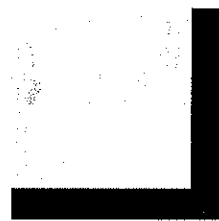


[REDACTED]

GENERATION TIE LINES STUDY REPORT
and
FACILITIES STUDY REPORT

December 27, 2013



SOUTHERN CALIFORNIA

EDISON

An *EDISON INTERNATIONAL*SM Company

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Confidential: Contains Critical Energy Infrastructure Information (CEII)

Table of Contents

	Description	Page
I.	Executive Summary.....	3
II.	Power Flow and Short Circuit Duty Reassessment Results.....	3
III.	Generation Tie Lines and Facilities Studies Assumptions.....	5
IV.	Generation Tie Lines Study Scope.....	5
V.	Facilities Study Scope.....	6
VI.	Cost Estimate.....	7
VII.	Conclusions.....	8
Exhibits		
Exhibit A	Power Flow and Short Circuit Duty Reassessment – Executive Summary and Application Queue (Appendix C)	
Exhibit B	Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines	
Exhibit C	Valley Substation 115kV Switchyard – Year 2018 Configuration	
Exhibit D	Diverse – Path Telecommunications Fiber Optic Channels	
Exhibit E	Generation Tie Lines Study and Facilities Study Scopes – Details	
Exhibit F	Cost Summaries	

I. Executive Summary

[REDACTED] applied to the Southern California Edison Company (SCE) for the interconnection of 507.5MW of generation from their [REDACTED] to the SCE 115kV Sub – Transmission System under the terms of SCE's Wholesale Distribution Access Tariff (WDAT).

The Project will be connected to the Valley Substation 115kV Open Air Bus via two radial SCE owned 115kV Gen Tie Lines addressed within this study as the [REDACTED] No.1 and No.2 115kV Gen Tie Lines.

The Point of Interconnection to the California Independent System Operator (CAISO) Grid would be the Valley Substation 500kV Bus.

SCE had originally prepared a System Impact Study Report to [REDACTED] on November 29, 2005 and the corresponding Facilities Study on October 6, 2006.

Due to changes on the Application Queue, SCE prepared several Re-Studies between 2006 and 2011.

However, since 2011, several additional queued – ahead projects have withdrawn their requests from the Application Queue and, in addition, the CAISO has modified the import assumptions to be considered on future interconnection studies.

For these reasons, SCE has issued a new Power Flow and Short Circuit Duty Reassessment, dated October 10, 2012, based on the most current Application Queue and the latest CAISO approved study assumptions.

The new Power Flow and Short Circuit Duty Reassessment recommended that a Facilities Study be prepared to provide scope and cost estimates for the SCE facilities required to interconnect the Project to the SCE System.

In addition, [REDACTED] requested SCE to prepare a separate Gen Tie Lines Study to provide scope and cost estimates for SCE to install the proposed Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines and all related elements.

[REDACTED] has requested an In-Service Date of December 31, 2018. At this time, SCE estimates that the installation of all the SCE facilities required to connect the Project to the Valley Substation 115kV Bus would require a minimum of 36 months after all the required interconnection agreements between SCE and [REDACTED] have been executed.

This Report will assume, for the exclusive purpose of escalating the cost estimates and not to commit SCE to a specific date to complete the Project, that the interconnection will be completed by the requested date of December 31, 2018.

II. Power Flow and Short Circuit Duty Reassessment Results

The Power Flow and Short Circuit Duty Reassessment analyzed the System under the following conditions:

1. All interconnections within the SCE Eastern Area addressed on the Application Queue shown on Exhibit A (Appendix C) are on line.
2. Alberhill Substation and consequent re-configuration of the Valley – Serrano 500kV T/L into the two new Alberhill – Valley and Alberhill – Serrano 500kV TL's on line.

3. Devers - Mirage 115kV System split into two separate Devers 115kV System and Mirage 115kV System in place

4.1 West of Devers Interim Upgrade in service.

The West of Devers Interim Upgrade includes the temporary installation of [REDACTED] under contingencies created by outages on any of these four 220kV T/L's.

4.2 West of Devers Permanent Upgrade in service.

The West of Devers Permanent Upgrade includes the upgrades of the Devers – El Casco, Devers – San Bernardino, El Casco – San Bernardino and Devers – Vista Nos. [REDACTED], and the required upgrades of the substations terminal equipment to support the upgraded line ratings.

The Power Flow and Short Circuit Duty Reassessment analyzed the two possible conditions related to the West of Devers 220kV Transmission System:

Configuration 1: West of Devers Final Upgrade in place.

