



**Facility Study
For
Generator Interconnection
Request
GEN-2008-047**

*SPP Generator
Interconnection Studies*

(#GEN-2008-047)

November 2013

Revision History

Date	Author	Change Description
4/8/2011	SPP	Facility Study Report Issued
10/13/2010	SPP	Facility Study Report Revised
11/08/2013	SPP	Facility study revised and Account for Definitive Interconnection System Impact Restudy Results (DISIS-2010-001-6)

Summary

Oklahoma Gas and Electric (OKGE) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2008-047 (300.0 MW/Wind) located in Beaver County, Oklahoma. 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 a new Oklahoma Gas and Electric owned 345kV bus which will tap and tie in the planned Hitchland – Woodward 345kV double circuit. 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.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection Oklahoma Gas and Electric (OKGE) will need to construct a new substation with five 345kV breakers for rerouting and tie in of the planned Hitchland – Woodward 345kV double circuits along with relaying, and any associated terminal equipment for acceptance of the Interconnection Customer's Interconnection Facilities. At this time GEN-2008-047 is responsible for \$16,844,894.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. These costs also do not include any relay change out or settings that may be necessary at the SPS Hitchland interconnection.

Shared Network Upgrades

The Interconnection Customer was studied within the DISIS-2010-001 Impact Study. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades in the latest Impact Restudy. If higher or equally 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. At this time, the Interconnection Customer is allocated the following cost for Shared Network Upgrade:

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

Previous Network Upgrades

Certain Other Network Upgrades are currently not the cost responsibility of the Customer but will be required for full Interconnection Service. These Other Network Upgrades include:

1. Hitchland – Woodward 345kV double circuit, scheduled for 6/30/2014 in-service
2. Thistle – Wichita 345kV double circuit, scheduled for 12/31/2014 in-service
3. Thistle – Flat Ridge 138kV circuit #1, scheduled for 12/31/2014 in-service
4. Thistle 345/138kV transformer circuit #1, scheduled for 12/31/2014 in-service
5. TUCO Interchange – Border – Woodward circuit #1, scheduled for 5/19/2014 in-service
6. Woodward – Thistle 345kV double circuit, scheduled for 12/31/2014 in-service
7. Woodward 345/138/13.8 Transformer circuit 2, scheduled for 5/19/2014 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

The Interconnection Customer is responsible for \$16,844,894.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades.

At this time, the total allocation of costs assigned to GEN-2008-047 for Interconnection Service is estimated at \$16,844,894.00.



**Revised
FACILITY STUDY**

for

Generation Interconnection Request 2008-047

Wind Generating Facility
In Beaver County
Oklahoma

November 7, 2013

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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-2008-047. 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 does not include any relay change out or settings necessary at the SPS Hitchland interconnection. The interconnection customer should contact SPS to determine these costs. The requirements for interconnection consist of building a new substation, Beaver County substation, with five new 345kV breakers, a terminal for the wind farm line, terminating both circuits of the double circuit Woodward District EHV to Hitchland line into and out of the substation and resetting relays at Woodward District EHV 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 Hitchland line and a terminal for the wind farm line in the new Beaver County 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, Beaver County substation. 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.

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.

There are currently reactors at both ends of the double circuit Woodward District EHV to Hitchland 345kV transmission line due to switching surges. It will be necessary to install reactors on the line from Woodward District EHV to mitigate the switching surges at Beaver County Substation. The installed cost for the reactors will not be allocated to the Interconnection Customer.

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 a new EHV Substation, the interconnection facility, is estimated at \$1,099,958. This cost does not include building 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 recloser 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-2008-047 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2013 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, 5-345kV breakers, line relaying, disconnect switches, and associated equipment, reset relays at Woodward District EHV	\$15,744,936
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	\$16,844,894

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November 7, 2013

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New Beaver County Substation

