



SPP *Southwest
Power Pool*

***Facility Study
For
Generator Interconnection
Request
GEN-2013-030***

***SPP Generator
Interconnection***

(#GEN-2013-030)

August 2014

Revision History

Date	Author	Change Description
8/4/2014	SPP	Facility Study Report Issued

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-2013-030 (300 MW). SPP has proposed the in-service date will be after the assigned Interconnection Facilities and Non-Shared Network Upgrades are constructed. Full Interconnection Service will require the Network Upgrades listed in the “Other Network Upgrades” section. 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.

Phases of Interconnection Service

It is not expected that interconnection service will require phases however, interconnection service will not be available until all interconnection facilities and network upgrades can be placed in service.

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), at the planned Oklahoma Gas and Electric (OKGE) owned 345kV Beaver County Substation. This planned OKGE 345kV Beaver County substation is tapping both Hitchland – Woodward 345kV transmission lines in Beaver County, Oklahoma. Beaver County Substation is currently assigned as a higher queued Interconnection Facilities Upgrade. The Interconnection Customer will also be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging to 0.95 leading at the POI. Additionally, reactive power analysis within the DISIS-2013-002 study shows the need for approximately 14.2 Mvar of reactors to compensate for reactive injection into the transmission system.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner will need to construct a new 345kV line terminal and two (2) breakers at the Beaver County Substation to accept the Interconnection Customer Interconnection Facilities. Since the new line terminal will be the seventh terminal for the Beaver County substation, an additional three (3) 345kV circuit breakers are required to convert the bus configuration to breaker-and-a-half. At this time GEN-2013-030 is responsible for \$5,052,157 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

Shared Network Upgrades

The Interconnection Customer was studied within the DISIS-2013-002 Impact Study. At this time, the Interconnection Customer is allocated \$0 for Shared Network Upgrades.

Share Network Upgrade Description	Allocated Cost	Total Cost
None	\$0.00	\$0.00
Total	\$0.00	

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. Spearville – Clark – Thistle 345kV double circuit 345kV transmission line, scheduled for 12/31/2014 in-service
2. Thistle – Woodward 345kV double circuit transmission line, scheduled for 12/31/2014 in-service
3. TUCO – Border 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-2013-030 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Customer is responsible for \$5,052,157 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. 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 300 MW, as requested by GEN-2013-030 can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2013-030 are estimated at \$5,052,157.



FACILITY STUDY

for

Generation Interconnection Request 2013-030

Wind Generating Facility
In Beaver County
Oklahoma

July 21, 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-2013-030 . 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. The requirements for interconnection consist of adding five breakers and a line terminal to previously Beaver County substation. The interconnection will cause the need to develop Beaver County substation from a ring bus to a breaker and a half arrangement. The total cost for OKGE to add five breakers and a terminal in the Beaver County Substation, the interconnection facility, is estimated at \$5,052,157.

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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 Beaver County Substation in Beaver County Oklahoma. This substation is owned by OKGE.

The cost for adding a new 345kV terminal to the 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.

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 Beaver County Substation. This 345kV addition shall be constructed and maintained by OKGE. The Customer did not propose a route of its 345kV line to serve its 345kV facilities. It is assumed that obtaining all necessary right-of-way for the line into the new OKGE 345kV substation facilities will not be a significant expense.

The total cost for OKGE to add a new 345kV terminal and five breakers in an existing EHV Substation, the interconnection facility, is estimated at \$5,052,157. 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 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-2013-030 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2014 DOLLARS)
OKGE – Interconnection Facilities - Add a single 345kV line terminal to an existing EHV Substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	\$1,099,958
OKGE – Network Upgrades at an existing EHV sub, Install 5-345kV 3000A breaker, line relaying, disconnect switches, and associated equipment	\$3,952,199
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	\$5,052,157

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July 21, 2014

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Beaver County Substation

