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Facilities Study Report

August 13, 2012

SOUTHERN CALIFORNIA
EDISON
An *EDISON INTERNATIONAL*SM Company

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SOUTHERN CALIFORNIA EDISON COMPANY

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1. Attachment A –System Impact Study

1. Executive Summary

On August 17, 2009, the Southern California Edison Company ("SCE") received an Interconnection Request from [redacted] ("Interconnection Customer" or "IC") for its proposed [redacted] ("Project") under the terms of SCE's Wholesale Distribution Access Tariff ("WDAT"). The Project is a proposed 20 MW energy only solar photovoltaic generator that would receive interconnection service from an existing SCE 33 kV distribution circuit ("Mc Coy 33kV") out of SCE's [redacted] 161/33 kV Substation. The generated power would be delivered to the California Independent System Operator ("CAISO") grid at the 161 kV bus of SCE's [redacted] 161/33 kV Substation. The Interconnection Customer's targeted Commercial Operation Date for the Project is [redacted]

The Interconnection Customer also submitted an additional Interconnection Request for the Project to have Full Capacity Deliverability Status pursuant to Section 4.7.1 of the Generator Interconnection Procedures. The Project's Full Capacity Deliverability Status is currently being evaluating as part of the CAISO Cluster 4 One-Time Deliverability Assessment and is the subject of a separate study agreement between SCE and the Interconnection Customer dated August 8, 2011. The results of the One-Time Deliverability Assessment and the incremental upgrades associated therewith are not included in this Facilities Study Report and will be provided to the Interconnection Customer in a subsequent report that is expected to be completed later this year.

The report provides the following:

1. Summary of the Transmission and Distribution System impacts which were identified during the System Impact Study.

2. Summary of the Transmission and Distribution System upgrades necessary to mitigate those impacts identified in the System Impact Study.

3. The Interconnection Facilities required to interconnect the proposed Project to the Distribution System.

4. A non-binding, good faith cost estimate for the identified Distribution Upgrades and Interconnection Facilities.

5. A non-binding time estimate to design, procure and construct the identified Distribution Upgrades and Interconnection Facilities.

The System Impact Study was performed to determine the impacts on the Transmission and Distribution system for which mitigation plans may have been proposed for the Project. Mitigation plans for the Project are detailed in the System Impact Study report dated November 10, 2011 (Attachment A).

[1] Date as requested in Attachment A to the Facilities Study Agreement submitted to SCE on 3/14/2012 . Actual operating date depends on design, procurement, and construction requirements. The Interconnection Studies will ultimately determine the targeted in-service date for the SCE facilities.

The non-binding SCE cost estimates[2] to interconnect and provide distribution service for the Project are:

Interconnection Facilities[3]	**$1.345 M**
Interconnection Facilities ITCC[4]	**$0.471 M**
Distribution Upgrades	**$0.290 M**
Distribution Upgrades ITCC[4]	**$0.101 M**

The estimated costs have been provided in 2012 constant dollars. Section 6 of this report provides further detail of the estimated costs.

The non-binding schedule to license, engineer, procure, and construct the Interconnection Facilities and Distribution Upgrades is approximately 12 months from the execution of the Small Generator Interconnection Agreement (SGIA) and from SCE specified milestones associated with the IC's responsibilities.

[2] These upgrades are not reimbursable to the IC.

[3] The electrical facilities installed and maintained by SCE necessary to physically and electrically interconnect the Project to the SCE Distribution System from the Point of Change in Ownership to the Point of Interconnection.

[4] Income Tax Component of Contribution. The ITCC included in this cost estimate was computed using a 35% rate.

2. System Impact Study Executive Summaries

For additional details on system impacts and proposed mitigation, please refer to Attachment A.

A. Transmission Planning:

- Based on the Study results, the existing SCE transmission facilities are not adequate to accommodate the [redacted] and ALL queued ahead generation projects.
- However, increased loadings that may result in increased special protection system ("SPS") action would be addressed by the CAISO's implementation of appropriate congestion management protocols thereby addressing all impacts attributed to the addition of the [redacted]
- The System Impact Study found that the addition of the Project did not trigger the need for any transmission network upgrades for power flow, post-transient, or transient stability impacts.
- The results showed that the addition of the [redacted] does not increase short circuit dity ("SCD") and contributes no SCD impact on the SCE transmission system.

