circuit Duty Study Input Data

The IC provided technical data for the identified inverter (specified in Section 2). SCE compared the technical data provided against manufacturer data, if the manufacturer Short Circuit Duty (SCD) information for the specific inverter was available. If the technical data provided by the IC differed from the inverter manufacturer data, then SCE utilized the manufacturer data in the SCD analysis.

Based on the comparison, the technical data provided by the IC are consistent with the manufacturer data.

"Inverter Based Generation"

Data for Each generation unit: Maximum Fault contribution: [redacted]

Generation tie-line:

Length:	[redacted]
Conductor:	[redacted]
Z1(p.u.) conductor impedance information:	[redacted]
Z0(p.u.) conductor impedance information:	[redacted]

Collector System:

Technical data provided by the IC indicate the following parameters as representative for each collector circuit. These values were used to represent the collector feeders served by each transformer bank.

Z1(p.u.) conductor impedance information:	[redacted]
Z0(p.u.) conductor impedance information:	[redacted]

Generation Step-up and Pad-Mount Transformers

Technical details are provided above in Table A.1.

2. Short Circuit Duty Study Results

All bus locations where the QC8 Phase I projects increase the short-circuit duty by [redacted] or more and where duty was found to be in excess of 60% of the minimum breaker nameplate rating are listed in the QC8 Phase I Area Report (Appendix H). These values have been used to determine if any equipment is overstressed as a result of the inclusion of QC8 Phase I 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 IRs in that Group Study pro rata on the basis of SCD contribution of each Generating Facility.

Please refer to the QC8 Phase I Area Report for the QC8 Phase I breaker evaluation which did not identify any additional overstressed circuit breakers triggered with the inclusion of QC8 Phase I without ADNUs.

As a sensitivity, ADNUs identified for QC8 Phase I were included to review the potential for additional SCD mitigation (classified as ADNU). This sensitivity study identified the effective duty at [redacted] (E) to increase from [redacted] which is in excess of current maximum nameplate ratings. To mitigate this SCD problem, a system reconfiguration would be needed to

lower SCD to within the maximum [redacted] No cost estimates were identified for this mitigation at this time but will be further reviewed as part of QC8 Phase II.

3. SCE Substations with Ground Grid Duty Concerns

   The short circuit studies flagged for further review a total of [redacted] existing substations where the QC8 Phase I Projects increased the substation ground grid duty by at least [redacted] Additional review will be performed as part of Phase II to determine if any of these locations will require a detailed ground grid analysis performed as part of project execution once GIAs are in place and projects proceed forward towards interconnection.

4. Preliminary Protection Requirements

   Protection requirements are designed and intended to protect the Distribution Provider's Distribution System only. The preliminary protection requirements were based upon the interconnection plan as shown in the one-line diagram depicted in line item #7 in Attachment 1.

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

F. Transient Stability Evaluation

With the Project providing [redacted] as measured at the POI and including the required mitigation identified above, transient stability performance was found to be acceptable. Refer to Sections C.3 and D.2 of the Area Report, for additional details pertaining to the QC8 PI transient stability evaluation criteria and assessment results, respectively.

G. Power Factor Requirements

Based on the results of the Study, the Project will need to be designed to maintain a composite power delivery at continuous rated power at the POI at a power factor within the range of [redacted] Additionally, the generation system must be designed to accommodate a VAR schedule provided by SCE. SCE will determine if the VAR schedule is necessary based on future re-arrangements of SCE's Transmission System.

H. Deliverability Assessment Results

1. On Peak Deliverability Assessment

   The Project contributes to the [redacted] area constraints as shown in the NOL Area Report Section E.1 Table E.1.2.

   The project also contributes to the overloads listed in the NOL Area Report Section E.1 Table E.1.1 for the following contingencies:

- [redacted]
- [redacted]
- [redacted]

2. Off- Peak Deliverability Assessment

   For off-peak condition studies, see Section D.1.1 Table D-2 and Table D-4 in the NOL Area Report.

3. Required Mitigations

   For area constraints, conceptual ADNU's are proposed to increase the generation deliverability for additional details, see the NOL Area Report Section E.1.3.

