



SPP *Southwest
Power Pool*

**Facility Study
For
Generation Interconnection
Request
GEN-2011-040**

*SPP Generation
Interconnection Studies*

(#GEN-2011-040)

May 2012

Summary

OG&E Electric Services (OKGE) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2011-040 (111 MW/Wind). The originally proposed in-service date was December 31, 2012, however the customer has proposed a new in-service date of October 1, 2013. 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), a new OKGE 138 kV substation to be located on the Ratliff – Pooleville 138 kV transmission line. The 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.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner will need to construct a new 138 kV four-breaker ring-bus substation and associated equipment for acceptance of the Interconnection Customer's Interconnection Facilities. Also for adequate relaying, the Pooleville – Sunnyside 138kV line must be disconnected and rerouted through the new POI substation. To accomplish this, about $\frac{3}{4}$ of a mile of new 138kV will be needed to double circuit the 138kV from the new POI substation to Pooleville. The estimated in-service date for these Interconnection Facilities is unknown but not expected to delay the newly proposed in-service date of October 1, 2013. At this time the Customer is responsible for \$4,203,401 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

Shared Network Upgrades

The interconnection customer was studied within the DIS-2011-002 Impact Study. At this time, the Interconnection Customer is allocated \$0 for Shared Network Upgrades. 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 Other Network Upgrades are not the cost responsibility of the Customer but will be required for full Interconnection Service. These Network Upgrades include:

1. Sunnyside – Hugo 345kV, scheduled for April 1, 2012 in-service

Depending upon the status of higher or equally queued customers, the Interconnection Customer's in-service date is at risk of being delayed or their Interconnection Service is at risk of being reduced until the in-service date of these Other Network Upgrades.

Conclusion

Interconnection Service for GEN-2011-040 will be delayed until the Transmission Owner Interconnection Facilities are constructed, estimated at October 1, 2013. The Customer is responsible for \$4,203,401 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 111 MW, as requested by GEN-2011-040, can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2011-040 are estimated at \$4,203,401.



FACILITY STUDY

for

Generation Interconnection Request 2011-040

111 MW Wind Generating Facility
In Carter County
Near
Tatum, Oklahoma

May 04, 2012

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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-2011-040. 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 building a new substation with four new 138kV breakers a terminal and extending an existing 138kV transmission line approximately three fourths of a mile from the existing Pooleville substation. Extending the existing line to the new ring bus will eliminate a three terminal line and allow adequate relay protection. The total cost for OKGE to build the new substation with four new 138kV breakers and a terminal in a new substation, the interconnection facility, and extending an existing 138kV transmission line approximately three fourths of a mile is estimated at \$4,203,401.

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of interconnecting 111MW of wind generation within the service territory of OG&E Electric Services (OKGE) in Carter County Oklahoma. The proposed 138kV point of interconnection is at a new substation in Carter County. This substation will be owned by OKGE. The proposed in-service date is October 01, 2013.

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the 111MW of generation with transmission system reinforcements within the local transmission system. Given the Point of Interconnection at a new substation, there are additional requirements for interconnection including bus, breaker, switches, relaying, metering, etc.

The cost for adding a new 138kV terminal to a new substation, the required interconnection facility, is estimated at \$410,000. Other Network Constraints in the American Electric Power West (AEPW), 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 138kV terminal in a new substation. This 138kV addition shall be constructed and maintained by OKGE. The Customer did not propose a route of its 138kV line to serve its 138-34.5kV facilities. It is assumed that obtaining all necessary right-of-way for the new OKGE 138kV substation facilities will not be a significant expense.

The total cost for OKGE to add a new 138kV terminal in a new substation, the interconnection facility, is estimated at \$410,000. This cost does not include building 138kV line from the Customer substation into the new substation. The Customer is responsible for this 138kV line up to the point of interconnection. This cost does not include the Customer's 138-34.5kV 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 111 MW 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-2011-040 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2012 DOLLARS)
OKGE – Interconnection Facilities - Add a single 138kV line terminal to a new substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	\$410,000
OKGE – Network Upgrades at the new sub, 4-138kV breakers, line relaying, disconnect switches, and associated equipment	\$2,772,283
OKGE – Network Upgrades to the new sub, Rebuild approximately ¾ of a mile of 138kV transmission line to double circuit	\$621,118
OKGE - Property for new 138kV substation site	\$400,000
Total	\$4,203,401

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May 04, 2012

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New Substation

