SPP Southwest Power Pool

Facility Study For Generator Interconnection Request GEN-2011-014

SPP Generator Interconnection

(#GEN-2011-014)

July 2014

Revision History

Date	Author	Change Description
1/12/2012	SPP	Facility Study Report Issued
3/26/2013	SPP	Account for Definitive Interconnection System Impact Restudy Results (DISIS-2011-001-3)
01/10/2014	SPP	Account for Definitive Interconnection System Impact Restudy Results (DISIS-2011-001-4)
7/8/2014	SPP	Account for Definitive Interconnection System Impact Restudy Results (DISIS-2011-001-5) and change in interconnection configuration.

Summary
Oklahoma Gas and Electric (OG&E) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2011-014 (201 MW). The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

Interconnection Customer Interconnection Facilities
The Interconnection Customer will be responsible for all of the transmission facilities connecting the customer owned substation to the Point of Interconnection (POI), a 345kV tap on the existing Hitchland – Woodward 345kV Priority Project double circuit transmission lines. In addition, the customer will be responsible for reactive power compensation equipment to maintain 95% lagging (providing vars) and 95% leading (absorbing vars) power factor at the point of interconnection.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades
To allow interconnection the Transmission Owner will need to construct a new 5 terminal substation with associated terminal equipment that is acceptable for addition of the Interconnection Customer's Interconnection Facilities. This 5 terminal substation includes terminating both circuits of Hitchland – Woodward 345kV transmission lines. At this time, GEN-2011-014 is responsible for $16,844,894 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

Additional design study work (EMTP study) will be required to determine the need for additional line reactors for the new substation. If the EMTP study determines additional line reactors are required, those costs will be in addition to the costs quoted here.

Shared Network Upgrades
The Interconnection Customer was studied within the DISIS-2011-001-5 Impact Restudy. At this time, the Interconnection Customer is allocated $0 for Shared Network Upgrades.

Upgrade Description	Allocated Cost	Total Cost
None as this time		
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX		
Total	**$0**	

If higher queued interconnection customers withdraw from the queue, suspend or terminate their GIA, restudies will have to be conducted to determine the Interconnection Customers' allocation of shared network upgrades. All studies have been conducted on the basis of higher queued interconnection requests and the upgrades associated with those higher queued interconnection requests being placed in service.

Other Network Upgrades

Certain Additional Network Upgrades are required for Interconnection. These Network Upgrades include:

1. Hitchland – Woodward 345kV double circuit transmission line, placed in-service in 2014
2. Hitchland 345/230/13kV Autotransformer circuit #2, placed in-service in 2014
3. Spearville – Clark – Thistle – Wichita 345kV double circuit 345kV transmission line, scheduled for 12/31/2014 in-service
4. Thistle – Flat Ridge 138kV circuit #1, scheduled for 12/31/2014 in-service
5. Thistle – Woodward 345kV double circuit transmission line, scheduled for 12/31/2014 in-service
6. Thistle 345/138kV Transformer circuit #1, scheduled for 12/31/2014 in-service
7. TUCO – Border – Woodward 345kV circuit #1, scheduled for 9/30/2014 in-service

Depending upon the status of higher or equally queued customers, the Interconnection Customer's in service date may be delayed until the in service date of these Network Upgrades.

Conclusion

Interconnection Service for GEN-2011-014 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Customer is responsible for $16,844,894 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. The need for additional line reactors will be determined after the completion of an EMTP study performed during the design phase. At this time, the Interconnection Customer is allocated $0 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 201 MW, as requested by GEN-2011-014 can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2011-014 are estimated at $16,844,894.

Revised
FACILITY STUDY

for

Generation Interconnection Request 2011-014

201 MW Wind Generating Facility
In Beaver County
Oklahoma

July 2, 2014

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Summary

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), Oklahoma Gas and Electric (OG&E) performed the following Facility Study to satisfy the Facility Study Agreement executed by the requesting customer for SPP Generation Interconnection request Gen-2011-014. The request for interconnection was placed with SPP in accordance SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

This revision is to study the cost of a new substation between Beaver County Substation and Woodward District EHV Substation. The original study contemplated this Gen-2011-014 terminating at Beaver County Substation. The interconnection customer requested this alternate point of interconnection.

The requirements for interconnection consist of building a new EHV substation, with five new 345kV breakers, a terminal for the wind farm line, terminating both circuits of the double circuit Woodward District EHV to Beaver Country line into and out of the substation. The total cost for OKGE to build the new substation with five new 345kV breakers, terminating both circuits of the double circuit Woodward District EHV to Beaver County line and a terminal for the wind farm line in a new EHV Substation, the interconnection facility, is estimated at $16,844,894.

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of interconnecting a wind generating facility within the service territory of OG&E Electric Services (OKGE) in Beaver County Oklahoma. The proposed 345kV point of interconnection is at a new EHV Substation in Beaver County. This substation will be owned by OKGE. The cost for adding a new 345kV terminal to a new EHV Substation, the required interconnection facility, is estimated at $1,099,958.

Network Constraints in the Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Other Network Constraints in the American Electric Power West (AEPW), Southwest Public Service (SPS), OKGE and Western Farmers Electric Cooperative (WFEC) systems may be verified with a transmission service request and associated studies.

Interconnection Facilities

The primary objective of this study is to identify attachment facilities. The requirements for interconnection consist of adding a new 345kV terminal in a new EHV Substation. This 345kV addition shall be constructed and maintained by OKGE. It is assumed that obtaining all necessary right-of-way for the line into the new OKGE 345kV substation facilities will be performed by the interconnection customer.

The total cost for OKGE to add a new 345kV terminal in an existing EHV Substation, the interconnection facility, is estimated at $1,099,958. This cost does not include building the 345kV line from the Customer substation into the new EHV Substation. The Customer is responsible for this 345kV line up to the point of interconnection. This cost does not include the Customer's 345-34.5kV substation and the cost estimate should be determined by the Customer.

This Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the Southwest Power Pool (SPP) transmission system. The transmission network facilities may not be adequate to deliver the additional generation output to the transmission system. If the customer requests firm transmission service under the SPP Open Access Transmission Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP OATT.

The costs of interconnecting the facility to the OKGE transmission system are listed in Table 1.

Short Circuit Fault Duty Evaluation

It is standard practice for OG&E to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its interrupting rating with re-closer de-rating applied, as determined by the ANSI/IEEE C37.5-1979, C37.010-1979 & C37.04-1979 breaker rating methods.

For this generator interconnection, no breakers were found to exceed their interrupting capability after the addition of the Customer's 201MW generation and related facilities. OG&E found no breakers that exceeded their interrupting capabilities on their system. Therefore, there is no short circuit upgrade costs associated with the Gen-2011-014 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2014 DOLLARS)
OKGE – **Interconnection Facilities**- Add a single 345kV line terminal to a new EHV Substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	**$1,099,958**
OKGE – **Network Upgrades** at a new EHV sub, Install 5-345kV 5000A breakers, line relaying, disconnect switches, and associated equipment.	**$15,744,936**
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	**$16,844,894**

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New Substation in Beaver County