   For contingency concerns, the Project is required to participate in the existing [redacted] and [redacted] (expanding to the [redacted]

I. Interconnection Facilities, Network Upgrades, and Distribution Upgrades

Please see **Attachment 1** for the Distribution Provider's Interconnection Facilities (IF), Reliability Network Upgrades (RNUs), Delivery Network Upgrades (DNUs), and Distribution Upgrades (DUs) allocated to the Project. Please note that SCE will not "reserve" the identified IF for the proposed POI. The identified scope/facilities will be allocated to the Project upon the successful execution of the GIA and SCE has completed the detailed design and engineering of the facilities according to tariff timelines.

J. Cost and Construction Duration Estimates

To determine the cost responsibility of each generation project in QC8 Phase I, the CAISO developed cost allocation factors (Attachment 3) for RNUs, Local Delivery Network Upgrades (LDNUs) and Area Delivery Network Upgrades (ADNUs). Attachment 2 provides the 'constant' 2015 dollars and their escalation to the estimated COD year for IF, RNUs, DNUs, and DUs which the Project was allocated cost.

For the QC8 Phase I Study, the estimated COD is derived by taking into account time requirements to complete the QC8 Interconnection Process to tender a GIA. A GIA is not scheduled to be tendered until after completion of the QC8 Phase II Studies, Reassessment and Transmission Planning Deliverability (TPD)[3] Allocation Study Process. The QC8 Phase II Study is scheduled to start on May 2016 and be completed by November 2016. Subsequently, the CAISO's Annual Reassessment effort and TPD Allocation Study does not commence until late January or early February 2017. The TPD Allocation Study is scheduled to be completed by April 2017. If the CAISO and SCE can make a determination that the TPD Allocation Study Process outcomes do not change the scope requirements, a letter will be provided at the end of April 2017[4] informing the IC that there are no changes to Network Upgrade requirements and initiating the GIA negotiation process. Otherwise, further re-assessment will be

[3] Transmission Plan Deliverability: Deliverability supported by the CAISO's Transmission Plan
[4] The TPD Allocation Process is estimated to complete in April 2017. The actual date may vary

performed for the Project. Any updates to scope, cost and schedule are developed and updated Interconnection Study reports will be issued by the end of July 2017. The GIA negotiations commence after either the issuance of the letter of no change to Network Upgrade requirements at the end of April 2017 or upon issuance of the updated reports at the end of July 2017. Provided the Project does not elect to Park for one (1) year, the letter issued by the CAISO and/or the updated Interconnection Study reports will be used as the basis to proceed with the GIA negotiations. Assuming a three (3) month timeframe for GIA negotiations after the draft GIA has been issued to the IC, an executable GIA is not expected until either early August 2017 or early November 2017 depending on TPD Allocation Study Process results, which requires a decision from the IC to Park or proceed and will determine if the Project needs to complete the CAISO's Reassessment Study. QC8 Phase I assumed the duration of the work element begins in December 2017, which accounts for the GIA and submittal of required funds by the IC.

Based on the above, the requested IC ISD of October 1, 2018 cannot be met due to the estimated 80 month timeline identified as required to add this project to two SPSs. Following the standard interconnection process, the ISD should be modified to reflect June 2024 but may be later advanced to March 2024 depending on TPD Allocation Study Process results. This date may be improved upon provided the IC includes all scope needed to interconnect the project into the Project's environmental efforts. If the IC desires to accelerate timelines, SCE is open to discussing accelerating GIA execution during Results Meetings.

The IC should note that any LDNUs and ADNUs allocated to the Project may be assessed 35% Income Tax Component of Contribution (ITCC) pending the results of the TPD Allocation Study Process several months after the QC Phase II Study Reports are released, in addition to the 35% ITCC assessed for the IF, DUs, and RNUs above the $60K/MW repayment cap allocated to the Project. For your information, Attachment 2 contains a potential ITCC estimate[5] based on the Phase I 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 GIA development phase once the IC submits the TP Deliverability Allocation Study Process options form used to confirm the acceptance, waiver (parking), or denial of the awarded deliverability assigned to the Project.

