



**SPP** *Southwest  
Power Pool*

**Facility Study  
For  
Generation Interconnection  
Request  
GEN-2011-051**

***SPP Tariff Studies***

***(#GEN-2011-051)***

**June 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-2011-051 (104 MW/Wind). The originally proposed in-service date was December 31, 2013, however due to upgrades required for interconnection SPP has proposed a new in-service date of December 31, 2014. 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 345 kV substation to be located on the Woodward – Tatonga 345 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 345 kV three-breaker ring-bus substation with three-345 kV line terminals and associated equipment for acceptance of the Interconnection Customer's Interconnection Facilities. The estimated in-service date for these Interconnection Facilities is unknown but not expected to delay the newly proposed in-service date of December 31, 2014. At this time the 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 DIS-2011-002 Impact Study. At this time, the Interconnection Customer is allocated \$3,668,453.98 for Shared Network Upgrades, as listed below:

1. Cimarron – Draper 345kV, Replace Line Traps (NRIS only)
2. Glass Mountain – Mooreland 138kV, Rebuild 24 miles of transmission (NRIS Only)

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

1. Beaver – Woodward 345kV double circuit, scheduled for 6/30/2014 in-service

2. Beaver County – Gray County (Buckner) 345kV, assigned to DIS-2011-001 Customers
3. Benton - Wichita 345kV terminal equipment, assigned to DIS-2011-001 Customers
4. Woodward – Border - TUCO 345kV, scheduled for 5/19/2014 in-service
5. El Reno – Roman Nose 138kV rebuild, assigned to DIS-2011-001 Customers
6. FPL Switch – Woodward 138kV rebuild, assigned to DIS-2011-001 Customers
7. Hitchland – GEN-2011-021 Tap – Beaver 345kV double circuit, scheduled for 6/30/2014 in-service
8. Hitchland 345/230 transformer circuit 2, scheduled for 6/30/2014 in-service
9. Matthewson – Cimarron 345kV circuit 2, assigned to DIS-2011-001 Customers
10. Mooreland – Woodward 138kV rebuild, assigned to DIS-2011-001 Customers
11. Spearville – Mullergren 345kV double circuit, assigned to DIS-2011-001 Customers
12. Tatonga – Matthewson 345kV circuit 2, assigned to DIS-2011-001 Customers
13. Thistle - Wichita 345kV double circuit, scheduled for 12/31/2014 in-service
14. Thistle - Woodward 345kV double circuit, scheduled for 12/31/2014 in-service
15. Thistle 345/138kV transformer, scheduled for 12/31/2014 in-service
16. Woodward 345/138kV 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**

Interconnection Service for GEN-2011-051 will be delayed until the Transmission Owner Interconnection Facilities and Network Upgrades are constructed, estimated at December 31, 2014. The Customer is responsible for \$9,276,873 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is also allocated \$3,668,454 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 104 MW, as requested by GEN-2011-051, can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2011-051 are estimated at \$12,945,327.



## **FACILITY STUDY**

**for**

### **Generation Interconnection Request 2011-051**

104 MW Wind Generating Facility  
In Woodward County  
Near  
Seiling, Oklahoma

May 16, 2012

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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-2011-051. 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 three new 345kV breakers and a terminal. The total cost for OKGE to build the new substation with three new 345kV breakers and a terminal in a new substation in the Tatonga to Woodward District EHV 345kV transmission line, 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 104MW of wind generation within the service territory of OG&E Electric Services (OKGE) in Woodward County Oklahoma. The proposed 345kV point of interconnection is at a new substation in the Tatonga to Woodward District EHV 345kV transmission line in Woodward County. This substation will be owned by OKGE. The proposed in-service date is December 31, 2014.

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the 104MW of generation 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 a new 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 substation in the Tatonga to Woodward District EHV 345kV transmission line. This 345kV addition shall be constructed and maintained by OKGE. The Customer did not propose a route of its 345kV line to serve its 345-34.5kV 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 a new 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 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 104 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-2011-051 interconnection.

