

Facilities Study Addendum to the September 14, 2012 Facilities Study



SOUTHERN CALIFORNIA
EDISON

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October 21, 2013

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Southern California Edison



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I. Executive Summary

[REDACTED] applied to Southern California Edison ("SCE") for distribution service under the terms of SCE's Wholesale Distribution Access Tariff ("WDAT"). [REDACTED] will own and operate a 20 MW photovoltaic solar power project, [REDACTED] to be constructed by [REDACTED]. The [REDACTED] power plant is to be located in Mojave, CA, with the project site located approximately [REDACTED]. [REDACTED] proposes to interconnect to Windhub 66 kV Substation.

This report is an addendum to the original Facilities Study dated September 14, 2012 ("Original Facilities Study") and incorporates the results of the Subtransmission System Technical Assessment dated January 4, 2013. The proposed method of service under such studies involves the interconnection of the Project to the Windhub 66 kV Substation via a customer owned and built generation tie line.

II. Facilities Study Addendum Scope

This Facilities Study Addendum incorporates the scope of work and the cost estimate for the following work required for the interconnection (all other assumptions and scope stated in the Original Facilities Study dated September 14, 2012 and Updated Queue Analysis Subtransmission Technical Assessment dated January 4, 2013 not related to the following remain the same):

1. Addition of Project to the Windhub A-bank Special Protection Scheme (SPS)
2. Revised Corporate Environmental Health and Safety and Real Property scopes and estimates.

The following sections of the Original Facilities Study are replaced as follows:

1. The Power Flow subsection of Section II is replaced in its entirety as follows:

Power Flow – The Project did not trigger new base case overloads requiring distribution or transmission level mitigations.

2. Section II is replaced in its entirety as follows:

III. Subtransmission System Technical Assessment Results

Power Flow – Pursuant to the Subtransmission System Technical Assessment dated January 4, 2013, the Project is required to participate in the Windhub A-bank SPS.

3. Sections V and VI are replaced in their entirety as follows:

V. Facilities Study Scope and Cost Estimate

Pursuant to FERC's orders 2006-A (Small Generators) and 2003-A (Large Generators) all Facilities Studies are required to provide the customer with its "maximum possible funding exposure", which shall include the costs of upgrades that are reasonably allocable to the Interconnection Customer at the time the estimate is made, and the costs of any upgrades not yet constructed that were assumed in the interconnection studies for the Interconnection Customer but are, at the time of the estimate, an obligation of an entity other than the Interconnection Customer."

To comply with the FERC orders, the Scope of Work and Cost Estimate for all elements required for the interconnection are presented for the following two cases:

CASE A Facilities: All facilities required to be paid by the Project

And

CASE B Facilities: All additional facilities that may be required to be paid by the Project

The facilities included in Case B are those additional facilities required to support line protection requirements and are needed if queued ahead projects do not move forward within the timeframes required to interconnect this project.

CASE A:

Substation:

Windhub Substation

- Equip a 66 kV position
 - One dead-end structure
 - Two circuit breakers
 - Four sets of disconnect switches
 - Protection relays

Sub-Transmission:

Install one engineered steel pole, one 66 kV remote controlled switch, and two spans of conductor from the SCE dead end structure to the customer's owned structure outside of Windhub Substation property.

Telecommunication:

Install 1,200' of fiber optic cable, lightwave, channel, and associated equipment supporting protection and SCADA for the interconnection.

Corporate Environmental Services and Real Properties:

Provide mapping, survey, title work, land acquisition labor, licensing, and other activities related to Windhub Substation, gen-tie, and telecommunication requirements.

Power System Controls:

Install one Remote Terminal Unit (RTU) at the customer's facility to monitor generation data, weather data, and relay protection status alarms.

Add points to the Substation Automation System equipment at Windhub Substation to monitor the new tie line data and associated circuit breakers, and relay protection status alarms.

Metering Services Organization:

Install a SCE retail meter in tandem with the customer's ISO meter.

CASE B:

Substation:

Windhub Substation

- Install six (6) protection relays required for the Windhub A-bank SPS.

Power System Controls:

Add points on existing RTU at Windhub Substation.

The total estimated, including ITCC, of all elements of the interconnection as identified above in the Facilities Study Scope is as follows:

CASE A:	\$ 3,319,000
CASE B:	\$ 482,000
Maximum Cost Exposure:	\$ 3,801,000

See Exhibit C for cost breakdown.

VI. Conclusions

- A. The estimated cost to interconnect the Project is approximately \$3,319,000 for Case A with the potential additional cost of \$482,000 for Case B for a maximum exposure of \$3,801,000.
- B. The costs indicated in the attached tables are shown in 2012 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 Addendum and cost estimates as presented are valid for a period of 90 days.
- C. The estimated Project cost will be reconciled to actual costs upon closure of the associated work orders. The necessary billing adjustments will be made in accordance with the terms of the interconnection agreement.
- D. The time required to complete the Interconnection Facilities and Distribution Upgrades is estimated to be 24 months after receiving project authorization and funding.
A detailed Project Schedule will be provided during the Engineering and Design Phase of the Project.
- E. The results provided in this study are based on conceptual engineering and are not sufficient for permitting of facilities.