K. 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's Interconnection Handbook provided in Attachment 4.

[5]The maximum ITCC exposure applies ITCC (35%) to assigned IF and DU facilities. For Network upgrades, costs that are not subject to transmission credits and/or exceed the $60k/MW cap will be subject to ITCC (35%). For Option A facilities: The maximum ITCC exposure is calculated by applying the following formula: (IF*35%) + ((RNU Costs – (Project MW*($60k/MW)))*35%) + (DU*35%). For Option B facilities: The maximum ITCC exposure is calculated by applying the following formula: (IF*35%) + ((RNU Costs – (Project MW*($60k/MW)))*35%) + (LDNU*35%) + (ADNU*35%) + (DU*35%)

L. Subsynchronous Interaction Evaluations

Certain generators or inverter based generators when interconnected within electrical proximity of series capacitor banks on the transmission system are susceptible to Sub-Synchronous Interaction (SSI) conditions which must be evaluated. Subsynchronous Interaction evaluations include Subsynchronous Resonance (SSR) and Subsynchronous Torsional Interactions (SSTI) for conventional generation units, and Subsynchronous Control Instability (SSCI) for inverter based generators using power electronic devices (e.g. Solar PV and Wind Turbines).

For projects interconnecting at the 220 kV voltage level and above in close electrical proximity of series capacitor banks on the transmission system a study will need to be performed to evaluate the SSI between generating facilities and the transmission system.

The IC is 100% responsible for any studies related to the SSR or SSTI. The only study that SCE will perform (at the IC's expense) is for SSCI; to ensure that the Project does not damage SCE's control systems.

The SSCI study will require that the IC provide a detailed PSCAD model of its Generating Facility and associated control systems, along with the manufacturer representative's contact information. The study will identify any mitigation(s) that will be required as part of project execution and need to be completed prior to initial synchronization of the Generating Facility. The study and the proposed mitigation(s) shall be at the expense of the IC.

It is the IC's responsibility to select, purchase, and install turbine/inverter based generators that are compatible with the series compensation in the area.

M. Environmental Evaluation, Permitting, and Licensing

Please see Appendix K of the QC8 Phase I Area Report.

N. Affected Systems Coordination

Please see Section H of the QC8 Phase I Area Report.

O. Items not covered in this study

1. Conceptual Plan of Service

   The results provided in this study are based on conceptual engineering and a preliminary POS and are not sufficient for permitting of facilities. The POS is subject to change as part of detailed engineering and design.

2. IC's Technical Data

   The study accuracy and results for the QC8 Phase I Study are contingent upon the accuracy of the technical data provided by the IC. Any changes from the data provided could void the study results.

3. Study Impacts on Neighboring Utilities

   Results or consequences of this QC8 Phase I 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). Refer to Affected Systems Coordination Section of the QC8 Phase I Area Report for additional information.

4. Use of Distribution Provider Facilities

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

5. Distribution Provider's Interconnection Handbook

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

6. Western Electricity Coordinating Council (WECC) Policies

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

7. System Protection Coordination

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

8. Standby Power and Temporary Construction Power

   The QC8 Phase I Study does not address any requirements for standby power or temporary construction power that the Project may require prior to the ISD of the Interconnection Facilities. Should the Project require standby power or temporary construction power from Distribution Provider prior to the ISD of the Interconnection Facilities, the IC is responsible to make appropriate arrangements with Distribution Provider to receive and pay for such retail service.

9. Licensing Cost and Estimated Time to Construct Estimate (Duration)

   The estimated licensing cost and durations applied to this Project are based on the Project scope details presented in this study. These estimates are subject to change as Project environmental and real estate elements are further defined. Upon execution of the GIA, additional evaluation including but not limited to preliminary engineering, environmental surveys, and property right checks may enable licensing cost and/or duration updates to be provided.

10. Network/Non-Network Classification of Telecommunication Facilities

    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 the IC. The IC will own, operate, maintain, and construct diverse telecommunication paths associated with the IC's generation tie line, 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 Distribution Provider substation. Due to uncertainties related to telecommunication upgrades for the numerous projects in queue ahead of QC8 Phase I, 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 QC8 Phase I may be reduced. Any changes in these assumptions may affect the cost and schedule for the identified telecommunication facilities.

11. Ground Grid Analysis

    A detailed ground grid analysis will be required as part of the detailed engineering for the Project at the SCE substations whose ground grids were flagged with duty concerns.

12. Applicability

    This document has been prepared to identify the impact(s) contributions of the Project on the SCE electrical system; as well as establish the technical requirements to interconnect the Project to the POI that was evaluated in the QC8 Phase I Study for the Project. Nothing in this report is intended to supersede or establish terms/conditions specified in fully executed GIAs.