[REDACTED]

Configuration 2: West of Devers Interim Upgrade in place.

[REDACTED]

In addition the Project requires the [REDACTED] under the single contingency caused by the outage of either the Alberhill – Serrano or the Alberhill – Valley 500kV Transmission Lines to eliminate overloads on the existing West of Devers 220kV T/L's.

NOTES (For Information Only – Not part of this Report):

a. The West of Devers Final Upgrade consists of the replacement of all line conductors on the Devers – Vista No.1 and No.2, Devers – El Casco and Devers – San Bernardino 220kV T/L's with [REDACTED] and the upgrade of all Substations Line Positions as required to make them compatible with the upgraded line ratings.

[REDACTED] The West of Devers Interim Upgrade consists of the [REDACTED]

These line reactors will be removed after the final upgrade is completed.

The Power Flow and Short Circuit Duty Reassessment concluded that a Facilities Study is required to provide scope of work and cost estimates for the facilities required to interconnect the Project plus the upgrade of the Alberhill 500kV Line Position at Serrano Substation to [REDACTED] and the installation of [REDACTED] that will be active while the West of Devers 220kV Interim Upgrade is in place.

After the West of Devers Final Upgrade is completed the system will be re-evaluated to determine whether the SPS would still be required.

[REDACTED]

GENERATION TIE LINES STUDY AND FACILITIES STUDY REPORT

The Power Flow and Short Circuit Duty Reassessment concluded that the existing SCE Projects addressing Circuit Breaker Replacements and / or Upgrades, which are presently in progress and scheduled to be completed prior to the interconnection of the Project, would result in all circuit breakers being adequate to support the new generation and, therefore, the Project does not require any additional circuit breakers replacements or upgrades.

SEE EXHIBIT A: POWER FLOW AND SHORT CIRCUIT DUTY REASSESSMENT – EXECUTIVE SUMMARY AND APPLICATION QUEUE (Appendix C)

III. Generation Tie Lines and Facilities Studies Assumptions

The following equipment will be installed by [REDACTED] at the generating Facility and is not included within this Facilities Study:

- All required ISO metering equipment at the Generating Facility.

NOTE: [REDACTED] will allow SCE the use of secondary circuits from the metering equipment (Voltage and Current Transformers) to feed the SCE owned retail Load Revenue Meters.

The Revenue Meters will be installed inside an SCE owned Metering Panel and [REDACTED] will grant SCE continuous access to the Metering Panel.

[REDACTED]

[REDACTED]

In addition:

This Facilities Study assumes that [REDACTED] would include within their Licensing Process and environmental studies the description of the following SCE facilities required for the interconnection of the Project and incorporate such studies into its CEQA documents:

- Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines.
- Two diverse-path Valley – [REDACTED] Fiber Optic Channels.
- Relocations of the last few spans of the Valley – Elsinore – Fogarty 115kV Lines terminating at the south area of Valley Substation.

This Facilities Study includes exclusively the SCE costs required to review the [REDACTED] Studies and does not include the cost of the Licensing effort and studies to be performed by [REDACTED].

IV. Gen Tie Lines Study Scope

The following facilities will be installed by SCE to support the Project:

- **Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines:**
Install approximately 1,800 Ft. of Double Circuit 115kV line equipped with [REDACTED] between the [REDACTED] Generating Facility and the Valley Substation 115kV Switchyard and terminate the lines at the existing Positions 1X-S and 1-S.

[REDACTED]

GENERATION TIE LINES STUDY AND FACILITIES STUDY REPORT

- **Information Technology:**
Install Communications Terminal Equipment at the Valley Substation and the Generating Facility to support the Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines Protection Scheme.
- **Edison Carrier Solutions:**
Install one of two diverse path Fiber Optic Channels between the Valley Substation and the [REDACTED] Generating Facility to support the Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines Protection Scheme. This channel will be referred to as Path 1.
- **Real Properties:**
Perform all activities required to support the installation of the Valley – [REDACTED] Nos.1 and No.2 115kV Gen Tie Lines and the new Path 1 Valley – [REDACTED] Fiber Optic Channel.
- **Corporate Environmental Services:**
Provide all required functions to support the Licensing Process to be performed by [REDACTED] related to the installation of the Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines and the new Path 1 Valley – [REDACTED] Fiber Optic Channel.