B. Distribution Engineering:

- For both peak load and light load conditions, the addition of the [redacted] resulted in violations of SCE's thermal loading criteria under base case conditions for the SCE distribution system. However no violations were found under N-1 conditions.
- The original proposed Point of Interconnection was changed from the Chanslor 33kV line to the Mc Coy 33kV line as a way to mitigate an overload issue. Details of the overload are explained in the Thermal Loading section of the System Impact Study report.
- The addition of the [redacted] resulted in a voltage rise not exceeding the allowable Rule 2 limits.
- The addition of the [redacted] resulted in the increase of three-phase short-circuit duties of 0.1kA o[redacted] distribution substations. The circuit breaker interrupting capabilities were reviewed at these substations and it was determined that [redacted] circuit breakers will be required to be upgraded.

3. Facilities Study Assumptions

The following assumptions are specific to the Project.

A. The following SCE Distribution System Design Criteria were included in the Facility Study:

- The new distribution system pole line will be on Riverside Dr. between the Project and Buck Avenue.
- The engineering, design, procurement, and construction of the electrical facilities will take approximately 12 months. The Interconnection Customer is responsible to perform the underground civil work, if required, per SCE's design.
- SCE will approve and release the applicant installed underground infrastructure, if any, prior to SCE initiating the construction of the electrical facilities.
- The underground civil work, if required, includes but it is not limited to excavation (all necessary trenching, backfilling, and other digging as required), and installation of conduits and vaults for the required interconnection facilities
- Where formal rights of way, easements, land leases, or permits are required by SCE for installation of its facilities, on or over the IC's property, or the property of others, the IC shall grant, or cause to be granted, SCE the rights of way and easements for the electrical facilities.
- Current distribution standards are being updated to address solar photovoltaic generation interconnection systems. Accordingly, the proposed method of service in this report may change based on final design to comply with any updated distribution design standards.

B. The following facilities are to be installed by the Interconnection Customer and are not included in this Facilities Study:

- Ducts
- Underground Structures
- Point of Interconnection Breaker
- CAISO metering as required
- Protection Systems required to comply with SCE Interconnection requirements
- Transformation as required

4. Facilities Study Scope

Case A: The facilities that are triggered by the addition of the [redacted] and are required exclusively by the [redacted] for interconnection and distribution service.

And

Case B: The facilities that are triggered by projects queued ahead of the [redacted] but may be required by the [redacted] as a result of a change in the interconnection queue, or may need to be advanced by the [redacted] based on results of operating studies.

Case A:

SCE'S INTERCONNECTION FACILITIES

1. **Distribution:**
   - Install approximately 4600 feet of 653ACSR new overhead conductor and associated poles and hardware.
   - Install [redacted] 33kV Remote Automatic Recloser
   - Install [redacted] overhead pole switch

- Install pole mounted 33kV primary metering, current transformers, potential transformers, and associated wiring

2. **Telecommunications**
   - Install Telecommunication equipment to support the Remote Terminal Unit ("RTU").

   The IC shall make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of SCE's telecommunications terminal equipment in accordance with the Interconnection Handbook.[5]

   It is assumed that the local telecommunications company will provide a T1 service from the Project's location to the appropriate SCE facility location, as determined by SCE. The IC is responsible for initiating and maintaining the T1 service with the local telecommunications company. If the local telecommunications company cannot provide T1 line service, then the cost for telecommunications may increase beyond the cost provided in this report.

3. **Metering Services Organization**
   - Install a revenue metering cabinet and the SCE revenue meters required to meter the retail load at the generating facility.

   The SCE retail meter can be installed in tandem with the CAISO meter circuit if requested by the IC.

4. **Power System Control**
   - Instal[redacted]at the generating facility to monitor Watts and VAR flow from the generation facility to SCEs distribution system as well as other customer status including breaker status and bus voltage.

   The IC shall make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of SCE's RTU, and provide required data signals in accordance with SCE's Interconnection Handbook.[6]

5. **Real Properties**
   It is assumed that, where applicable, the IC will provide all rights of way and easements satisfactory for installation of SCE Interconnection Facilities without cost to SCE.

6. **Corporate Environmental Health & Safety Organization**
   For SCE's Interconnection Facilities and scope of work not subject to CPUC's GO 131-D, SCE will follow the requirements of all applicable environmental laws and regulations and issue an in-house Environmental Clearance before commencement of construction activities. The cost estimates provided for this scope of work assume the following:

   Biological Resources

[5] The Interconnection Handbook can be downloaded at: http://www.sce.com/AboutSCE/Regulatory/openaccess/.