13. Process for synchronization/trial operations and commercial operations of the Project

    The IC is reminded that the CAISO has implemented a New Resource Implementation (NRI) process that ensures that a generation resource meets all requirements before synchronization/trial operations and commercial operations. The NRI uses a bucket system for deliverables from the IC that are required to be approved by the CAISO. The first step of this process is to submit an "ISO Initial Contact Information Request form" at least seven (7) months in advance of the planned initial synchronization. Subsequently an NRI project number will be assigned to the project for all future communications with the CAISO. The PTOs have no involvement in this NRI process except to inform the IC of this process requirement. Further information on the NRI process can be obtained from the CAISO Website using the following links:

    New Resource Implementation webpage:
    http://www.caiso.com/participate/Pages/NewResourceImplementation/Default.aspx

NRI Checklist:
http://www.caiso.com/Documents/NewResourceImplementationChecklist.xls

NRI Guide:
http://www.caiso.com/Documents/NewResourceImplementationGuide.doc

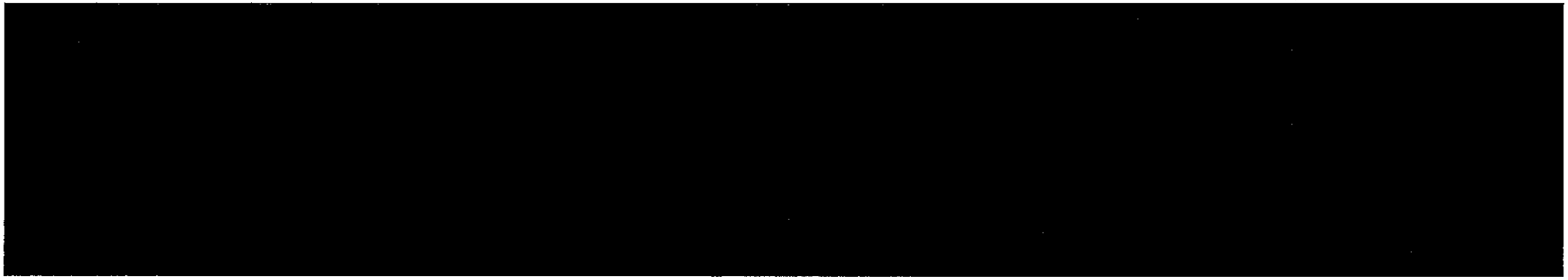
14. Potential Changes in Cost Responsibility

The IC is hereby placed on notice that interconnection of its proposed Generating Facility may be dependent upon certain Network Upgrades which are currently the cost responsibility of projects ahead of the proposed Generating Facility in the interconnection application queue. Section 14.2.2 of the GIDAP provides that should Network Upgrades required for queued-ahead projects be included in an executed GIA (or unexecuted GIA filed at FERC) at the time of withdrawal of the earlier queued Generating Facility, and the upgrades are determined to still be needed by later queued Generating Facilities, the financial responsibility for such upgrades falls to the Distribution Provider. However, if the Network Upgrades required by earlier queued Generating Facilities are not subject to an executed GIA (or unexecuted GIA filed at FERC) the financial responsibility for such upgrades may fall to the IC. Section 14.2.2 also discusses how Network Upgrades required by interconnection customers selecting Option (B) might be required to be reapportioned among interconnection customers selecting Option (B) in the case of withdrawals of earlier queued Generating Facilities. Changes in costs allocated to the IC could also arise as the result of the CAISO's Reassessment Study process described in Section 7.4 of the GIDAP. SCE encourages the IC to review Sections 7.4 and 14.2.2 of the GIDAP for the rules and processes under which the financial responsibility might be reapportioned to the IC. Potential changes in the IC's cost responsibility resulting from application of the provisions of these Sections of GIDAP are not included in this QC8 Phase I Study, nor are the potential impacts to the IC's maximum cost responsibility outlined.

