



INTERCONNECTION FACILITIES STUDY REPORT

GEN-2015-062
(IFS-2015-002-15)

Published March 2018

By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION	COMMENTS
3/15/2017	SPP	Initial draft report issued.	
3/16/2018	SPP	Initial final report issued.	

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2015-062/IFS-2015-002-15 is for a 4.505 MW uprate generating facility located in Garfield County, Oklahoma. The Interconnection Request was studied in the DISIS-2015-002 Impact Study for Energy Resource Interconnection Service (ERIS). The Interconnection Customer's requested in-service date is March 3, 2016.

The interconnecting Transmission Owner, Oklahoma Gas and Electric Company (OKGE), performed a detailed IFS at the request of SPP. The full report is included in Appendix A. SPP has determined that full Interconnection Service will be available after the assigned Transmission Owner Interconnection Facilities, Non-Shared Network Upgrades, and Shared Network Upgrades are completed.

The primary objective of the IFS is to identify necessary Transmission Owner Interconnection Facilities, Network Upgrade(s), other direct assigned upgrade(s), and associated upgrade lead times needed to grant the requested Interconnection Service at the specified Point of Interconnection (POI).

PHASE(S) OF INTERCONNECTION SERVICE

It is not expected that Interconnection Service will occur in phases. However, Interconnection Service will not be available until all Interconnection Facilities and Network Upgrade(s) can be placed in service.

CREDITS/COMPENSATION FOR AMOUNTS ADVANCED FOR NETWORK UPGRADE(S)

Interconnection Customer shall be entitled to compensation in accordance with Attachment Z2 of the SPP OATT for the cost of SPP Network Upgrades, including any tax gross-up or any other tax-related payments associated with the Network Upgrades, that are not otherwise refunded to the Interconnection Customer. Compensation shall be in the form of either revenue credits or incremental Long Term Congestion Rights (iLTCR).

INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES

The Generating Facility is proposed to consist of uprating fifty-three (53) 1.715 MW General Electric (G.E.) wind generators to fifty-three (53) 1.80 MW G.E. wind generators for a total generating nameplate capacity of 4.505 MW uprate.

The Interconnection Customer's Interconnection Facilities to be designed, procured, constructed, installed, maintained, and owned by the Interconnection Customer at its sole expense include:

- A 34.5kV collector system;
- Two (2) 138/34.5kV 69/92/115 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- A seven (7) mile overhead 138kV line to connect the Interconnection Customer's substation to the POI at the 138kV bus at the existing OKGE substation ("Breckinridge") that is owned and maintained by OKGE ;
- All transmission facilities required to connect the Interconnection Customer's substation to the POI;

Southwest Power Pool, Inc.

- Equipment at the Interconnection Customer’s substation necessary to maintain a power factor at the POI between 95% lagging and 95% leading, including approximately 4.6Mvars¹ of reactors to compensate for injection of reactive power into the transmission system under no/reduced generating conditions. The Interconnection Customer may use wind turbine manufacturing options for providing reactive power under no/reduced generation conditions. The Interconnection Customer will be required to provide documentation and design specifications demonstrating how the requirements are met.

The Interconnection Customer shall coordinate relay, protection, control, and communication system configurations and schemes with the Transmission Owner.

TRANSMISSION OWNER INTERCONNECTION FACILITIES AND NON-SHARED NETWORK UPGRADE(S)

To facilitate interconnection, the interconnecting Transmission Owner will perform work as shown below necessary for the acceptance of the Interconnection Customer’s Interconnection Facilities.

Error! Reference source not found. lists the Interconnection Customer’s estimated cost responsibility for Transmission Owner Interconnection Facilities (TOIF) and Non-Shared Network Upgrade(s) and provides an estimated lead time for completion of construction. The estimated lead time begins when the Generator Interconnection Agreement has been fully executed.

