



**SPP** *Southwest  
Power Pool*

***Facility Study  
For  
Generation Interconnection  
Request  
GEN-2010-001***

***SPP Generation  
Interconnection Studies***

***(#GEN-2010-001)***

**March 2013**

---

## Revision History

---

| Date      | Author | Change Description  |
|-----------|--------|---|
| 7/29/2011 | SPP    | Facility Study Report Issued  |
| 3/26/2013 | SPP    | Account for Definitive Interconnection System Impact Restudy Results (DISIS-2010-002-4) |

### Summary

Oklahoma Gas & Electric (OG&E) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2010-001. 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), the proposed Beaver County 345kV substation to be located in Beaver County. 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.

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

Per the following Facility Study, the Interconnection Customer is responsible for \$3,566,677.00 of Transmission Owner Interconnection Facilities and non-shared network upgrades.

### Shared Network Upgrades

The interconnection customer was studied within the DISIS-2010-002-4 Impact Restudy. At this time, the Interconnection Customer is allocated \$0.00 for shared network upgrades.

| Upgrade Description | Allocated Cost | Total Cost |
|---------------------|----------------|------------|
| None                | \$0.00         | \$0.00     |
|                     |                |            |
| <b>Total</b>        | <b>\$0.00</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, scheduled for 6/30/2014 in-service
2. Thistle 345/138kV transformer circuit #1, schedule for 12/31/2014
3. Woodward transformer 345/138/13.8kV circuit #1, scheduled for 5/19/2014 in-service
4. Woodward – Thistle 345kV double circuit transmission line, scheduled for 12/31/2014 in-service
5. Woodward – Wichita 345kV double circuit transmission line, scheduled for 12/31/2014
6. Woodward – Border - TUCO Interchange 345kV circuit #1, scheduled for 5/19/2014 in-service

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.

### **Conclusion**

Interconnection Service for GEN-2010-001 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Customer is responsible for \$3,566,677.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 300.0 MW, as requested by GEN-2010-001 can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2010-001 are estimated at \$3,566,677.00.



## **FACILITY STUDY**

**for**

### **Generation Interconnection Request 2010-001**

Beaver West Wind  
Wind Generating Facility  
In Beaver County  
Oklahoma

May 17, 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-2010-001. 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 adding one breaker and a line terminal to previously proposed Beaver County substation. Beaver County substation was proposed in conjunction with Facility Study Gen-2008-047. The total cost for OKGE to add one breaker and a terminal in the Beaver County substation, the interconnection facility, is estimated at \$3,566,677.

## Table of Contents

|                                     |   |
|-------------------------------------|---|
| Table of Contents                   | 3 |
| Introduction                        | 4 |
| Interconnection Facilities          | 5 |
| Interconnection Costs               | 6 |
| One-Line diagram of Interconnection | 7 |

## **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 Beaver County Substation in Beaver County Oklahoma. This substation is owned by OKGE.

The cost for adding a new 345kV terminal to the Substation, the required interconnection facility, is estimated at \$1,099,958.

Network Constraints in the Southwest Public Service (SPS), 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 Beaver County 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 an existing EHV Substation, the interconnection facility, is estimated at \$1,099,958. This cost does not include building the 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 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 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-2010-001 interconnection.

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

| Facility  | ESTIMATED COST<br>(2011 DOLLARS) |
|---|----------------------------------|
| OKGE – <b>Interconnection Facilities</b> - Add a single 345kV line terminal to an existing 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 an existing EHV sub, Install 1-345kV 5000A breaker, line relaying, disconnect switches, and associated equipment  | <b>\$2,466,719</b>               |
| OKGE - Right-of-Way for 345kV terminal addition   | No Additional ROW                |
| <b>Total</b>  | <b>\$3,566,677</b>               |