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



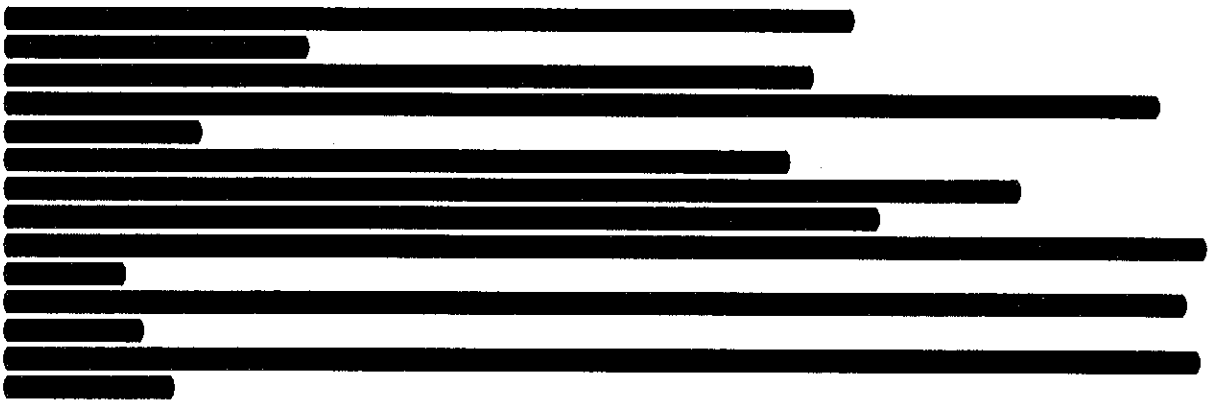
Attachment 4
Distribution Provider's Interconnection Handbook

Preliminary Protection Requirements for Interconnection Facilities are outlined in the Distribution Provider's Interconnection Handbook (separate document)

Attachment 5
Short Circuit Duty Calculation Study Results
Please refer to the Appendix H of the Area Report

Attachment 6
Interconnection Customer Provided Project Dynamic Data

The following data were submitted by the IC for Dynamic simulation:



Attachment 7
SCE Northern Hemisphere Import Nomogram
Please refer to separate document

Queue Cluster 8 Phase I - Attachment 1
WDT 1278 – [redacted]
Interconnection Facilities, Network Upgrades, and Distribution Upgrades

Interconnection Facilities, Network Upgrades, and Distribution Upgrades [1]

To determine the cost responsibility of each generation project in QC8, 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 and Network Upgrades are listed below.

1. Interconnection Facilities.

(a) **Interconnection Customer's Interconnection Facilities.** The Interconnection Customer shall:

(i) Install a substation, referred to as ProjectSub in this document, with one [redacted] with a [redacted] impedance on a [redacted]

(ii) Install [redacted] conductor [redacted] from the Large Generating Facility to a position designated by the Distribution Provider's, outside of the Distribution Provider's ProjectSub Substation, where Interconnection Customer shall install a structure designed and engineered in accordance with the Distribution Provider's specifications ("Last Structure"). This [redacted] will be referred to as the ProjectSub –SCE W1278 [redacted] The right-of-way for the ProjectSub- SCE W1278 [redacted] shall extend up to the edge of the SCE W1278 Substation property line.
(Note: The ProjectSub- SCE W1278 [redacted] name is subject to change by the Distribution Provider's based upon its transmission line naming criteria. Should the ProjectSub -SCE W1278 [redacted] name be changed, this LGIA may be amended to reflect such change.)

(iii) The normal rating of the Interconnection Customer's [redacted]V equipment that is part of the [redacted] and the emergency rating is [redacted]

(iv) Install [redacted] on the ProjectSub -SCE W1278 [redacted] to a point designated by the Distribution Provider near the Distribution Provider's SCE W1278 Substation to provide one of two telecommunication paths required for the

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

line protection scheme, the Remote Terminal Units ("RTU"), and one of the two required telecommunication paths required for the SPS. A minimum of eight (8) strands within the ADSS fiber optic cable shall be provided for the Distribution Provider's exclusive use into SCE W1278 Substation.

(v) Install appropriate ADSS fiber optic cable from the Large Generating Facility to a point designated by the Distribution Provider near the Distribution Provider's SCE W1278 Substation to provide the second telecommunication path required for the line protection scheme and the SPS. A minimum of eight (8) strands within the ADSS fiber optic cable shall be provided for the Distribution Provider's exclusive use. The telecommunication path shall meet the Applicable Reliability Standards criteria for diversity.