Table 1: Interconnection Customer TOIF and Non-Shared Network Upgrade(s)

TOIF and Non-Shared Network Upgrades Description	Allocated Cost Estimate (\$)	Allocated Percent (%)	Total Cost Estimate (\$)	Estimated Lead Time
<u>Currently none</u>	\$0	N/A	\$0	N/A
Total	\$0	N/A	\$0	

SHARED NETWORK UPGRADE(S)

The Interconnection Customer’s share of costs for Shared Network Upgrades is estimated in **Error! Reference source not found.** below.

Table 2: Interconnection Customer Shared Network Upgrades

Shared Network Upgrades Description	Allocated Cost Estimate (\$)	Allocated Percent (%)	Total Cost Estimate (\$)
GEN-2015-063 Tap – Mathewson 345kV circuit #1 Replace 117 structures to achieve conductor limit	\$19,533	0.41	\$4,715,335
Total	\$19,533	0.41	\$4,715,335

¹ This approximate minimum reactor amount is needed for the current configuration of the wind farm as studied in the DISIS-2015-002 Impact Study.

All studies have been conducted assuming that higher-queued Interconnection Request(s) and the associated Network Upgrade(s) will be placed into service. If higher-queued Interconnection Request(s) withdraw from the queue, suspend or terminate service, the Interconnection Customer's share of costs may be revised. Restudies, conducted at the customer's expense, will determine the Interconnection Customer's revised allocation of Shared Network Upgrades.

OTHER NETWORK UPGRADE(S)

Certain Other Network Upgrades are currently not the cost responsibility of the Interconnection Customer but will be required for full Interconnection Service.

1) GEN-2012-033 Interconnection Facilities

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

CONCLUSION

After all Interconnection Facilities and Shared Network Upgrades have been placed into service, Interconnection Service for 4,505 MW uprate can be granted. Interconnection Service will be delayed until the Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades are completed. The Interconnection Customer's estimated cost responsibility for Transmission Owner Interconnection Facilities, Non-Shared Network Upgrades is summarized in the table below.

Description	Allocated Cost Estimate (\$)
Transmission Owner Interconnection Facilities	\$0
Network Upgrades	\$19,533
Total	\$19,533

A draft Generator Interconnection Agreement will be provided to the Interconnection Customer consistent with the final results of this IFS report. The Transmission Owner and Interconnection Customer will have 60 days to negotiate the terms of the GIA consistent with the SPP OATT.

APPENDICES

A: TRANSMISSION OWNER'S INTERCONNECTION FACILITIES STUDY REPORT

See next page for the Transmission Owner's Interconnection Facilities Study Report.



FACILITY STUDY

for

Generation Interconnection Request 2015-062

4.505 MW Addition to Existing Wind Generating Facility
In Garfield County
Near
Breckenridge, Oklahoma

January 13, 2016

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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-2015-062. 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 request is for adding 4.505 MW to an existing Point of Interconnection. There are no requirements for addition of 4.505 MW to the existing Point of Interconnection. No new or additional facilities are necessary to accommodate the additional generation.

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Introduction

The Southwest Power Pool has requested a Facility Study for the purpose of interconnecting an additional 4.505 MW of wind generation to an existing Point of Interconnection within the service territory of OG&E Electric Services (OKGE) in Garfield County Oklahoma. The proposed 138kV point of interconnection is at the existing Breckinridge Substation in Garfield County. This substation is owned by OKGE.

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. There are no requirements for additional interconnection facilities at the existing Breckinridge Substation.

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 4.505 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-2015-062 interconnection.

Table 1: Required Interconnection Network Upgrade Facilities

Facility	ESTIMATED COST (2016 DOLLARS)
OKGE – Interconnection Facilities - No new interconnection facilities necessary	\$0
OKGE – Network Upgrades No new network upgrades necessary	\$0
OKGE - Right-of-Way	No Additional ROW
Total	\$0

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January 13, 2016

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Breckinridge Substation