- 4. Exhibits B and C are replaced in their entirety as attached.

EXHIBIT B

**SUBTRANSMISSION SYSTEM
TECHNICAL ASSESSMENT**

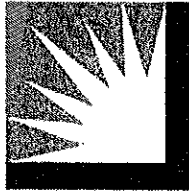
[REDACTED]

[REDACTED]

Subtransmission System Technical Assessment

Updated Queue Analysis

January 4, 2013



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Subtransmission System Queue Update Technical Assessment
January 4, 2013

On August 21, 2012, Southern California Edison ("SCE") submitted to [REDACTED] ("IC") a Technical Assessment report as an update to the original System Impact Study (SIS) Transmission Assessment to reflect changes in queue and the development of new system operating procedures. The Technical Assessment determined that the [REDACTED] (Project) triggered the need for the third A-bank transformer at Windhub, which was previously triggered by a queued ahead project. The Technical Assessment conclusions are summarized below.

Previous Technical Assessment Study Results

[REDACTED] triggers the need for the third Windhub 220/66 kV transformer bank as summarized below in Table 4.

Table 4: Thermal Overloads due to the Project Found in Technical Assessment

Overloaded Facility	Rating	Heavy Summer		Heavy Spring	
		Pre	Post	Pre	Post
Windhub 220/66 kV A Bank <i>Base Case Loading with Operating Procedure to roll Borel to Vestal System</i>	280 A (N)	92 % 257 MVA	96 % 268 MVA	99 % 277 MVA	103 % 287 MVA

Note: N=normal and E=emergency. Bold stands for loading in excess of line capability.

The cost responsibility will be directly assigned to [REDACTED]. The cost, scope, and schedule estimate for this upgrade has been previously provided in the original SIS and will not be reevaluated as a part of this technical assessment. These estimates will be reevaluated in the Facilities Study. Table 5 below indicates the projects ahead in queue that must be complete for the transformer addition to be required.

Table 5: Active Queued Ahead Northern Antelope-Bailey Area Subtransmission and Distribution Level Projects

CAISO Queue Position	Type	Size (MW)	Status
CAISO Queue #79	New Wind Project	51	In-Service
CAISO Queue #86 B	New Wind Project (Partial Repower)	34	Old units from Partial Repower In-Service
CAISO Queue #91	New Wind Project	51	In-Service
CAISO Queue #348	New Solar Project	40	GIA Pending
CAISO Queue #349	New Solar Project	100	GIA Pending
SCE WDAT #368	New Solar Project	5	GIA Pending
SCE WDAT #402	New Solar Project	10	GIA Pending
	Total	291	

Queue Update Technical Assessment Results

Since the IC received the Technical Assessment, one additional queued ahead project, included in the previous Technical Assessment Study base case, has withdrawn their interconnection application from queue. Table 1 shows the project that has withdrawn since the IC received the Technical Assessment. This project contributed to the Windhub 220/66 kV transformer banks loading.

Table 1: Withdrawn Queued Ahead Project

CAISO Queue Position	Type	Size (MW)
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CAISO Queue #86 B	New Wind Project (Partial Repower)	34 Total 16 New
	Total New	16

The withdrawal of this project results in a reduction of MW flow on the Windhub 220/66 kV transformer banks. The transformer bank loading that results from the project withdrawal and the system operating procedure previously identified for a queued ahead project can be seen in Table 2. This shows that the project no longer triggers the need for a 3rd 220/66 kV Transformer and can therefore interconnect upon completion of the Windhub 66 kV Substation work associated with SCE's East Kern Wind Resource Area (EWKRA) Project. Currently, the estimated time to complete such work is Summer of 2014.

However, it should be noted that additional work will be required to equip a 66 kV line position to terminate the Project's generation tie-line and to include the project into a transfer trip scheme which would open generation tie-line position circuit breakers at Windhub in the event one of the A-Banks were subjected to a forced outage condition. Such additional work will commence upon execution of a Small Generation Interconnection Agreement (SGIA), receipt of payment to commence work, and receipt of Notice to Proceed. The previous Facility Study issued to the IC, identified an estimated duration to complete Interconnection Facilities construction of 24 months. More current studies have shown that, with SCE's increased workload due to the rise in GIA executions, estimated work durations have increased. Currently, the estimated time to construct the Interconnection Facilities is 27 months. The actual duration will be determined during GIA negotiation.

Table 2: Transformer Bank Loading after Withdrawal of Q#86B

Overloaded Facility	Rating	Heavy Summer		Heavy Spring	
		Pre	Post	Pre	Post
Windhub 220/66 kV A Bank <i>Base Case Loading with Operating Procedure to roll Borel to Vestal System</i>	280 A (N)	91 % 253 MVA	94 % 264 MVA	96 % 269 MVA	100 % 279 MVA

Note: N = normal and E = emergency. **Bold** stands for loading in excess of line capability.

