



***Facility Study
For
Generation Interconnection
Request
GEN-2008-044 and
GEN-2010-011***

SPP Tariff Studies

***(#GEN-2008-044 and
Gen-2010-011)***

March 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-2008-044 (197.8 MW) and its associated request GEN-2010-011 (29.7 MW). The proposed in-service date is November 1, 2011. 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 the Wind turbine Collector Substation to the Point of Interconnection (POI), the existing Tatonga 345 kV substation located in Dewey County, Oklahoma. 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 **\$3,403,020** of Transmission Owner Interconnection Facilities and non-shared network upgrades. This cost includes the cost to install and remove the temporary Special Protection Scheme that was approved for this interconnection request and is discussed in the Limited Operation Impact Study for this request.

Shared Network Upgrades

The interconnection customer was studied within the DISIS-2010-001 Impact Study. At this time, the Interconnection Customer is allocated **\$0** for shared network upgrades. 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 Network Upgrades that are not the cost responsibility of the Customer are required for Interconnection. These Network Upgrades include:

1. the Woodward – Medicine Lodge double circuit 345kV transmission line
2. The Medicine Lodge – Wichita double circuit 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 is at risk of being delayed until the in service date of these Network Upgrades.

Special Protection Scheme Approval

The Interconnection Customer has requested and been approved by SPP's Working Groups and Committees to have a Special Protection Scheme installed at the Tatonga 345kV substation that will trip the Customer generation in the case of Tatonga – Northwest 345kV line outage. This special protection scheme will allow the Interconnection Customer to temporarily operate their generation facility until such time that the Other Network Upgrades listed above are placed in service or, in accordance with the Tariff, until such time that higher queued customers may come on line.



FACILITY STUDY

for

Generation Interconnection Request Gen-2008-044 and Associated Gen-2010-011

197.8 MW Wind Generating Facility and Additional 29.7 MW
In Dewey County
Near
Taloga, Oklahoma

December 14, 2010

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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-2008-044 and 2010-011. Gen-2008-044 is a 197.8MW wind generating facility and Gen-2010-011 is a 29.7 MW addition to the same facility. This would be a total of 227.8MW interconnected at the same interconnection point. 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 new 345kV breaker a terminal and a Special Protection Scheme (SPS) in the existing Tatonga Substation. The total cost for OKGE to add a new 345kV breaker and a terminal in the Tatonga substation, the interconnection facility, is estimated at \$3,073,333. The total cost to install the SPS at Tatonga substation and Northwest substation and later remove and place in normal operation is \$329,701.

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of interconnecting 197.8MW and an additional 29.7MW of wind generation within the service territory of OG&E Electric Services (OKGE) in Dewey County Oklahoma. The proposed 345kV point of interconnection is at the existing Tatonga Substation in Dewey County. This substation is owned by OKGE. The proposed in-service date is November 01, 2011.

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the 197.8MW plus the 29.7MW of generation with transmission system reinforcements within the local transmission system. Given the Point of Interconnection at an existing substation, there are additional requirements for interconnection including bus, breaker, switches, relaying, metering, and a Special Protection Scheme to allow operation of the facility prior to completion of Previous Network Upgrades.

The cost for adding a new 345kV terminal to the existing Tatonga 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 existing Tatonga 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 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 the Tatonga substation, the interconnection facility, is estimated at \$1,099,958. This cost does not include building 345kV line from the Customer substation into the existing Tatonga 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 197.8MW plus the additional 29.7MW generation 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-2008-044 and Gen-2010-011 interconnections.

Table 1: Required Interconnection Network Upgrade Facilities

| Facility | ESTIMATED COST (2010 DOLLARS) |
|--|----------------------------------|
| OKGE – Interconnection Facilities - Add a single 345kV line terminal to existing Tatonga Substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs | \$1,099,958 |
| OKGE – Network Upgrades at Tatonga sub, 1-345kV breaker, line relaying, disconnect switches, and associated equipment | \$1,973,375 |
| OKGE – Special Protection Scheme Install SPS at Tatonga sub and Northwest Sub, motorize switches, 2000A wave trap, line tuner, Universal Power Line Carrier and associated equipment | \$232,247 |
| OKGE – Special Protection Scheme Remove SPS at Tatonga sub and Northwest Sub for normal operation, 2000A wave trap, line tuner, Universal Power Line Carrier and associated equipment. After Previous Network Upgrades are complete | \$97,454 |
| OKGE - Right-of-Way for 345kV terminal addition | No Additional ROW |
| Total | \$3,403,020 |

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Tatonga Substation Configuration With GEN-2008-044 & GEN-2010-011 Integration

