



INTERCONNECTION FACILITIES STUDY REPORT

GEN-2020-072

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2020-072 is for a 150 MW generating facility located in Windsor, MO. The Interconnection Request was studied in the DISIS-2020-001 Impact Study for NRIS. The Interconnection Customer's requested in-service date is 12/1/2027.

The interconnecting Transmission Owner, Evergy Kansas Central, Inc. (GMO), 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 forty-eight (48) Power Electronics FS3430, HEM Series solar inverters and fifty-one (51) Power Electronics FP3430 storage inverters for a total generating nameplate capacity of 150 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 161 kV transformation substation with associated 34.5 kV and 161 kV switchgear;
- One 161 kV/34.5 kV 100/133/166.7 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 0.2 mile overhead 161 kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 161 kV bus at existing Transmission Owner substation ("Windsor to AEC Sedalia 161 kV line") 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** list 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 Windsor to AEC Sedalia 161 kV line GEN-2020-072 Interconnection (TOIF) (UID156987): Interconnection upgrades and cost estimates needed to interconnect the following Interconnection Customer facility, GEN-2020-072 (150/Hybrid), into the Point of Interconnection (POI) at Windsor to AEC Sedalia 161 kV line. Estimated Lead Time: 48 Months</u>	\$1,718,484	100.00%	\$1,718,484
Total	\$1,718,484		\$1,718,484

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 Windsor to AEC Sedalia 161 kV line GEN-2020-072 Interconnection (UID156986): Interconnection upgrades and cost estimates needed to interconnect the following Interconnection Customer facility, GEN-2020-072 (150/Hybrid), into the Point of Interconnection (POI) at Windsor to AEC Sedalia 161 kV line. Estimated Lead Time: 48 Months</u>	Ineligible	\$14,220,207	100.00%	\$14,220,207
Total		\$14,220,207		\$14,220,207

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>NA</u>				
Total		\$0		\$0

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 (122598): Build a new 345kV line from Wolf Creek to Blackberry with a summer emergency rating of 1792 MVA.	\$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 (\$)
AECI - Upgrade bushing CTs, breaker switchers on Sylvan-Sedalia 69 kV line (at Sedalia) to 1200 amp rating. Estimated Lead Time: 30 Months	\$350,000	45.52%	\$159,334
AECI - Rebuild 69 kV 6.31 mile long line from Coffman Bend - J-7 to 795 ACSR rated at 100C. Estimated Lead Time: 48 Months	\$5,900,000	41.37%	\$2,440,680
Total	\$6,250,000		\$2,600,014

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 150 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)	\$1,718,484
Non-Shared Network Upgrade(s)	\$14,220,207
Shared Network Upgrade(s)	\$0
Affected System Upgrade(s)	\$2,600,014
Total	\$18,538,705

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-2020-001
GEN-2020-072**

April 2025

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-2020-001 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	156986	Windsor to AEC Sedalia 161 kV line GEN-2020-072 Interconnection (Non-shared NU) (GMO)	48	\$14,220,207
Interconnection	156987	Windsor to AEC Sedalia 161 kV line GEN-2020-072 Interconnection (TOIF) (GMO)	48	\$1,718,484

Windsor to AEC Sedalia 161 kV line (AECI) GEN-2020-072 Interconnection (TOIF)

161kV Substation

TOIF costs for a greenfield 161kV ring bus substation tapping the Windsor to AEC Sedalia 161kV line (AECI) to accommodate GEN-2020-072 (150 MW Solar/Storage).
UID 156987

Total Cost

The total cost estimate for this TOIF is:

\$	0	Transmission Line
\$	1,566,151	Substation
\$	5,140	AFUDC
\$	147,193	Contingency
\$	1,718,484	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	36-48	Months
Procurement Time	36-48	Months
Construction Time	36-48	Months
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Total Project Length	36-48	Months

Windsor to AEC Sedalia 161 kV line (AECI) GEN-2020-072 Interconnection (NU)

161kV Substation

Network upgrade costs for a greenfield 161kV ring bus substation tapping the Windsor to AEC Sedalia 161kV line (AECI) to accommodate GEN-2020-072 (150 MW Solar/Storage). UID 156986

Total Cost

The total cost estimate for this NU is:

\$	1,491,210	Transmission Line
\$	11,584,311	Substation
\$	41,344	AFUDC
\$	1,103,342	Contingency
<hr/>		
\$	14,220,207	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	36-48	Months
Procurement Time	36-48	Months
Construction Time	36-48	Months
<hr/>		
Total Project Length	36-48	Months

Figure 1 –Windsor-Sedalia 161kV Line (AECI)