(vi) Own, operate and maintain both telecommunication paths (including any fiber optic cables, and appurtenant facilities), with the exception of the terminal equipment at both ProjectSub Substation and at the Large Generating Facility, which terminal equipment will be installed, owned, operated and maintained by the Distribution Provider.

(vii) Allow the Distribution Provider to review the Interconnection Customer's telecommunication equipment design and perform inspections to ensure compatibility with the Distribution Provider's terminal equipment and protection engineering requirements; allow the Distribution Provider to perform acceptance testing of the telecommunication equipment and the right to request and/or to perform correction of installation deficiencies.

(viii) Provide required data signals, make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of the Distribution Provider's RTU in accordance with the Distribution Provider's Interconnection Handbook.

(ix) Make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of the Distribution Provider's telecommunications terminal equipment in accordance with the Distribution Provider's Interconnection Handbook.

(x) Extend the ADSS fiber optic cables for the two telecommunication paths to an Interconnection Customer provided and installed patch panel located adjacent to the Distribution Provider's telecommunications terminal equipment specified above.

(xi) Install all required CAISO-approved compliant metering equipment at the Large Generating Facility, in accordance with Section 10 of the CAISO Tariff.

(xii) Install a revenue metering cabinet and revenue metering equipment (typically, voltage and current transformers) at the Large Generating Facility to meter the Large Generating Facility retail load, as specified by the Distribution Provider. The metering cabinet must be placed at a location that would allow twenty-four hour access for the Distribution Provider's metering personnel.

(xiii) Allow the Distribution Provider to install, in the revenue metering cabinet provided by the Interconnection Customer, revenue meters and appurtenant equipment required to meter the retail load at the Large Generating Facility.

(xiv) Install relay protection to be specified by the Distribution Provider to match the relay protection used by the Distribution Provider at SCE W1278 Substation, in order to protect the ProjectSub -SCE W1278 [redacted] as follows:

(xv) Two (2) current differential relays connected via diversely routed dedicated digital communication channels to SCE W1278 Substation. The make and type of current differential relays will be specified by the Distribution Provider during detailed engineering of the Distribution Provider's Interconnection Facilities.

(xvi) Install all equipment necessary to comply with the power factor requirements of Article 9.6.1 of the GIA, including the ability to automatically regulate the power factor to a schedule (VAR schedule) in accordance with the Distribution Provider's Interconnection Handbook.

(xvii) Install disconnect facilities in accordance with the Distribution Provider's Interconnection Handbook to comply with the Distribution Provider's switching and tagging procedures.

(b) **Distribution Provider's Interconnection Facilities.** The Distribution Provider shall:

(i) **SCE W1278 Substation.**

A. Install facilities for a new [redacted] to terminate the ProjectSub -SCE W1278 [redacted] This work includes the following:

1. [redacted]
2. [redacted]
3. [redacted]

B. Install the following relays to protect the ProjectSub –SCE W1278 [redacted]

1. [redacted] connected via diversely routed dedicated digital communications channels to the Large Generating Facility.

(ii) **Generation Tie Line:** The Phase I Interconnection Study assumed one [redacted] between SCE W1278 Substation and the Facility.

(iii) **Telecommunications.**

A. Install all required lightwave, channel banks, and associated equipment (including terminal equipment), supporting protection and Supervisory Control and Data Acquisition (SCADA) requirements at the Large Generating Facility and SCE W1278 Substation for the interconnection of the Large Generating Facility. Notwithstanding that certain telecommunication equipment, including the telecommunications terminal equipment, will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Distribution Provider shall own, operate and maintain such telecommunication equipment as part of the Distribution Provider's Interconnection Facilities.

B. Install appropriate length of fiber optic cable, including conduit and vaults, from the point designated by the Distribution Provider near the Distribution Provider's SCE W1278 Substation to extend the ADSS fiber optic cable into the communication room at SCE W1278 Substation. The actual location and length of fiber optic cable and conduit, and location and number of vaults, will be determined during detailed engineering of the Distribution Provider's Interconnection Facilities.

C. Install appropriate length of fiber optic cable, including conduit and vaults, to extend the Interconnection Customer's diverse telecommunications from the point designated by the Distribution Provider near the Distribution Provider's SCE W1278 Substation into the communication room at SCE W1278 Substation. The actual location and length of fiber optic cable and conduit, and location and number of vaults, will be determined during detailed engineering of the Distribution Provider's Interconnection Facilities.