Prepared by Steve M. Hardebeck, PE

May 17, 2011

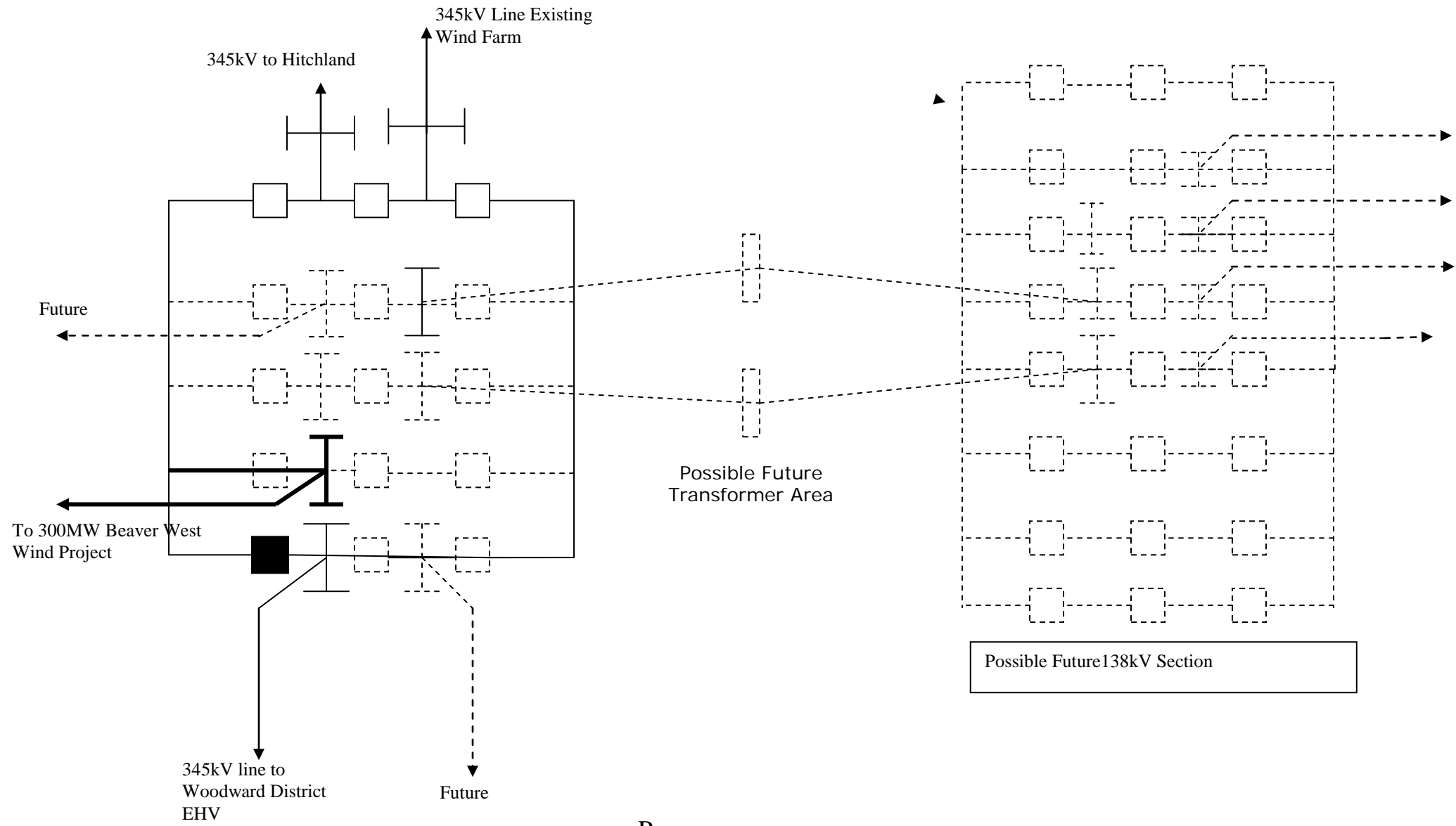
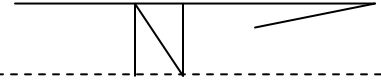
Lead Engineer, Transmission Planning  
OG&E Electric Services

Reviewed by:

*Philip L Crissup*      6/1/2011

Philip L. Crissup  
Director, Regional Transmission Affairs

# Beaver County Substation



PL