



**SPP**

*Southwest  
Power Pool*

***Facility Study  
For  
Generation Interconnection  
Request  
GEN-2008-013***

***SPP Tariff Studies***

***(#GEN-2008-013)***

**February 2010**

## **Summary**

Oklahoma Gas and Electric performed the following Study at the request of the Southwest Power Pool (SPP) for Generation Interconnection request Gen-2008-013. 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.

Pursuant to the tariff, Oklahoma Gas and Electric was asked to perform a detailed Facility Study of the generation interconnection request to satisfy the Facility Study Agreement executed by the requesting customer and SPP.

## **Interconnection Customer Interconnection Facilities**

The Interconnection Customer will be responsible for the 345kV transmission line from the point of interconnection to its 345/34.5kV substation that will contain its 345/34.5kV transformer(s) and wind turbine collector feeders. In addition, the Customer will be required to maintain a +/- 98% leading/lagging power factor at the point of interconnection (OG&E Wichita - Woodring 345kV transmission line).

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

Per the following Facility Study, the Interconnection Customer is responsible for \$1,099,958 of Transmission Owner Interconnection Facilities and \$8,176,915 of non shared Network Upgrades.

## **Shared Network Upgrades**

The GEN-2008-013 Interconnection Customer is included in the 1<sup>st</sup> Cluster Study approved in FERC Docket #ER09-262. The Interconnection Customer's shared upgrade costs are \$0. This cost is subject to change depending upon the Facility Study for the shared network upgrades. This cost is also subject to change for restudies conducted by the Transmission Provider in response to the higher queued customers or other customers in the 1<sup>st</sup> Cluster that withdraw their interconnection request or suspend, terminate, or request unexecuted filings of their LGIAs.



## **FACILITY STUDY**

**for**

### **Generation Interconnection Request 2008-013**

300 MW Wind Generating Facility  
In Garfield County  
Near  
Enid, Oklahoma

December 05, 2009

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-2008-013. 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 Western Resources Wichita interconnection. The interconnection customer should contact Western Resources to determine these costs. The requirements for interconnection consist of building a new substation with three new 345kV breakers a terminal and replacing relays at Woodring substation. The total cost for OKGE to build the new substation with three new 345kV breakers and a terminal in the new Woodring to Wichita 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 300MW of wind generation within the service territory of OG&E Electric Services (OKGE) in Garfield County Oklahoma. The proposed 345kV point of interconnection is at the new Woodring to Wichita EHV Substation in Garfield County. This substation is owned by OKGE. The proposed in-service date is June 01, 2011.

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the 300MW 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 345kV terminal to the new Woodring to Wichita 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 the new Woodring to Wichita 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 138-34.5kV facilities. It is assumed that obtaining all necessary right-of-way for the new OKGE 345kV substation facilities will not be a significant expense.

The total cost for OKGE to add a new 345kV terminal in the new Woodring to Wichita 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 Woodring to Wichita 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 300 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-2008-013 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 existing Garfield District 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 Garfield District EHV sub, 3-345kV breakers, line relaying, disconnect switches, and associated equipment, replace relays at Woodring	<b>\$8,176,915</b>
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
<b>Total</b>	<b>\$9,276,873</b>

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December 05, 2009

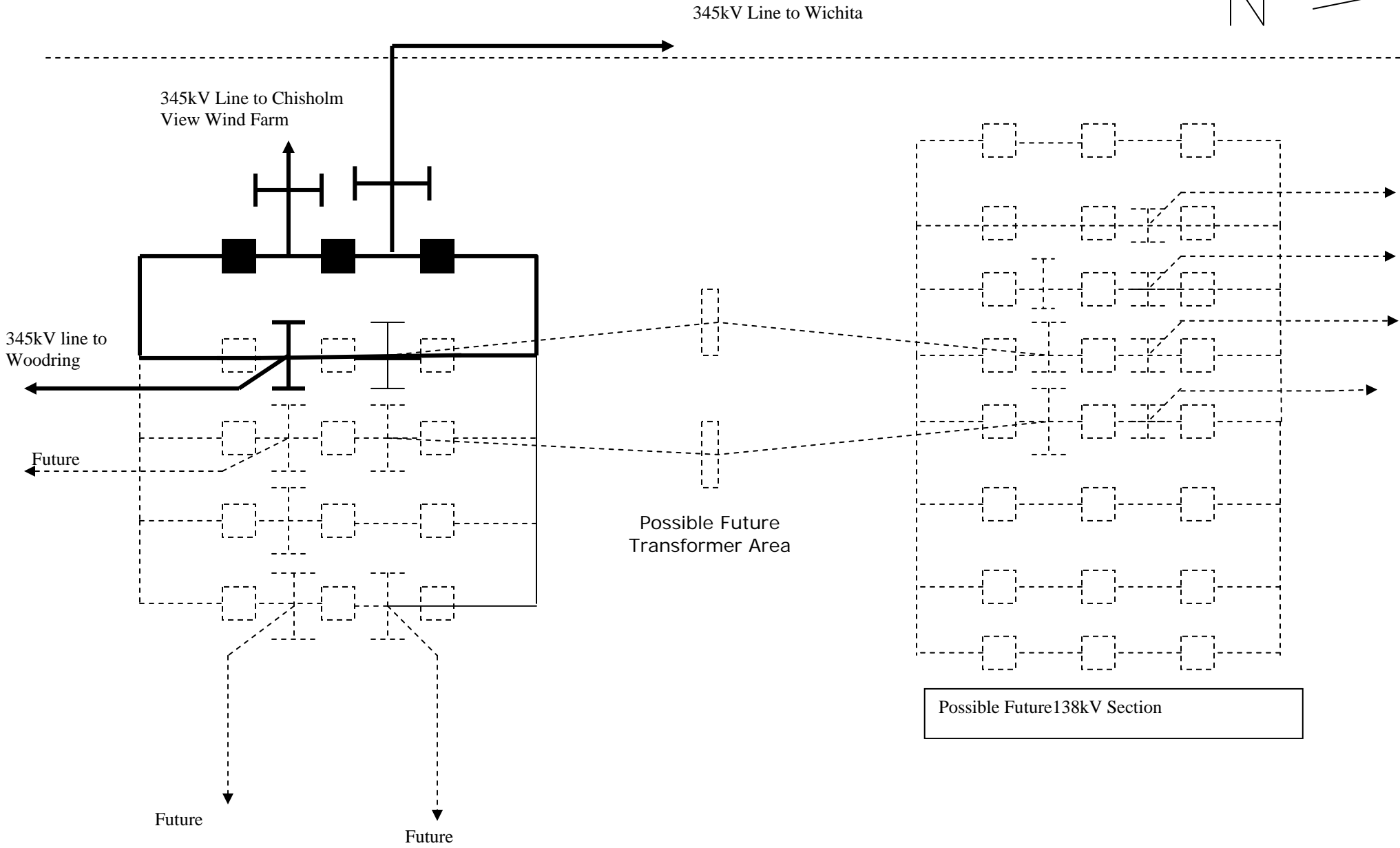
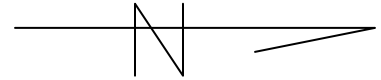
Reviewed by:

*Philip L Crissup 7 December 2009*

Philip L. Crissup  
Director, Regional Transmission Affairs



# New Woodring to Wichita EHV Substation



# One-line Diagram

