Southwest Power Pool

Facility Study For Generation Interconnection Request GEN-2011-019

SPP Generation Interconnection

(#GEN-2011-019)

January 2012

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-2011-019 (299 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 Woodward EHV 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 Impact Study. At this time, the Interconnection Customer is allocated **$62,901,400.05** for shared network upgrades.

Upgrade Description	Allocated Cost	Total Cost
Benton – Wichita 345kV Replace terminal equipment at Benton and Wichita.	$119,324.25	$1,183,000.00
Cleo Corner – Glass Mountain 138kV. Rebuild approximately 26 miles of 138kV line from Cleo Corner – Glass Mountain	$12,000,000.00	$24,000,000.00
Dover Switch – Okeene 138kV. Rebuild approximately 27 miles of 138kV line from Dover Switch - Okeene	$5,500,000.00	$11,000,000.00
El Reno – Roman Nose 138kV. Rebuild approximately 27 miles of 138kV line from El Reno – Roman Nose.	$12,500,000.00	$25,000,000.00
Elk City Terminal Equipment. Replace Terminal equipment at Elk City.	$189,824.50	$379,649.00
Evans Energy Center – Maize 138kV. Rebuild approximately 2.6 miles of 138kV line from Evans Energy Center to Maize.	$2,093,059.50	$4,186,119.00
Glass Mountain – Mooreland 138kV Rebuild approximately 24 miles of 138kV line from Glass Mountain to Mooreland	$8,529,950.00	$17,059,900.00
Matthewson – Cimarron 345kV CKT 2. Build second 345kV circuit from Matthewson to Cimarron	$2,295,525.12	$29,125,118.00

Roman Nose – Southard 138kV. Rebuild approximately 17 miles of 138kV line from Roman Nose to Southard.	$8,000,000.00	$16,000,000.00
Tatonga – Matthewson 345kV CKT 2. Build second 345kV circuit from Tatonga to Matthewson.	$11,673,716.68	$105,965,000.00
Total	**$62,901,400.05**	

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 the Woodward-Medicine Lodge double circuit 345kV transmission line and 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 may be delayed until the in service date of these Network Upgrades.

FACILITY STUDY

for

Generation Interconnection Request 2011-019

299 MW Wind Generating Facility
In Woodward County
Near
Woodward, Oklahoma

December 01, 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-2011-019. 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 a new 345kV breaker and a terminal in the existing OG&E Woodward District EHV Substation. The total cost for OKGE to add a new 345kV breaker and a terminal for the wind farm line into the existing Woodward District EHV Substation, 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 299MW 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 the existing OG&E Woodward District Substation in Woodward County. 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 299MW 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, breakers, switches, relaying, metering, etc.

The cost for adding a new 345kV terminal to the existing Woodward District 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 Woodward District 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 Woodward District 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 Woodward District 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 299 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-2011-019 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2011 DOLLARS)
OKGE – **Interconnection Facilities**- Add a single 345kV line terminal to the Woodward District EHV Substation. Dead end structure, line switches, line relaying, revenue metering including CTs and PTs	**$1,099,958**
OKGE – **Network Upgrades** At Woodward District EHV sub add 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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New Woodward District EHV Substation Configuration