SPP Southwest Power Pool

Facility Study For Generation Interconnection Request GEN-2011-024

SPP Generation Interconnection

(#GEN-2011-024)

April 2013

Revision History

Date	Author	Change Description
01/10/2012	SPP	Facility Study Report Issued
06/12/2013	SPP	Account for Definitive Interconnection System Impact Restudy Results (DISIS-2011-001-3)

Summary
Oklahoma Gas and Electric (OG&E) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2011-024 (299.0 MW). 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 farm Substation to the Point of Interconnection (POI), the Tatonga 345kV substation. 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 $3,654,353 of Transmission Owner Interconnection Facilities and non-shared network upgrades.

Shared Network Upgrades
The Interconnection Customer was studied within the DISIS-2011-001-3 Impact Restudy. At this time, the Interconnection Customer is allocated $32,978,775.74 for shared network upgrades.

Upgrade Description	Allocated Cost	Total Cost
Matthewson – Cimarron 345kV circuit #2. Build second 345kV transmission line between Matthewson and Cimarron at 3000 amps	$6,616,012.24	$42,903,753.00
Tatonga – Matthewson 345kV circuit #2. Build Matthewson Substation. Build second 345kV transmission line between Tatonga and Matthewson at 3000 amps	$24,476,234.06	$104,260,473.00
Mooreland – FPL Switch 138kV circuit #1. Rebuild approximately 0.2 miles of 138kV transmission line. (NRIS only required upgrade).	$61,965.94	$820,000.00
FPL Switch – Woodward 138kV circuit #1. Rebuild approximately 12 miles of 138kV transmission line. (NRIS only required upgrade).	$586,409.37	$7,760,000.00
Glass Mountain – Mooreland 138kV circuit #1. Rebuild approximately 24 miles of 138kV transmission line. (NRIS only required upgrade).	$1,238,154.13	$15,072,467.00
Total	**$32,978,775.74**	

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 Additional Network Upgrades are required for Interconnection. These Network Upgrades include:

1. Thistle – Wichita 345kV double circuit 345kV transmission line, scheduled for 12/31/2014 in-service
2. Thistle – Flat Ridge 138kV circuit #1, scheduled for 12/31/2014 in-service
3. Thistle – Woodward 345kV double circuit transmission line, scheduled for 12/31/2014 in-service
4. Thistle 345/138kV Transformer circuit #1, scheduled for 12/31/2014 in-service
5. Tuco – Woodward 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-2011-024 will be delayed until the Transmission Owner Interconnection Facilities and Network Upgrades are constructed. The Customer is responsible for $3,654,353.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated $32,978,775.74 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 299.0 MW, as requested by GEN-2011-024 can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2011-024 are estimated at $36,633,128.74.

FACILITY STUDY

for

Generation Interconnection Request 2011-024

300 MW Wind Generating Facility
In Dewey County
Near
Taloga, Oklahoma

December 08, 2011

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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-2011-024. 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 and a terminal 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 $3,654,353.

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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 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 September 15, 2014.

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 an existing substation, there are additional requirements for interconnection including bus, breaker, switches, relaying, metering, etc.

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 into the OKGE 345kV substation 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 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 300MW 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-2011-024 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2011 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	**$2,554,395**
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	**$3,654,353**

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Tatonga Substation