

# **INTERCONNECTION FACILITIES STUDY REPORT**

GEN-2016-036  
(IFS-2016-002-42)

Published June 2022

By SPP Generator Interconnections Dept.

# REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
09/25/2020	SPP	Initial draft report issued.
10/06/2020	SPP	Updated customer comments and ILTCR eligibility in Table 2.
10/27/2020	SPP	Updated final report issued.
07/28/2021	SPP	Updated final report issued. Updated tables 3, 5 and 6 based on DISIS Power Flow Reposting and MISO AFS Addendum
07/30/2021	SPP	Updated table 4 to reflect the inclusion of the R-Plan
10/01/2021	SPP	Updated Tables 5 and 6 based on MISO AFS Addendum
06/06/2022	SPP	Updated Contingent Facilities and Affected Systems to reflect updated report postings

Interconnection Facilities Study Report GEN-2016-036/IFS-2016-002-42  
Southwest Power Pool, Inc.

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# SUMMARY

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## INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2016-036/IFS-2016-002-42 is for a 44.6 MW generating facility located in Chippewa County, MN. The Interconnection Request was studied in the DISIS-2016-002 Impact Study for Energy Resource Interconnection Service (ERIS). This request was restudied in the DISIS-2016-002-2 Impact Study for ERIS. Additionally, this request was studied in the Interim Availability Impact Study for GEN-2016-036. The Interconnection Customer's requested in-service date is November 19th, 2018.

The interconnecting Transmission Owner, Western Area Power Administration (WAPA), 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 two (2) GE 2.3 MW Wind Turbine Generation Systems and sixteen (16) GE 2.5 MW Wind Turbine Generation Systems for a total generating nameplate capacity of 44.6 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 115/34.5 kV 60/80/100 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- A .25 mile underground 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 ("Granite Falls 115 kV") 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 Turbine 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 (\$)	Estimated Lead Time
<b>Granite Falls 115 kV Substation GEN-2016-036 Interconnection (TOIF) - 102167:</b> Construct a 115-kV bay addition including, the installation of one 115-kV circuit breaker (JY28A/2862), two 115-kV disconnect switches (WY28A/2863, YY28B/2865), one 115-kV disconnect switch with ground blades (YY28A/2861, ZY28A/2860), one 115-kV CCVT (VY28A1), equipment supports, steel lattice beam and supports, 115-kV take-off/underground termination structure, control boards, communication equipment, and relays.	\$1,334,000	0%	\$0	N/A
<b>Total</b>	<b>\$1,334,000</b>		<b>\$0</b>	

\*Interconnection facilities were built during the Interim GIA. Upgrade is complete with an in-service date of 12/06/2018. No further cost is allocated for these facilities.

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

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

**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>
None	N/A	\$0	N/A	\$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)*

Contingent Network Upgrade(s) Description	Assignment	Service Date
None	N/A	N/A

## 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 MISO 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 Share (%)	Allocated Cost Estimate (\$)
<b><u>MISO Affected System Study:</u></b> Install 1 (one) 20 MVAR 115 kV capacitor bank, 2 (two) 115kV SF6 breakers, 3 (three) 115kV gang operated switches, 3 (three) 115kV CCVT, and support foundations.	\$808,145	2.4%	\$19,395
<b>Total</b>	<b>\$808,145</b>		<b>\$19,395</b>

## CONCLUSION

\*After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for [44.6] MW can be granted. This request is currently operating under an Interim GIA that resulted from the “Interim Availability of Interconnection System Impact Study for Generator Interconnection GEN-2016-036”. The Interconnection Customer’s estimated cost responsibility 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)	\$0
Shared Network Upgrade(s)	\$0
Affected System Upgrade(s)	\$19,395
<b>Total</b>	<b>\$19,395</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)**

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

\*The Facility Study provided by NPPD for "Antelope – Holt 345 kV CKT 1 (DISIS-2016-002) – 122699" is the total cost for the shared network upgrade. This cost will be allocated to the assigned customers in the "DISIS-2016-002 Power Flow Workbook". The assigned customers will then enter into a Shared Network Agreement with NPPD following the execution of their respective GIA(s).