D. Install all additional required lightwave, channel banks, fiber optic cable, and associated equipment (including terminal equipment), supporting the SPS requirements. Notwithstanding that certain telecommunication equipment, including the telecommunications terminal equipment, will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Distribution Provider

shall own, operate and maintain such telecommunication equipment as part of the Distribution Provider's Interconnection Facilities.

(iv) **Real Properties, Permits, Licensing.**
Obtain easements and/or acquire land, obtain licensing and permits, and perform all required environmental activities for the installation of the Distribution Provider's Interconnection Facilities, including any associated telecommunication equipment for the ProjectSub-SCE W1278[redacted]

(v) **Metering.**
Install revenue meters and appurtenant equipment required to meter the retail load at the Large Generating Facility. Notwithstanding that the meters and appurtenant equipment will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Distribution Provider shall own, operate and maintain such facilities as part of the Distribution Provider's Interconnection Facilities.

(vi) **Power System Control.**
Install[redacted]at the Large Generating Facility to monitor typical generation elements such as MW, MVAR, terminal voltage and circuit breaker status for the Large Generating Facility and plant auxiliary load, and transmit the information received thereby to the Distribution Provider's grid control center. Notwithstanding that the[redacted]will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Distribution Provider shall own, operate and maintain the[redacted]as part of the Distribution Provider's Interconnection Facilities.

2. Network Upgrades.

(a) **Stand Alone Network Upgrades.**
None identified as part of the Phase I study.

(b) **Other Network Upgrades.**

(i) **Distribution Provider's Reliability Network Upgrades.**

A. [redacted]

[redacted]
Remove existing[redacted]associated control and test switches, and five (5) relay racks.

2. [redacted]
Remove existing HDPP SPS relays, associated control and test switches and two (2) relay racks.

[redacted]

a. [redacted] or equivalent successor, [redacted]

b. [redacted] Install [redacted] and send additional tripping signals to the generation project.

c. [redacted] and send additional tripping signals to the generation project.

Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

d. [redacted] **(Interconnection Facilities).** [redacted] to monitor lines and send additional tripping signals to the generation project.

Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

e. [redacted] **(Interconnection Facilities).** [redacted] to monitor lines and send additional tripping signals to the generation project.

Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

f. [redacted]

[redacted] and send additional tripping signals to the generation project.

g. [redacted] to send additional tripping signals to the generation project.

h. [redacted] to send additional tripping signals to the generation project.

Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

i. [redacted] to the generation project.

Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

j. **Telecommunication.**
   I. Remove telecommunication equipment associated with [redacted]
   II. Install required lighwave, channel banks, CRIAR and associated equipment (including terminal equipment) at [redacted]

   Note: Facilities at [redacted] are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

k. **Power System Controls (PSC).**
   I. Instal[redacted]
   II. Expand/upgrade the existing point lists at [redacted]
   III. Modify RTU/SPS program on EMS

   Note: Facilities at [redacted] are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

2. **Expand** [redacted]
   a. [redacted] to monitor lines and send additional tripping signals to the generation project.

      Note: These facilities are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

   b. [redacted] to monitor lines and send additional tripping signals to the generation project.

   c. **Telecommunication.**
      Install required lighwave, channel banks, CRIAR and associated equipment (including terminal equipment), supporting the expansion of Mojave SPS requirements.

      Note: Facilities at [redacted] are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

   d. **Power System Controls (PSC).**
      I. Expand/upgrade the existing point lists at [redacted] to support the existing SPS.
      II. Modify RTU/SPS program on EMS

      Note: Facilities at Sandlot Substation are classified as interconnection facilities but are included here to keep the full scope of the project in one section.

