Southwest Power Pool

Facility Study For Generation Interconnection Request GEN-2011-014

SPP Generation Interconnection Studies

(#GEN-2011-014)

March 2013

Revision History

Date	Author	Change Description
1/12/2012	SPP	Facility Study Report Issued
3/26/2013	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-2011-014 (201 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 Beaver County 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 $3,954,353.00 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 $33,109,689.59 for shared network upgrades.

Upgrade Description	Allocated Cost	Total Cost
Beaver County - Buckner 345kV circuit #1. Build approximately 90 miles of 345kV from Beaver County - Buckner (construction by OKGE).	$11,031,401.66	$105,609,050.00
Beaver County - Buckner 345kV circuit #1. Build approximately 90 miles of 345kV from Beaver County - Buckner (construction by Sunflower).	$6,747,798.11	$64,600,000.00
Matthewson – Cimarron 345kV circuit #2. Build second 345kV transmission line between Matthewson and Cimmarron (Construction by OKGE).	$1,869,203.09	$42,903,753.00
Tatonga – Matthewson 345kV circuit #2. Build second 345kV transmission line between Tatonga and Matthewson (Construction by OKGE).	$6,230,121.24	$104,260,473.00
Mooreland – FPL Switch 138kV circuit #1. Rebuild approximately 0.2 miles of 138kV transmission line. (NRIS only required upgrade).	$188,427.93	$820,000.00
FPL Switch – Woodward 138kV circuit #1. Rebuild approximately 12 miles of 138kV transmission line. (NRIS only required upgrade).	$1,783,171.67	$7,760,000.00
Glass Mountain – Mooreland 138kV circuit #1. Rebuild approximately 24 miles of 138kV transmission line. (NRIS only required upgrade).	$3,383,486.70	$15,072,467.00
Woodward – Woodward 138kV CKT 1. Rebuild approximately 4.4 miles of 138kV transmission line. (NRIS only required upgrade).	$804,033.94	$3,000,000.00

Woodward 138/69/13.2kV transformer CKT 2. Install 2nd 138/69/13.2kV transformer at Woodward. (NRIS only required upgrade).	$1,072,045.25	$4,000,000.00
Total	**$33,109,689.59**	

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. Woodward (OKGE) – Woodward (WFEC) circuit #1 rebuild, per NTC 20003
2. Hitchland – Woodward 345kV double circuit transmission line, scheduled for 6/30/2014 in-service
3. Spearville – Clark – Thistle 345kV double circuit 345kV transmission line, scheduled for 12/31/2014 in-service
4. Thistle – Flat Ridge 138kV circuit #1, scheduled for 12/31/2014 in-service
5. Thistle – Wichita 345kV double circuit 345kV transmission line, scheduled for 12/31/2014 in-service
6. Thistle – Woodward 345kV double circuit transmission line, scheduled for 12/31/2014 in-service
7. Thistle 345/138kV Transformer circuit #1, scheduled for 12/31/2014 in-service
8. Tuco – Woodward 345kV circuit #1, scheduled for 5/19/2014 in-service
9. Woodward 345/138/13.8kV 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 may be delayed until the in service date of these Network Upgrades.

Conclusion

Interconnection Service for GEN-2011-014 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Customer is responsible for $3,954,353.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated $33,109,689.59 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 201 MW, as requested by GEN-2011-014 can be allowed. At this time the total allocation of costs of Interconnection Service for GEN-2011-014 are estimated at $37,064,042.59.

FACILITY STUDY

for

Generation Interconnection Request 2011-014

201 MW Wind Generating Facility
In Beaver County
Oklahoma

November 30, 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-2011-014. 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 two breakers and a line terminal to previously proposed Beaver County substation. Beaver County substation was proposed in conjunction with Facility Study Gen-2008-047 and expanded under DISIS 2010-002. The total cost for OKGE to add two breakers and a terminal in the Beaver County substation, the interconnection facility, is estimated at $3,954,353.

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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 proposed in-service date is April, 2014.

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 201MW 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-2011-014 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2011 DOLLARS)
OKGE – **Interconnection Facilities**- Add a single 345kV line terminal to an existing EHV Substation. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	**$1,099,958**
OKGE – **Network Upgrades** at an existing EHV sub, Install 2-345kV 5000A breakers, line relaying, disconnect switches, and associated equipment	**$2,854,395**
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	**$3,954,353**

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Beaver County Substation