



**INTERCONNECTION
FACILITIES STUDY
REPORT**

GEN-2018-032

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
January 26, 2024	SPP	Initial draft report issued.
February 8, 2024	SPP	Final report issued.
February 27, 2024	SPP	UID 156175 cost revised. Evergy FS updated.
April 11, 2024	SPP	UIDs 156174 & 156175 lead times updated per revised FS. Evergy FS updated.
October 2, 2024	SPP	Tables 3, 4, & 6 updated to reflect Restudy results.

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2018-032 is for a 310 MW generating facility located in McPhearson, KS. The Interconnection Request was studied in the DISIS-2018-001 Impact Study for ER. The Interconnection Customer's requested in-service date is October 1, 2026.

The interconnecting Transmission Owner, Evergy (WERE), 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 (TOIF), Non-Shared Network Upgrades, Shared Network Upgrades, Contingent Network Upgrades, and Affected System Upgrades that are required for full interconnection service are completed.

The primary objective of the IFS is to identify necessary Transmission Owner Interconnection Facilities, Network Upgrades, other direct assigned upgrades, cost estimates, and associated upgrade lead times needed to grant the requested Interconnection Service.

PHASE(S) OF INTERCONNECTION SERVICE

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

COMPENSATION FOR AMOUNTS ADVANCED FOR NETWORK UPGRADE(S)

FERC Order ER20-1687-000 eliminated the use of Attachment Z2 revenue crediting as an option for compensation. The Incremental Long Term Congestion Right (ILTCR) process will be the sole process to compensate upgrade sponsors as of July 1st, 2020.

INTERCONNECTION CUSTOMER INTERCONNECTION FACILITIES

The Generating Facility is proposed to consist of Seventy-four (74) VESTAS V163 4.5 MW WTG for a total generating nameplate capacity of 310 MW.

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

- 34.5 kV underground cable collection circuits;
- 34.5 kV to 345 kV transformation substation with associated 34.5 kV and 345 kV switchgear;
- Two 345/34.5 kV 125/166/207 MVA (ONAN/ONAF/ONAF) step-up transformers to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 10 miles overhead kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 345 kV bus at existing Transmission Owner substation ("Neosho 345kV Substation") that is owned and maintained by Transmission Owner;
- All transmission facilities required to connect the Interconnection Customer's substation to the POI;
- Equipment at the Interconnection Customer's substation necessary to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 95% lagging and 95% leading in accordance with Federal Energy Regulatory Commission (FERC) Order 827. The Interconnection Customer may use inverter 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; and,
- All necessary relay, protection, control and communication systems required to protect Interconnection Customer's Interconnection Facilities and Generating Facilities and coordinate with Transmission Owner's relay, protection, control and communication systems.

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.

Table 1 and **Table 2** 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: Transmission Owner Interconnection Facilities (TOIF)

Transmission Owner Interconnection Facilities (TOIF)	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>Transmission Owner's Neosho 345kV Substation GEN-2018-032 Interconnection (TOIF) (EKC) (UID156174): Facilitate the interconnection of GEN-2018-032 Estimated Lead Time: 56 Months</u>	\$1,325,113	100.00%	\$1,325,113
Total	\$1,325,113		\$1,325,113

Table 2: Non-Shared Network Upgrade(s)

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>Transmission Owner's Neosho 345kV Substation Interconnection Expansion (DISIS-2018-001) (UID156175): Facilitate the interconnection of GEN-2018-032 Estimated Lead Time: 56 Months</u>	Ineligible	\$2,764,794	100.00%	\$2,764,794
Total		\$2,764,794		\$2,764,794

SHARED NETWORK UPGRADE(S)

The Interconnection Customer’s share of costs for Shared Network Upgrades is estimated in **Table 3** below.

Table 3: Interconnection Customer Shared Network Upgrade(s)

Shared Network Upgrades Description	ILTCR	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>N/A</u>				
Total		N/A		N/A

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.

CONTINGENT NETWORK UPGRADE(S)

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

Table 4: Interconnection Customer Contingent Network Upgrade(s)

Contingent Network Upgrade(s) Description	Current Cost Assignment	Estimated In-Service Date
Line - Wolf Creek - Blackberry 345 kV: Build a new 345kV line from Wolf Creek to Blackberry with a summer emergency rating of 1792 MVA. Install terminal equipment at Wolf Creek to support 345kV line from Wolf Creek to Blackberry rated at 1792 MVA (NTC - 210592/210626)	\$0	7/15/2025

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 Contingent Network Upgrades.

AFFECTED SYSTEM UPGRADE(S)

To facilitate interconnection, the Affected System Transmission Owner will be required to perform the facilities study work as shown below necessary for the acceptance of the Interconnection Customer’s Interconnection Facilities. **Table 5** displays the current impact study costs provided by either MISO or AECI as part of the Affected System Impact review. The Affected System facilities study could provide revised costs and will provide each Interconnection Customer’s allocation responsibilities for the upgrades.