(ii) **Distribution Provider's Delivery Network Upgrades.**
The Distribution Provider shall:

1. **Area Delivery Network Upgrades.**

A. [redacted]

a. Transmission

I. Install 34 miles of [redacted]

II. Tear down [redacted]

III. Rebuild [redacted]

b. Substation

[redacted]

c. [redacted] as required

B. [redacted]

a. Transmission

I. Relocate existing [redacted]

II. Relocate existing [redacted]

b. [redacted]

I. Expand [redacted]

II. Equip [redacted]

III. Remove [redacted]

IV. Equip [redacted]

[redacted]

I. Install [redacted]

II. Install [redacted]

III. Install [redacted]

IV. Install [redacted]

V. Equip [redacted]

VI. Expand [redacted]

VII. Expand [redacted]

Transformer Bank

I. Install [redacted]

Mechanical Electrical Equipment Room (MEER)

[redacted]

c. Power System Controls

I. Reprogram/revise RTU & EMS at [redacted] to add additional transformer bank monitoring & bank protection points.

d. Telecommunications

I. Install telecommunication equipment needed to support transformer bank installation.

e. Real Properties, Transmission Project Licensing, and Corporate Environmental Health and Safety

I. Perform all required environmental activities for the installation of the project elements described above.

2. **Local Delivery Network Upgrades.**
None identified in the Phase I Interconnection Study.

3. Distribution Upgrades.

The Distribution Provider will design, install, own, operate and maintain the following elements:

(i) **WDT1278 Plan of Service Distribution Upgrade**

A. [redacted]

SCE W1278 to the [redacted] Install an appropriate number of [redacted] including insulator/hardware assemblies, and appropriate number of spans of conductor between the Last Structure and the dead-end substation structure at SCE W1278 Substation. The actual number and location of the transmission tower structures and spans of conductor will be determined by the Distribution Provider following completion of detailed engineering of the Distribution Provider's Interconnection Facilities. The

Phase I Interconnection Study assumed [redacted]

B. **Substations:**

1. **SCE W1278 Substation**

The SCE W1278 substation will consist of [redacted] with the following equipment.

a. [redacted]

b. [redacted]

c. [redacted]

d. [redacted]

e. MEER:

[redacted]

2. [redacted]
One [redacted]

3. [redacted]
One [redacted]

4. [redacted]
One [redacted]

C. **Power System Control:**
Install all necessary equipment, including [redacted] to monitor: the typical bulk power elements such as MW, MVAR and phase amps at each line; kV at lines and buses; and circuit breaker status/control, protection relays status and alarms.

(ii) **Real Properties, Permits, Licensing.**

Obtain easements and/or acquire land, obtain licensing and permits, and perform all required environmental activities for the installation of the Distribution Provider's Distribution Upgrades, including any associated telecommunication equipment.

(iii) **Short Circuit Duty (SCD) Mitigation – DU.**
None identified in the Phase I Interconnection Study.

4. **Affected System Upgrades.**
Not Used

5. **Point of Change of Ownership.**

(a) ProjectSub -SCE W1278[redacted] The Point of Change of Ownership shall be the point where the conductors of the ProjectSub -SCE 1278[redacted] are attached to the Last Structure, which will be connected on the side of the Last Structure facing SCE W1278 Substation. The Interconnection Customer shall own and maintain the Last Structure, the conductors, insulators and jumper loops from such Last Structure to the Interconnection Customer's Large Generating Facility. The Distribution Provider will own and maintain the SCE W1278 Substation, as well as all circuit breakers, disconnects, relay facilities and metering within the SCE W1278 Substation, together with the line drop, in their entirety, from the Last Structure to SCE W1278 Substation. The Distribution Provider will own the insulators that are used to attach the Distribution Provider-owned conductors to the Last Structure.

(b) Telecommunication ADSS fiber optic cable: The Point of Change of Ownership shall be at a Distribution Provider-owned vault outside of SCE W1278 Substation perimeter wall where the Interconnection Customer's ADSS fiber optic cable for the ProjectSub -SCE W1278[redacted] is connected to the Distribution Provider's fiber optic cable. The Distribution Provider shall own and maintain all fiber optic cable from that point into the SCE W1278 Substation.

(c) Telecommunication Diverse Fiber optic Cable: The Point of Change of Ownership shall be at a Distribution Provider-owned vault outside of the SCE W1278 Substation perimeter wall where the Interconnection Customer's fiber optic cable is connected to the Distribution Provider's fiber optic cable. The Distribution Provider shall own and maintain all fiber optic cable from that point into the SCE W1278 Substation.

6. **Point of Interconnection.** The Distribution Provider's SCE W1278[redacted]

7. One-Line Diagram of Interconnection to SCE W1278 [redacted]