**Table 1: Required Interconnection Network Upgrade Facilities**

Facility	ESTIMATED COST (2012 DOLLARS)
OKGE – <b>Interconnection Facilities</b> - Add a single 345kV line terminal to a new substation in the Tatonga to Woodward District EHV 345kV transmission line. 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 substation in the Tatonga to Woodward District EHV 345kV transmission line, install 3-345kV breakers, line relaying, disconnect switches, and associated equipment	<b>\$8,176,915</b>
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
<b>Total</b>	<b>\$9,276,873</b>

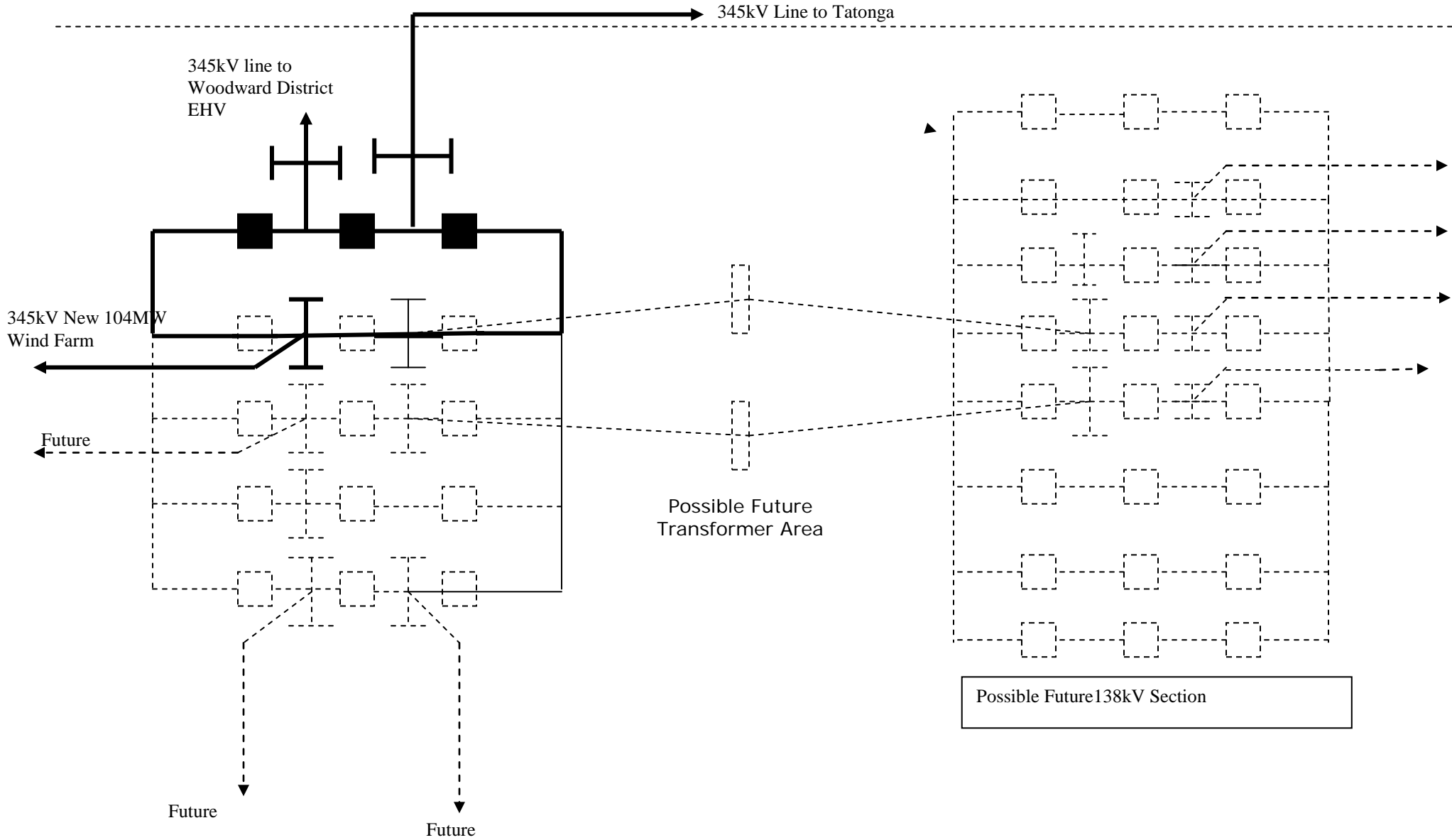
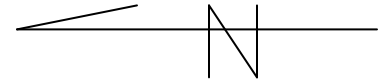
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May 16, 2012

Reviewed by:

Travis D. Hyde  
*Travis D. Hyde 5/24/12*  
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# Proposed New Substation in the Tatonga to Woodward District EHV 345kV transmission line



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