



INTERCONNECTION FACILITIES STUDY REPORT

GEN-2021-101

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
August 22, 2025	SPP	Initial draft report issued.
September 9, 2025	SPP	Final report issued.

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2021-101 is for a 159 MW generating facility located in Douglas County, KS. The Interconnection Request was studied in the DISIS-2021-001 Impact Study for ERIS/NRIS. The Interconnection Customer's requested in-service date is 9/1/2025.

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 forty-nine (49) 3.6 MW Sungrow SG3600U inverters for a total generating nameplate capacity of 159 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 115 kV transformation substation with associated 34.5 kV and 115 kV switchgear;
- One 115 kV/34.5 kV 108/144/180 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 0.25 mile overhead 115 kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 115 kV bus at existing Transmission Owner substation ("Evergy's Midland Substation 115kV bus") 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 Midland Substation 115kV bus GEN-2021-101 Interconnection (TOIF) (UID 157136): Interconnection upgrades and cost estimates needed to interconnect the following IC facility, GEN-2021-101 (159/Solar), into the Point of Interconnection (POI) at Midland 115 kV Substation. Estimated Lead Time: 36 Months</u>	\$1,420,526	100.00%	\$1,420,526
Total	\$1,420,526		\$1,420,526

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 Midland Substation 115kV bus GEN-2021-101 Interconnection Expansion (Non-Shared NU) (UID 157129): Interconnection upgrades and cost estimates needed to interconnect the following IC facility, GEN-2021-101 (159/Solar), into the Point of Interconnection (POI) at Midland 115 kV Substation. Estimated Lead Time: 36 Months</u>	Ineligible	\$26,181	100.00%	\$26,181
<u>Transmission Owner's MIDLADN3 to MIDLADS3 115 kV Bus Tie Upgrade (UID 170644): Upgrade Equipment on the MIDLADN3 to MIDLADS3 115 kV bus tie to achieve a minimum rating of 298 MVA. Estimated Lead Time: 36 Months</u>	Ineligible	\$152,568	100.00%	\$152,568
Total		\$178,749		\$178,749

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>Transmission Owner's Build a new 50 MVAR cap bank at Viola 138 kV (UID 170643): Build a new 50 MVAR cap bank at VIOLA 138 kV. Estimated Lead Time: 48 Months</u>	Eligible	\$1,270,333	1.52%	\$19,301
<u>Transmission Owner's PECULR 7 to PHILL 7 345 kV Ckt 1 Terminal Upgrade (UID 170646): Upgrade Terminal Equipment at PHILL 7 345 kV to achieve a minimum rating of 880 MVA. Estimated Lead Time: 36 Months</u>	Eligible	\$233,358	3.24%	\$7,567
<u>Transmission Owner's PHILL 7 to SIBLEY 7 345 kV Ckt 1 Terminal Upgrade (UID 170647): Upgrade Terminal Equipment at PHILL 7 345 kV to achieve a minimum rating of 760 MVA. Estimated Lead Time: 36 Months</u>	Eligible	\$233,358	3.08%	\$7,185
Total		\$1,737,049		\$34,053

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
NEET's Line - Wolf Creek - Blackberry 345 kV (NTC 112509, 122598): "Build a new 345kV line from Wolf Creek to Blackberry with a summer emergency rating of 1792 MVA Install terminal equipment at Wolf Creek and re-terminate Wolf Creek - Waverly 345 kV line to support 345kV line from Wolf Creek to Blackberry rated at 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 (\$)
NA			
Total	\$0		\$0

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 159 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)	\$1,420,526
Non-Shared Network Upgrade(s)	\$178,749
Shared Network Upgrade(s)	\$34,053
Affected System Upgrade(s)	\$0
Total	\$1,633,328

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-2021-001
GEN-2021-101**

August 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-2021-001 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	DISIS Cost Estimate	DISIS Lead Time
Interconnection Expansion	157129	Midland Substation 115kV bus GEN-2021-101 Interconnection Expansion (Non-Shared NU) (EKC)	\$ 26,181.00	36 Months
Interconnection	157136	Midland Substation 115kV bus GEN-2021-101 Interconnection (TOIF) (EKC)	\$ 1,420,526.00	36 Months

Evergy's Midland Junction Substation 115kV bus GEN-2021-101

Interconnection Expansion (EKC)

115 kV Substation

Network Upgrades for connecting to one of the 115kV terminals at Midland Junction 115kV to accommodate Savion Energy GEN-2021-101 (159MW of Solar). This estimate is for the 115kV relay settings work at Midland Junction sub.
UID 157129

Total Cost

The total cost estimate for this Interconnection Expansion is:

