



**SPP**

*Southwest  
Power Pool*

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

***SPP Generation  
Interconnection***

***(#GEN-2008-047)***

**April 2011**

## Summary

Oklahoma Gas & Electric (OG&E) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2008-047. 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 the 345 kV transmission line from its wind turbine Collector Substation to the Point of Interconnection (POI), a new 345kV switching station located in Beaver County, OK on the Hitchland to Woodward 345 kV line. 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. Any capacitor banks installed by the Customer shall not cause voltage or other distortion on the transmission system in accordance with Article 9.7.6 of the Standard GIA, Power Quality.

## Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

Per the following Facility Study, the Interconnection Customer is responsible for **\$9,276,873** of Transmission Owner Interconnection Facilities and non-shared network upgrades.

## Shared Network Upgrades

The interconnection customer was studied within the DISIS-2010-001-1 Impact Restudy. At this time, the Interconnection Customer is allocated the following cost for shared network upgrades:

Hitchland – Border 345kV Double CKT. Build approximately 105 miles of 345kV. Includes substation work at Hitchland and Border	\$26,153,549
Hitchland -50/+100Mvar SVC at Hitchland 230kV substation	\$3,975,265
<b>Total</b>	<b>\$30,128,814</b>

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.

## Additional Required Network Upgrades

Certain Network Upgrades that are not the cost responsibility of the Customer are required for Interconnection. These Network Upgrades include:

1. Hitchland – Woodward 345kV double circuit transmission line,
2. Medicine Lodge – Woodward 345kV double circuit transmission line,
3. Medicine Lodge – Wichita double circuit 345kV transmission line, and
4. Tuco – Woodward 345kV transmission line.

These network upgrades are not schedule to be in service until December 31, 2014. 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.



## **FACILITY STUDY**

**for**

### **Generation Interconnection Request 2008-047**

Wind Generating Facility  
In Beaver County  
Oklahoma

January 12, 2011

Steve M. Hardebeck, PE  
Lead Engineer  
Transmission Planning  
**OG&E Electric Services**

## **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 with three new 345kV breakers a terminal and resetting relays at Woodward District EHV substation. The total cost for OKGE to build the new substation with three new 345kV breakers and a terminal in a new EHV substation, the interconnection facility, is estimated at \$9,276,873.

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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. 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 345kV terminal in a new EHV 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 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 (2005 DOLLARS)
OKGE – <b>Interconnection Facilities</b> - Add a single 345kV line terminal to a new EHV Substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	<b>\$1,099,958</b>
OKGE – <b>Network Upgrades</b> at a new EHV sub, 3-345kV breakers, line relaying, disconnect switches, and associated equipment, reset relays at Woodward District EHV	<b>\$8,176,915</b>
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
<b>Total</b>	<b>\$9,276,873</b>

Prepared by Steve M. Hardebeck, PE

January 12, 2011

Lead Engineer, Transmission Planning  
OG&E Electric Services

Reviewed by:

*Philip L. Crissup, PE*  
Philip L. Crissup  
Director, Regional Transmission Affairs

*January 28, 2011*



# New Woodward EHV to Hitchland Substation