V. Facilities Study Scope

The following facilities will be installed by SCE to support the Project:

- **Valley – Elsinore – Fogarty 115kV Line:**
Relocate the line termination at Valley Substation from [REDACTED] to [REDACTED].
- **Valley Substation – 115kV Switchyard:**
Equip existing Position [REDACTED] with two circuit breakers to terminate the relocated Elsinore – Fogarty 115kV Line
Equip existing Position [REDACTED] with two circuit breakers to terminate the [REDACTED] No.2 115kV Gen Tie Line.
Remove one circuit breaker and associated disconnect switches from the existing Position 1 to reconfigure it as a Double Breaker Line Position to terminate the [REDACTED] No.1 115kV Gen Tie Line.
Also [REDACTED] on the Alberhill 500kV Line Position for the SPS.
- **Serrano Substation – 500kV GIS and Open Air Equipment:**
Upgrade the existing [REDACTED] Alberhill 500kV Line Position to [REDACTED].
Also install monitoring relays on the Alberhill 500kV Line Position for the SPS.
- **Alberhill Substation – 500kV GIS and Open Air Equipment:**
Install monitoring relays on the Valley and Serrano 500kV Line Positions for the SPS.
- **Special Protection System (SPS):**
Install a SPS to trip all [REDACTED] Generation under either one of the single contingencies caused by the outages of the Alberhill – Serrano or the Alberhill – Valley 500kV T/L's to eliminate contingency overloads on the West of Devers 220kV System.
- **Information Technology:**
Install Communications Terminal Equipment at the Valley and Serrano Substations and the Generating Facility to support the SPS and the Generating Facility RTU.

[REDACTED]

GENERATION TIE LINES STUDY AND FACILITIES STUDY REPORT

- **Edison Carrier Solutions:**
Install the remaining of the two diverse path Fiber Optic Channels between the Valley Substation and the [REDACTED] Generating Facility to support the SPS and also support the Generation RTU. This channel will be referred to as Path 2.
- **Metering Services:**
Install Retail Load Meters at the Generating Facility.
- **Power System Controls:**
Install new RTU at the Generating Facility and upgrade the existing RTU at Valley Substation to add control and monitoring of the new 115kV Circuit Breakers and support the new SPS Relays.
Upgrade existing RTU's at Alberhill and Serrano Substation to support the new SPS Relays.
Also install two SPS Twin RTU's at Valley Substation.
- **Real Properties:**
Perform all activities required to support the installation of the new Path 2 Valley – [REDACTED] Fiber Optic Channel.
Also obtain easements for SCE access to the RTU installed at the Generating Facility.
- **Corporate Environmental Services:**
Provide all required functions to support the Licensing Process to be performed by [REDACTED] related to the installation of the Path 2 Valley – [REDACTED] Fiber Optic Channel.
Also provide any activities to support the reconfiguration and additions to the Valley 115kV Switchyard required for the installation of the two new [REDACTED] No.1 and No.2 115kV Gen Tie Line Positions and the relocation of the existing Elsinore – Fogarty 115kV Line Position.

FOR ADDITIONAL DETAIL SEE THE FOLLOWING EXHIBITS:

- **EXHIBIT B: VALLEY – [REDACTED] No.1 AND No.2 115kV GEN TIE LINES**
- **EXHIBIT C: VALLEY SUBSTATION 115kV SWITCHYARD YEAR 2018 CONFIGURATION**
- **EXHIBIT D: DIVERSE – PATH TELECOMMUNICATIONS FIBER OPTIC CHANNELS**
- **EXHIBIT E: GENERATION TIE LINES STUDY AND FACILITIES STUDY SCOPES – DETAILS**

VI. Cost Estimates

The cost of all elements of the Gen Tie Line Study addressed on Item IV of this Report is **\$6,503,754**

The cost of all elements of the Facilities Study addressed on Item V of this Report is **\$16,073,108**

The Total Cost is \$22,576,862

SEE EXHIBIT F: COST SUMMARIES

VI. Conclusions

- A. The estimated total cost for the Interconnection is \$22,576,862 with \$6,503,754 allocated to the installation of the Valley – [REDACTED] No.1 and No.2 115kV Gen Tie Lines and \$16,073,108 allocated to the remaining elements required to interconnect the Project to Valley Substation 115kV Bus and install all required System Upgrades.
- B. The estimated time required to complete the proposed project will be 36 months after receiving project authorization and funding. This time frame includes engineering, material procurement and construction and it is subject to availability of SCE resources.
- C. The costs indicated in the attached tables are shown 2018 Dollars and are not firm. These are only preliminary estimates based on conceptual engineering and system unit costs, and are subject to change based on the final design and actual material costs. This Facilities Study and cost estimates as presented are valid for a period of 150 days.
- D. The estimated Project Cost will be reconciled to actual costs upon closure of the subject work orders. The necessary billing adjustments will be made at that time.