\$	0	Transmission Line
\$	25,477	Substation
\$	79	AFUDC
\$	625	Contingency
<hr/>		
\$	26,181	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	24-36	Months
Procurement Time	24-36	Months
Construction Time	18	Months
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Total Project Length	24-36	Months

Evergy's Midland Junction Substation 115kV bus GEN-2021-101 TOIF

115 kV Substation

TOIF for connecting to one of the 115kV terminals to accommodate Savion Energy GEN-2021-101 (159MW of Solar). This estimate is for the VT's, CT's, steel, connectors, cable, conduit and other miscellaneous material required for the GEN-2021-101 interconnection 115kV Line Terminal installation at Midland Junction sub. Use cost in conjunction with the Network Upgrades estimate under the same name. UID 157136

Total Cost

The total cost estimate for this TOIF is:

\$	0	Transmission Line
\$	1,330,286	Substation
\$	4,249	AFUDC
\$	85,991	Contingency
<hr/>		
\$	1,420,526	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	12-18	Months
Procurement Time	24-36	Months
Construction Time	18	Months
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Total Project Length	24-36	Months

Figure 3 - Midland Junction 115kV Substation





Interconnection Facilities Study

**Costs associated with
DISIS-2021-001**

**Build a new 50 MVAR cap bank at
Viola 138kV
August 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-2021-001 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	DISIS Cost Estimate	DISIS Lead Time
Current Study	170643	Build a new 50 MVAR cap bank at Viola 138kV	\$ 1,270,333.00	48 Months

Build a new 50 MVAR cap bank at Viola 138kV

138kV Substation

Network Upgrades to add a new 50 MVAR cap bank at Viola 138kV. This upgrade includes installation of a new 50 MVAR capacitor bank on the 138kV bus at Viola. UID 170643

Total Cost

The total cost estimate for this Network Upgrade is:

\$	0	Transmission Line
\$	1,161,332	Substation
\$	3,800	AFUDC
\$	105,201	Contingency
<hr/>		
\$	1,270,333	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	12-18	Months
Procurement Time	48	Months
Construction Time	48	Months
Total Project Length	48	Months

Figure 1 –Viola 138kV substation





Interconnection Facilities Study

**Costs associated with
DISIS-2021-001
Peculiar-Pleasant Hill 345kV Ckt 1
Terminal Upgrade to a minimum of 880
MVA
August 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-2021-001 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	DISIS Cost Estimate	DISIS Lead Time
Current Study	170646	Peculiar-Pleasant Hill 345kV Ckt 1 Terminal Upgrade to a minimum of 880 MVA	\$ 233,358.00	36 Months

Peculiar-Pleasant Hill 345kV Ckt 1 Terminal Upgrade to a minimum of 880 MVA

345kV Substation

Network Upgrades to upgrade the Peculiar-Pleasant Hill 345kV Ckt 1 Terminal Upgrade to a minimum of 880 MVA. This upgrade includes replacing both wavetraps at the Pleasant Hill 345kV substation. UID 170646

Total Cost

The total cost estimate for this Network Upgrade is:

\$	0	Transmission Line
\$	222,359	Substation
\$	699	AFUDC
\$	10,300	Contingency
<hr/>		
\$	233,358	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	12-18	Months
Procurement Time	24-36	Months
Construction Time	24-36	Months
<hr/>		
Total Project Length	24-36	Months

Figure 1 – Peculiar-Pleasant Hill 345kV Ckt 1





Interconnection Facilities Study

**Costs associated with
DISIS-2021-001
Pleasant Hill-Sibley 345kV Ckt 1
Terminal Upgrade to a minimum of 760
MVA
August 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-2021-001 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	DISIS Cost Estimate	DISIS Lead Time
Current Study	170647	Pleasant Hill-Sibley 345kV Ckt 1 Terminal Upgrade to a minimum of 760 MVA	\$ 233,358.00	36 Months

Pleasant Hill-Sibley 345kV Ckt 1 Terminal Upgrade to a minimum of 760 MVA

345kV Substation

Network Upgrades to upgrade Pleasant Hill-Sibley 345kV Ckt 1 Terminal Upgrade to a minimum of 760 MVA. This upgrade includes replacing a wavetrap at the Pleasant Hill 345kV substation. UID 170647

Total Cost

The total cost estimate for this Network Upgrade is:

\$	0	Transmission Line
\$	222,359	Substation
\$	697	AFUDC
\$	10,300	Contingency
<hr/>		
\$	233,358	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	12-18	Months
Procurement Time	24-36	Months
Construction Time	24-36	Months
Total Project Length	24-36	Months

Figure 1 – Pleasant Hill-Sibley 345kV Ckt 1

