



**INTERCONNECTION
FACILITIES STUDY
REPORT**

GEN-2018-068

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By SPP Generator Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
January 31, 2025	SPP	Initial draft report issued.
February 3, 2025	SPP	Updated allocation percentages for UIDs 156668 and 158586
February 19, 2025	SPP	Final report issued.

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SUMMARY

INTRODUCTION

This Interconnection Facilities Study (IFS) for Interconnection Request GEN-2018-068 is for a 302.4 MW generating facility located in Madison, NE. The Interconnection Request was studied in the DISIS-2018-002/DISIS-2019-001 Impact Study for ER/NR. The Interconnection Customer's requested in-service date is January 4, 2027.

The interconnecting Transmission Owner, Nebraska Public Power District (NPPD), 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 ninety (90) GE 3.4-140 GEWTG0705 Wind Turbines for a total generating nameplate capacity of 302.4 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 345 kV transformation substation with associated 34.5 kV and 345 kV switchgear;
- Two 345/34.5 kV 102/136/170 MVA (ONAN/ONAF/ONAF) step-up transformer to be owned and maintained by the Interconnection Customer at the Interconnection Customer's substation;
- An Approximately 10.9 mile overhead 345 kV line to connect the Interconnection Customer's substation to the Point of Interconnection ("POI") at the 345 kV bus at existing Transmission Owner substation ("Pierce County 345 kV Substation") 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 Pierce County 345kV GEN-2018-068 Interconnection (TOIF) (NPPD) (UID 156667): Facilitate the interconnection of GEN-2018-068 Estimated Lead Time: 60 Months</u>	\$500,000	100.00%	\$500,000
Total	\$500,000		\$500,000

Table 2: Non-Shared Network Upgrade(s)

Non-Shared Network Upgrades Description	ILTCR	Total Cost Estimate (\$)	Allocated Percent (%)	Allocated Cost Estimate (\$)
NA				
Total		\$0		\$0

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 Pierce County 345kV Interconnection Expansion (DISIS-2018-002 - DISIS-2019-001) (UID 156668): Facilitate the interconnection of GEN-2018-068 Estimated Lead Time: 60 Months</u>	Ineligible	\$34,300,000	40.58%	\$13,918,940
<u>Transmission Owner's Build a Second 345-230 kV Transformer at Hoskins 345kV (UID 170507): Build a second 345/230kV transformer at Hoskins with a rating of 336 MVA Estimated lead Time: 60 Months</u>	Eligible	\$45,400,000	21.19%	\$9,620,260
<u>Transmission Owner's Build Second 345-115kV transformer at Antelope (UID 158586): Build a second 345/115kV transformer at Antelope with a rating of 417 MVA Estimated Lead Time: 60 Months</u>	Eligible	\$33,000,000	40.58%	\$13,391,400
Total		\$112,700,000		\$36,930,600

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
Antelope - Holt County 345 kV Ckt 1 New Line (2024 ITP): Build a new HOLT.CO3 to ANTELOPE 3 345 kV line 1 (24 miles) to a standard rating of 1792 MVA	\$0	TBD

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 (\$)
Midcontinent Independent System Operator “MISO” and OPPD: Raun - G18-043 Tap 345 kV	\$3,720,909	51.37%	\$1,911,574
MISO: Add 4×40 MVAR switched cap at Panther 230 kV (615529)	\$9,000,000	15.75%	\$1,417,808
MISO: Add 4×40 MVAR switched cap at McLeod 230 kV (658276)	\$5,500,000	16.50%	\$907,702
MISO: Add 1×40 MVAR switched cap at Paynesville 230 kV (602036)	\$2,000,000	15.43%	\$308,540
Total	\$20,220,909		\$4,545,624

CONCLUSION

After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 302.4 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)	\$500,000
Non-Shared Network Upgrade(s)	\$0
Shared Network Upgrade(s)	\$36,930,600
Affected System Upgrade(s)	\$4,545,624
Total	\$41,976,224

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).