The Interconnection Customer will assume responsibility for the following tasks for the [redacted] which includes the new tap line:

1. Conducting surveys and analyses for, and preparation of biotechnical report(s) (with SCE review)
2. Performing and reporting necessary protocol or focused wildlife or plant survey as deemed necessary (with SCE review)
3. Performing jurisdictional delineations and preparing applications for SCE processing of permits as deemed necessary (with SCE review)
4. Providing biological monitoring and pre-construction surveys throughout the progress of the project as deemed necessary (with SCE review)
5. Performing any additional analyses in support of the national Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA)

Please note:
This cost estimate does not include long-term monitoring of rare plant mitigation that may be required under a mitigation and monitoring plan.

This cost estimate does not include any mitigation as required by a mitigation and monitoring plan (such as desert tortoise fencing, burrowing owl relocation plans, noxious weed control, revegetation, etc.).

This cost estimate assumes the customer will be responsible for all environmental tasks associated with the new tap line.

Cultural Resources
This cost estimate assumes the Interconnection Customer will assume responsibility for the following tasks for the [redacted] which includes the new tap line:

1. Performing cultural resources records and paleontological resources literature/locality searches
2. Performing cultural resources survey and site recording
3. Performing site testing and evaluation (if needed)
4. Developing cultural and paleontological study reports
5. Providing cultural and paleontological resource monitoring throughout the progress of the project as deemed necessary (with SCE review)
6. Performing any additional analyses in support of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA)

DISTRIBUTION UPGRADES

1. **Distribution**
   - Install [redacted] 33kV Remote Automatic Recloser on the Mc Coy 33kV line
   - Reconductor approximately 200 feet of 1/0 ACSR to 653 ACSR

2. **Sub-Transmission**
   - None

3. **Substation**

- Instal[redacted]3 Phase bi-directional Line Watt Transducer at SCE's[redacted] 161/3kV Substation

4. **Real Properties**

It is assumed that, where applicable, the IC will provide all rights of way, and easements satisfactory for installation of SCE's Distribution Upgrades without cost to SCE.

5. **Corporate Environmental Health & Safety Organization**

For SCE Distribution Upgrades and scope of work not subject to CPUC's GO 131-D, SCE will follow the requirements of all applicable environmental laws and regulations and issue an in-house Environmental Clearance before commencement of construction activities. The cost estimates provided assume the following:

Biological Resources

The Interconnection Customer will assume responsibility for the following tasks for the [redacted] which includes the new Remote Automatic Recloser and reconductor:

1. Conducting surveys and analyses for, and preparation of biotechnical report(s) (with SCE review)
2. Performing and reporting necessary protocol or focused wildlife or plant survey as deemed necessary (with SCE review)
3. Performing jurisdictional delineations and preparing applications for SCE processing of permits as deemed necessary (with SCE review)
4. Providing biological monitoring and pre-construction surveys throughout the progress of the project as deemed necessary (with SCE review)
5. Performing any additional analyses in support of the national Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA)

Please note:
This cost estimate does not include long-term monitoring of rare plant mitigation that may be required under a mitigation and monitoring plan.

This cost estimate does not include any mitigation as required by a mitigation and monitoring plan (such as desert tortoise fencing, burrowing owl relocation plans, noxious weed control, revegetation, etc.).

This cost estimate assumes the customer will be responsible for all environmental tasks associated with the new Remote Automatic Recloser and reconductor.

Cultural Resources
This cost estimate assumes the Interconnection Customer will assume responsibility for the following tasks for the [redacted] which includes the new Remote Automatic Recloser and reconductor:

1. Performing cultural resources records and paleontological resources literature/locality searches
2. Performing cultural resources survey and site recording
3. Performing site testing and evaluation (if needed)
4. Developing cultural and paleontological study reports
5. Providing cultural and paleontological resource monitoring throughout the progress of the project as deemed necessary (with SCE review)
6. Performing any additional analyses in support of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA)

Case B:
No Case B facilities have been identified at this time.

5. Facility Study Cost Estimates

The total estimated cost of all elements of the interconnection as identified above in the Interconnection Facilities Study Scope is as follows:

Case A:	$1.635 M
ITCC:	$0.572 M
Case B:	$ 0 M
TOTAL:	$2.207 M

6. Facility Study Summary

6.1 Cost Estimates

The non-binding order of magnitude cost estimates for the required Interconnection Facilities and Distribution Upgrades are are shown below. These costs do not include costs for any civil construction which may be required to install SCE's Interconnection Facilities and Distribution Upgrades. Such civil construction, where applicable, is assumed to be performed by the Interconnection Customer.