Queue Update Technical Assessment Conclusion

With the project withdrawal and the identified Operating Procedure, the need for the third A-bank transformer at Windhub would no longer be required to mitigate the overloads caused by the Project. The operating procedure will only be needed if all interconnection requests in queue, ahead of the Project, continue through the interconnection process and are put in-service. Therefore, the procedure does not need to be developed at this time. Table 3 below shows all the active queued ahead projects in the area that must execute an interconnection agreement in order for the operating procedure to be required to mitigate the overloads caused by the Project.

Table 3: Active Queued Ahead Northern Antelope-Bailey Area Subtransmission and Distribution Level Projects

CAISO Queue Position	Type	Size (MW)	Status
CAISO Queue #79	New Wind Project	51	In-Service
CAISO Queue #91	New Wind Project	51	In-Service
CAISO Queue #348	New Solar Project	40	GIA Pending
CAISO Queue #349	New Solar Project	100	GIA Pending
SCE WDAT #368	New Solar Project	5	GIA Filed at FERC
SCE WDAT #402	New Solar Project	10	GIA Filed at FERC
	Total	257	

EXHIBIT C

COST SUMMARY

WDT 435 - CASE A

Cost Estimate Summary (2012 Dollars)

Scope: Interconnection of 20 MW of generation to Windhub Substation.

No.	Element	Interconnection Facilities (Subject to ITCC)	Distribution Upgrades (Subject to ITCC)	One Time Cost (Not Subject to ITCC)	ITCC** (35%)	Total
1	Sub-Transmission					
	Subtotal	\$ 308,815	\$ -	\$ -	\$ -	\$ 308,815
	Substation					
1	Equip a 66 kV position - Interconnection	\$ 330,859	\$ -	\$ -	\$ -	\$ 330,859
2	Equip a 66 kV position - Distribution	\$ -	\$ 1,001,920	\$ -	\$ -	\$ 1,001,920
3	Install one pair of N80 relays	\$ -	\$ 110,573	\$ -	\$ -	\$ 110,573
	Subtotal	\$ -	\$ 1,112,493	\$ -	\$ -	\$ 1,112,493
	Telecommunication					
1	Install lightning, channel, and associated equipment	\$ 343,055	\$ -	\$ -	\$ -	\$ 343,055
2	Install fiber optic cables	\$ 69,716	\$ -	\$ -	\$ -	\$ 69,716
	Subtotal	\$ 412,771	\$ -	\$ -	\$ -	\$ 412,771
	Corporate Environmental Services					
1	Activities to support project	\$ 102,626	\$ -	\$ -	\$ -	\$ 102,626
	Subtotal	\$ 102,626	\$ -	\$ -	\$ -	\$ 102,626
	Licensing					
1	Activities to support project - N/A	\$ -	\$ -	\$ -	\$ -	\$ -
	Subtotal	\$ -	\$ -	\$ -	\$ -	\$ -
	Real Properties					
1	Activities to support project	\$ 42,259	\$ -	\$ -	\$ -	\$ 42,259
	Subtotal	\$ 42,259	\$ -	\$ -	\$ -	\$ 42,259
	Metering Services					
1	Requirements for the interconnection	\$ 29,598	\$ -	\$ -	\$ -	\$ 29,598
	Subtotal	\$ 29,598	\$ -	\$ -	\$ -	\$ 29,598
	Power System Controls					
1	RTU at the customer's facilities	\$ 53,327	\$ -	\$ -	\$ -	\$ 53,327
2	Point additions to RTU at Windhub Substation	\$ -	\$ -	\$ 34,113	\$ -	\$ 34,113
	Subtotal	\$ 53,327	\$ -	\$ 34,113	\$ -	\$ 87,440
	Total	\$ 1,320,250	\$ 1,112,493	\$ 34,113	\$ 87,440	\$ 2,554,296

WDT 435 - CASE B

Cost Estimate Summary (2012 Dollars)

Scope: Interconnection of 20 MW of generation to Windhub Substation.

No.	Element	Interconnection Facilities (Subject to ITCC)	Distribution Upgrades (Subject to ITCC)	One Time Cost (Not Subject to ITCC)	ITCC** (35%)	Total
	Substation					
1	Install three pairs of N80 relays	\$ -	\$ 331,719	\$ -	\$ -	\$ 331,719
	Subtotal	\$ -	\$ 331,719	\$ -	\$ -	\$ 331,719
	Power System Controls					
1	Point additions at Windhub	\$ -	\$ -	\$ 34,113	\$ -	\$ 34,113
	Subtotal	\$ -	\$ -	\$ 34,113	\$ -	\$ 34,113
	Total	\$ -	\$ 331,719	\$ 34,113	\$ -	\$ 365,832

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

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

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

Cost estimate is only an estimate based on 2012 constant dollars and actual cost is subject to change depending on project construction date, and inflation.