INTERCONNECTION FACILITIES STUDY REPORT

GEN-2021-042

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
August 19, 2025	SPP	Initial draft report issued.
August 28, 2025	SPP	Final report issued.

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2021-042 is for a 50 MW generating facility located in Jackson, MO. The Interconnection Request was studied in the DISIS-2021-001 Impact Study for ERIS/NRIS. The Interconnection Customer's requested in-service date is 6/1/2028.

The interconnecting Transmission Owner, Independence Power & Light (INDN), 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 thirty-four (34) 2.992298 MW Power Electronics FP3510M inverters for a total generating nameplate capacity of 50 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;
- Two 161 kV/34.5 kV 40/54/67 MVA (ONAN/ONAF/ONAF) step-up transformers to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 0.28 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 ("Independence Power & Light, Blue Valley Substation, 161kV 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 ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Transmission Owner's Blue Valley 161 kV Substation GEN-2021-042 Interconnection (TOIF) (UID 157073): Interconnection upgrades and cost estimates needed to interconnect the following IC facility, GEN-2021-042 (50/Battery/Storage), into the Point of Interconnection (POI) at Blue Valley 161 kV Substation. Estimated Lead Time: 0 Months	$0	100.00%	$0
Total	**$0**		**$0**

Table 2: Non-Shared Network Upgrade(s)

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Transmission Owner's Blue Valley 161 kV Substation GEN-2021-042 Interconnection (Non-shared NU) (UID 157074): Interconnection upgrades and cost estimates needed to interconnect the following IC facility, GEN-2021-042 (50/Battery/Storage), into the Point of Interconnection (POI) at Blue Valley 161 kV Substation. Cost and lead times contingent upon the interconnection of GEN-2018-031. Estimated Lead Time: 0 Months	Ineligible	$100,000	100.00%	$100,000
Total		**$100,000**		**$100,000**

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 ($)	Allocated Percent (%)	Allocated Cost Estimate ($)
Evergy'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	Eligible	$1,270,333	0.44%	$5,579
Total		**$1,270,333**		**$5,579**

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
NA		

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 50 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)	$0
Non-Shared Network Upgrade(s)	$100,000
Shared Network Upgrade(s)	$5,579
Affected System Upgrade(s)	$0
Total	**$105,579**

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).

Independence Power & Light

FACILITY STUDY FOR SOUTHWEST POWER POOL
GENERATOR INTERCONNECTION REQUEST
GEN-2021-042

August 2025

Introduction

Pursuant to the Southwest Power Pool (SPP) Open Access Transmission Tariff (Tariff) and at the request of SPP, Independence Power & Light (IPL) performed the following Facility Study for the following Interconnection and/or Network Upgrade(s) to satisfy the Facility Study Agreement executed by the requesting Interconnection Customer (Customer) for SPP Generation Interconnection Request **GEN-2021-042**.

Upgrade Type	**Upgrade ID**	**Description**
Interconnection	157073	Blue Valley 161kV Substation GEN-2021-042 Interconnection (TOIF) (INDN)
Interconnection	157074	Blue Valley 161kV Substation GEN-2021-042 Interconnection (Non-shared NU) (INDN)

The request for interconnection was placed with SPP in accordance with the Tariff, which covers new generation interconnections on SPP member's transmission system. The Customer requests interconnection service for a 50MW battery storage facility. The requirements for interconnection consist of no changes to the existing IPL Substation A 161kV ring bus.

The Facility Study does not guarantee the availability of transmission service necessary to deliver the additional generation to any specific point inside or outside the SPP transmission system. The transmission network facilities may not be adequate to deliver additional generation output to the transmission system. If the Customer requests firm transmission service under the SPP Tariff at a future date, Network Upgrades or other new construction may be required to provide the service requested under the SPP Tariff.

Study Requirements

IPL has performed this Facility Study report in accordance with the Generator Interconnection Procedures (GIP), Attachment V, Section 8.11 for the noted Interconnection and/or Network Upgrade(s).

The Facility Study report includes an evaluation of the following:

- Develop/compile cost estimates for all labor, overheads, equipment additions, modifications, etc. to accommodate the generator interconnection.
- Develop an overall construction schedule for completion of the necessary additions and/or modifications.

- Point Of Change of Ownership. For the purposes of this Facility Study report, the Point of Change of Ownership location is defined as the take-off structure(s) at the IPL Substation/Switching Station where the Interconnection Customer's transmission line(s) connects to the take-off structure(s). Interconnection Customer will furnish and install the conductor jumper and insulator assembly to the take-off structure(s).
- Other Interconnection/Metering Requirements. Basic indication, metering, monitoring, control, and relaying requirements due to a generator interconnection are included in the cost estimate. IPL's generation metering requirements, as an SPP Transmission Owner, must be met. A list of specific needs will be provided by IPL once design has progressed. Interconnection customer is to install metering equipment at the Collector station.

Cost & Time Estimates

Cost estimates are accurate to +/- twenty (20) percent, based on current prices, in accordance with Section 8.11 of the Attachment V Generator Interconnection Procedures (GIP). However, cost fluctuations in materials are significant and the accuracy of this estimate at the time of actual procurement and construction cannot be assured.

The interconnection is anticipated to utilize the same point at Substation A as the GEN-2018-031 development. No upgrades to IPL's equipment at Substation A are required for the projected generation addition. The cost estimates provided are general in nature and account for miscellaneous coordination activities and are contingent on the construction and commercial operation date (COD) of the GEN-2018-031 project in which it shares the gen-tie/interconnection point.

GEN-2021-042

IPL Substation A

Transmission Owner Interconnection Facilities (TOIF)

TOIF at the IPL Substation A include:

- N/A

TOIF Cost	$ -

Non-Shared Network Upgrades

Non-Shared Network Upgrades at IPL Substation A include:

- The cost estimate provided is general in nature and accounts for miscellaneous coordination activities and is contingent on the construction and commercial operation date (COD) of the GEN-2018-031 project in which it shares the gen-tie/interconnection point.

Non-Shared Network Upgrades Cost $100,000

Time Estimate

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

Activity	Duration
Engineering	N/A
Procurement	N/A
Construction	N/A
Total Project Length	**N/A**

Short Circuit Fault Duty Evaluation

IPL reviewed short circuit analysis for the Sub A 161 kV substation to determine if the addition of GEN-2021-042 would cause the available fault currents to exceed the interrupting capability of any existing circuit breakers. The review found fault currents within circuit breaker interrupting capability with the addition of the GEN-2021-042.

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
$	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