SCE's Distribution Upgrades

Distribution Upgrades $0.242 M[7]

- Reconductor approximately 200 feet of 1/0 ACSR to 653 ACSR.
- Install [redacted] Remote Automatic Recloser on the Mc Coy 33kV line.
- Install [redacted] Phase bi-directional Line Watt Transducer at SCE's Blythe 161/3kV Substation.

[7] Cost estimates does not include 35% ITCC. Cost estimates are in 2012 dollars.

Environmental Health and Safety

Distribution Upgrades $0.048 M[7]

- Oversite for documents related to customer's licensing, permitting, and all required environmental activities for the construction of Distribution Upgrades on the Mc Coy 33 kV line.

SCE's Interconnection Facilities

Interconnection Facilities $0.668 M[7]

- Install approximately 4,600 feet of new 653 ACSR overhead conductor and associated poles and hardware.
- Install [redacted] 33 kV Remote Automatic Recloser
- Install [redacted] 33kV overhead pole switch
- Installation of pole mounted 33kV primary metering equipment

Telemetry $0.157 M[7]

- Power System Controls – Install [redacted] RTU and program data points
- Telecommunications – Install telecom equipment to support the RTU

Environmental Health and Safety

Interconnection Facilities $0.520 M[7]

- Oversite for documents related to customer's licensing, permiting, and all required environmental activities for the construction of Interconnection Facilities on the Mc Coy 33 kV line.

35% ITCC $0.572 M

Total non-binding order of magnitude cost estimate $2.207 M

6.2 Design Schedule Estimates

Once the SGIA is executed, the design of the Interconnection Facilities and Distribution Upgrades will take approximately 6 months from the time the Interconnection Customer has provided the following to SCE:

- *Customer information sheet.*
- *Street improvement plans (if available)*
- *Unique address for point of interconnection*
- *Site plot plan on a 30:1 scale or digital file required*
  - *Easements/Lease Agreement*
  - *Grading plans – if project area is not graded*
  - *Sewer and storm plot plans – if facilities are existing at the project location*
  - *Landscape, sprinkler, pedestal locations – if facilities are existing at the project location.*

6.3 Construction Schedule Estimates

The construction of the Interconnection Facilities and Distribution Upgrades will take approximately 6 months from the time the design is complete and from the time the underground civil construction, if any, has been completed by Interconnection Customer and released by SCE inspectors. This assumes that any transmission network, subtransmission, and distribution upgrades triggered by higher queued projects that are required for the Project to interconnect has been constructed and are placed in service.

6.4 Conceptual Method 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 during the actual design and construction of the project

6.5 Relocations and Other Use of SCE Facilities

The Interconnection Customer is responsible for all costs associated with necessary relocation of any SCE facilities as a result of this project and acquiring all property rights necessary for the Interconnection Customer's Interconnection Facilities, including those required to cross SCE facilities and property. The relocation of SCE facilities or use of SCE property rights shall only be permitted upon written agreement between SCE and the Interconnection Customer. Any proposed relocation of SCE facilities or use of SCE property rights may require a separate study and/or evaluation to determine whether such use may be accommodated, and any associated cost would be non-refundable.

6.6 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.

6.7 System Protection Coordination

The Interconnection Customer will be required to install a relay with adequate elements into the applicant's relay protection scheme per SCE's Interconnection Handbook.

6.8 Construction Schedule

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.

6.9 Deliverability Status

In addition to this Facility Study which evaluated the Project as Energy Only Deliverability Staus, the Interconnection Customer has also submitted an additional Interconnection Request for the Project to have Full Capacity Deliverability Status pursuant to Section 4.7.1 of the Generator Interconnection Procedures. The Project's Full Capacity Deliverability Status is currently being evaluating as part of the CAISO Cluster 4 One-Time Deliverability Assessment and is the subject of a separate study agreement between SCE and the Interconnection Customer dated August 8, 2011. The results of the One-Time Deliverability Assessment and any incremental upgrades associated therewith are not included in this Facilities Study Report and will be provided to the Interconnection Customer in a subsequent report that is expected to be completed later this year.

ATTACHMENT A

System Impact Study