



**INTERCONNECTION  
FACILITIES STUDY  
REPORT**

GEN-2023-SR22

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By SPP Generator Interconnections Dept.

## REVISION HISTORY

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DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
03/19/2024	SPP	Initial draft report issued.
04/17/2024	SPP	Final Report Issued

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# SUMMARY

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## INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2023-SR22 is for a 124.7 MW generating facility located in Mayes County, Oklahoma. The Interconnection Request was studied in the Surplus Impact Study for ERIS. The Interconnection Customer's requested in-service date is December 6, 2024.

The interconnecting Transmission Owner, American Electric Power Southwest Transmission Planning (AEP), 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 Surplus Generating Facility (SGF) is proposed to consist of thirty-five (35) PE FP4200M2 Battery Energy Storage System (BESS) inverters operating at 3.5888 MW for a total assumed dispatch of 125.608 MW. The inverters are rated at 4.2 MW, thus the generating capability of the SGF (147 MW) will be controlled thru the use of a Power Plant Controller (PPC) to limit the injection amount of the SGF to 124.7 MW at the POI.

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;
- The project will connect to the existing GEN-2017-077 main collection substation and share its main power transformer to connect to the Point of Interconnection (POI) at the 138 kV bus at existing Transmission Owner substation (Cooyyah 138 kV) that is owned and maintained by Transmission Owner;
- 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)*

<b>Transmission Owner Interconnection Facilities (TOIF)</b>	<b>Total Cost Estimate (\$)</b>	<b>Allocated Percent (%)</b>	<b>Allocated Cost Estimate (\$)</b>	<b>Estimated Lead Time</b>
<b><u>Cooyah 138 kV GEN-2023-SR22 (159059):</u></b> Add Sub-metering, CT/PTs, and other associated equipment.	\$200,210	100%	\$200,210	18 Months
<b>Total</b>	<b>\$200,210</b>		<b>\$200,210</b>	

*Table 2: Non-Shared Network Upgrade(s)*

<b>Non-Shared Network Upgrades Description</b>	<b>ILTCR</b>	<b>Total Cost Estimate (\$)</b>	<b>Allocated Percent (%)</b>	<b>Allocated Cost Estimate (\$)</b>	<b>Estimated Lead Time</b>
<b>None</b>	Eligible	\$0	%	\$0	N/A
<b>Total</b>		<b>\$0</b>		<b>\$0</b>	

**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)*

<b>Shared Network Upgrades Description</b>	<b>ILTCR</b>	<b>Total Cost Estimate (\$)</b>	<b>Allocated Percent (%)</b>	<b>Allocated Cost Estimate (\$)</b>	<b>Estimated Lead Time</b>
<b>None</b>	Eligible	\$0	%	\$0	N/A
<b>Total</b>		<b>\$0</b>		<b>\$0</b>	

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)*

<b>Contingent Network Upgrade(s) Description</b>	<b>Current Cost Assignment</b>	<b>Estimated In-Service Date</b>
<b>None</b>	\$0	N/A

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)*

<b>Affected System Upgrades Description</b>	<b>Total Cost Estimate (\$)</b>	<b>Allocated Percent (%)</b>	<b>Allocated Cost Estimate (\$)</b>
<b>None</b>	\$0	%	\$0
<b>Total</b>	\$0		\$0

## CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Surplus Interconnection Service for 124.7 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*

<b>Description</b>	<b>Allocated Cost Estimate</b>
Transmission Owner Interconnection Facilities Upgrade(s)	\$200,210
Non-Shared Network Upgrade(s)	\$0
Shared Network Upgrade(s)	\$0
Affected System Upgrade(s)	\$0
<b>Total</b>	<b>\$200,210</b>

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

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**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).



**AEP Generation Interconnection  
Facilities Study Report  
for  
Surplus  
GEN-2023-SR22  
Cooyah 138 kV  
Mayes County, Oklahoma**

**March 2024**

## 1 Facilities Study Summary

American Electric Power Southwest Transmission Planning (AEP) performed the following study at the request of the Southwest Power Pool (SPP) for SPP Generation Interconnection request GEN-2023-SR22. Per the SPP Generator Interconnection Procedures (GIP), SPP requested that AEP perform an Interconnection Facilities Studies (IFS) for Network Upgrade(s) in accordance with Section 8.11 for the following Interconnection and/or Network Upgrade(s):

### 1.1 Project Description

GEN-2023-SR22 proposes to add a 124.7 MW battery/storage generation facility at the future 138 kV Cooyah AEP station to their GEN-2017-077 POI (Figure 1) in Mayes County, Oklahoma.

### 1.2 AEP's Scope of Work to Facilitate Interconnection

- To accommodate the interconnection, work will need to be completed at the Interconnection Customer stations. Sub-metering will be needed for GEN-2023-SR22 and GEN-2017-077 since they are sharing the same gen tie line into AEP's Cooyah station.
- Settings to the protection and control equipment will need to be evaluated at the AEP 138 kV Cooyah station to determine if updates are needed. AEP reserves the right to specify the final acceptable configuration considering design practices, future expansion, and compliance requirements.
- It is understood that the Interconnection Customer is responsible for all of the connection costs associated with interconnecting GEN-2023-SR22 to the AEP transmission system.

### 1.3 Short Circuit Evaluation

- It is standard practice for AEP 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.
- In the AEP system, no breakers were found to exceed their interrupting capability after the addition of the generation and related facilities. Therefore, there are no additional short circuit upgrade costs associated with the GEN-2023-SR22 interconnection.

### 1.4 Stability Evaluation

- Based on the results of the GEN-2023-SR22 DISIS short circuit and stability report, AEP is not aware of any instances where the system does not meet TPL-001 stability performance requirements for the planning events and generation dispatch conditions that were considered in this DISIS study.

### 1.5 Interconnection Cost of Facilities Included in the Facilities Study:

Network Upgrades	\$0
Transmission Owner Interconnection Facilities (TOIF)	\$200,210
Total Cost	\$200,210

*The estimates do not include the impact that delays in obtaining ROW, permits, or other approvals may have.*

### 1.6 Project Lead time

Project in-service date is projected to be 18 months after the issuance of Authorization to Proceed from the Interconnection Customer.

Figure 1: Point of Interconnection (POI INFORMATION) One-Line Diagram