Table 5: Interconnection Customer Affected System Upgrade(s)

Affected System Upgrades Description	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
<u>N/A</u>			
Total	N/A		N/A

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 310 MW can be granted. Full Interconnection Service will be delayed until the TOIF, Non-Shared NU, Shared NU, Contingent NU, Affected System Upgrades that are required for full interconnection service are completed. The Interconnection Customer’s estimated cost responsibility for full interconnection service is summarized in the table below.

Table 6: Cost Summary

Description	Allocated Cost Estimate
Transmission Owner Interconnection Facilities Upgrade(s)	\$1,325,113
Non-Shared Network Upgrade(s)	\$2,764,794
Shared Network Upgrade(s)	\$0
Affected System Upgrade(s)	\$0
Total	\$4,089,907

Use the following link for Quarterly Updates on upgrades from this report: <https://spp.org/spp-documents-filings/?id=18641>

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 Open Access Transmission Tariff (OATT).

APPENDICES

**A: TRANSMISSION OWNER'S INTERCONNECTION FACILITIES STUDY
REPORT AND NETWORK UPGRADES REPORT(S)**

See next page for the Transmission Owner's Interconnection Facilities Study Report and Network Upgrades Report(s).



Interconnection Facilities Study

**Costs associated with
DISIS-2018-001
GEN-2018-032
Rev. 2**

April 2024

Introduction

This report summarizes the scope of the Interconnection Facilities Analysis for Network Upgrade(s) to determine costs related to the addition of the SPP-GI DISIS-2018-001 Interconnection Request(s). Evergy, as a TO, is receiving an unprecedented amount of GI interconnect requests. The cost estimates and interconnect information supplied are based on current system configuration. There are many cases of multiple GI's requesting POIs at the same substation. Ongoing changes in Evergy's transmission system configuration could affect the required system upgrades and costs necessary to meet any particular GI interconnect request in the future.

Southwest Power Pool Generation Interconnection Request:

Per the SPP Generator Interconnection Procedures (GIP), SPP has requested that Evergy perform an Interconnection Facilities Study (IFS) for Network Upgrade(s) in accordance with the Scope of Interconnection Facilities Study GIP Section 8.10 and the Interconnection Facilities Study Procedures in accordance with GIP Section 8.11 for the following Interconnection Request(s):

Upgrade Type	UID	Upgrade Name	Lead Time	DISIS Cost Estimate
Interconnection	156174	Neosho 345kV Substation GEN-2018-032 Interconnection (TOIF) (EKC)	56	\$1,325,114
Interconnection	156175	Neosho 345kV Substation Interconnection Expansion (DISIS-2018-001)	56	\$2,764,794

Neosho 345kV Substation GEN-2018-032 Interconnection (TOIF) (EKC)

345kV Substation

TOIF costs for one 345kV line terminal at Neosho 345kV substation to accommodate GEN-2018-032 (310 MW of Wind). UID 156174

Total Cost

The total cost estimate for this TOIF is:

\$	0	Transmission Line
\$	1,321,151	Substation
\$	3,963	AFUDC
\$	0	Contingency
\$	1,325,114	Total

This estimate is accurate to +/- twenty (20) percent, based on current prices, in accordance with Attachment A of Appendix 4 of the Interconnection Facilities Study Agreement. However, recent cost fluctuations in materials are very significant and the accuracy of this estimate at the time of actual settings cannot be assured.

Time Estimate

Time estimates are based on current version of the project schedule and some processes of each category run concurrently.

Engineering Time	48-56	Months
Procurement Time	48-56	Months
Construction Time	48-56	Months
<hr/> Total Project Length	48-56	Months

Neosho 345kV Substation Interconnection Expansion (DISIS-2018-001)

345kV Substation Interconnection Expansion

Network Upgrades for an interconnection expansion to accommodate GEN-2018-032 (310 MW of Wind). This estimate is the cost associated with building a new 345kV rung, including two (2) breakers and four (4) switches, in the middle of the existing breaker and half at the Neosho 345kV Substation for the GEN-2018-032 line terminal. The GI deadend would be just outside the fence, west of the terminal and in-line with the 345kV deadends, sitting both to the north and the south of the new position. Evergy would construct and own the conductor from the GI deadend outside the fence to the sub deadend inside the fence. Gen-tie could continue straight west for a minimum of 750' past the GI owned deadend and continue west or northwest from this point. UID 156175

Total Cost

The total cost estimate for this NU is:

\$	0	Transmission Line
\$	2,756,525	Substation
\$	8,269	AFUDC
\$	0	Contingency
<hr/>		
\$	2,764,794	Total

This estimate is accurate to +/- twenty (20) percent, based on current prices, in accordance with Attachment A of Appendix 4 of the Interconnection Facilities Study Agreement. However, recent cost fluctuations in materials are very significant and the accuracy of this estimate at the time of actual settings cannot be assured.

Time Estimate

Time estimates are based on current version of the project schedule and some processes of each category run concurrently.

Engineering Time	48-56	Months
Procurement Time	48-56	Months
Construction Time	48-56	Months
<hr/> Total Project Length	48-56	Months

Figure 1 –Neosho 345kV Substation

