Southwest Power Pool

Facility Study
For
Generator Interconnection Request
GEN-2013-035

(IFS-2014-001-01)

SPP Generator Interconnection Studies

(#GEN-2013-035)

January 2015

Revision History

Date	Author	Change Description
1/09/2015	SPP	Facility Study Report Issued

Summary

Oklahoma Gas and Electric (OKGE) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2013-035 (105.6 MW/Wind) located in Woodward and Major Counties, Oklahoma. The Interconnection Request has been assigned the Interconnection Queue position of IFS-2014-001-01. SPP has proposed the in-service date will be after the assigned Interconnection Facilities and Non-Shared Network Upgrades are constructed. Full Interconnection Service will require the Network Upgrades listed in the "Other Network Upgrades" section. 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.

Phases of Interconnection Service

It is not expected that interconnection service will require phases however, interconnection service will not be available until all interconnection facilities and network upgrades can be placed in service.

Interconnection Customer Interconnection Facilities

The Interconnection Customer will be responsible for all of the transmission facilities connecting the customer owned substation to the Point of Interconnection (POI), at the SPP Generation Interconnection higher queued request assigned GEN-2011-051 Tap 345kV Substation. GEN-2011-051Tap Substation will be an Oklahoma Gas and Electric (OKGE) owned 345kV Substation tapping Woodward – Tatonga 345kV Double Circuits. The Interconnection Customer will also be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging to 0.95 leading at the POI. Additionally, reactive power analysis within the DISIS-2014-001 study shows the need for approximately 10.0Mvar of reactors to compensate for reactive injection into the transmission system.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner will need construct a terminal and breaker along with associated terminal equipment that is acceptable for the addition of the Interconnection Customer's Interconnection Facilities. At this time GEN-2013-035 is responsible for $2,250,100 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. If GEN-2011-051 Interconnection Request is withdrawn or has its Generator Interconnection Agreement terminated, then the estimated $9,276,873 cost for the new GEN-2011-051 Tap Substation and associated terminal equipment could be assigned to GEN-2013-035.

Possibility of Out of Sequence Construction – As of the posting of this study, the GEN-2011-051 GIA is in suspension and has no set in-service date. If the Interconnection Customer requests an in service date prior to the in service date of the GEN-2011-051 GIA, Interconnection Customer will be required to advance the costs of the three breaker ring bus (estimated at $9,276,873). Once GEN-2011-051 provides authorization to proceed and begins making payments to go in service, the payments from GEN-2011-051 will be forwarded to Interconnection Customer. The Interconnection Customer assigned costs for Transmission Owner Interconnection Facilities and Network Upgrades (estimated at $2,250,100) will be subtracted from the payments.

Shared Network Upgrades
The Interconnection Customer was studied within the DISIS-2014-001 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. At this time, the Interconnection Customer is allocated the following cost for Shared Network Upgrade:

Share Network Upgrade Description	Allocated Cost	Total Cost
None	$0	$0
Total	$0	

Other Network Upgrades
Certain Other Network Upgrades are currently not the cost responsibility of the Customer but will be required for full Interconnection Service. Currently, no Other Network Upgrades are required.

Depending upon the status of higher or equally queued customers, the Interconnection Customer's in-service date is at risk of being delayed or their Interconnection Service is at risk of being reduced until the in-service date of these Other Network Upgrades.

Conclusion
Interconnection Service for GEN-2013-035 will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are constructed. The Interconnection Customer is responsible for $2,250,100 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated $0 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 105.6 MW, as requested by GEN-2013-035, can be allowed. At this time the total allocation of costs assigned to GEN-2013-035 for Interconnection Service are estimated at $2,250,100.

FACILITY STUDY

for

Generation Interconnection Request 2013-035

Wind Generating Facility
In Woodward and Major Counties
Oklahoma

December 1, 2014

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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-2013-035. 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 a new EHV substation established under GEN-2011-051. The total cost for OKGE to add one breaker and a terminal in the new GEN-2011-051 substation, the interconnection facility, is estimated at $2,250,100.

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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 Woodward and Major Counties, Oklahoma. The proposed 345kV point of interconnection is at a new EHV substation established under GEN-2011-051 in Dewey 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 a substation established in GEN-2011-051. 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-2013-035 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2014 DOLLARS)
OKGE – **Interconnection Facilities**- Add a single 345kV line terminal to a new EHV Substation to be built under GEN-2011-051. Dead end structure, line switch, line relaying, revenue metering including CTs and PTs	**$1,099,958**
OKGE – **Network Upgrades** at a new EHV Substation to be built under GEN-2011-051, Install 1-345kV 5000A breaker, line relaying, disconnect switches, and associated equipment	**$1,150,142**
OKGE - Right-of-Way for 345kV terminal addition	No Additional ROW
Total	**$2,250,100**

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New GEN-2011-051 Substation