



**Facility Study
For
Generator Interconnection
Request
GEN-2013-033**

*SPP Generator
Interconnection Studies*

(#GEN-2013-033)

June 2014

Revision History

Date	Author	Change Description
06/02/2014	SPP	Facility Study Report Issued

Summary

Midwest Energy, Inc. (MIDW) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2013-033 (28MW MW / Natural Gas Internal Combustion Turbines) located in Ellis County, Kansas. The originally proposed in-service date for GEN-2013-033 was December 31, 2015. Full Interconnection Service will require the Network Upgrades listed in the “Other Network Upgrades” section. The request for interconnection was placed with SPP in accordance with SPP’s Open Access Transmission Tariff, which covers new generation interconnections on SPP’s transmission system.

Phases of Interconnection Service

It is not expected that interconnection service will require phases however, interconnection service will not be available until all interconnection facilities and network upgrades can be placed in service.

Interconnection Customer Interconnection Facilities

The Interconnection Customer will be responsible for all of the transmission facilities connecting the customer owned substation to the Point of Interconnection (POI), at Midwest Energy, Inc. (MIDW) owned 115kV Knoll bus at the Knoll Substation. GEN-2013-033 will utilize the exiting generator lead for GEN-2006-031 from the Interconnection Customer owned substation to Knoll 115kV. The Interconnection Customer will also be responsible for any equipment located at the Customer substation necessary to maintain a power factor of 0.95 lagging to 0.95 leading at the POI.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

To allow interconnection the Transmission Owner has analyzed the existing terminal, breakers and associated terminal equipment for acceptance of the Interconnection Customer’s Interconnection Facilities and has determined the terminal equipment to be adequately sized to accommodate GEN-2013-033. However, during fault analysis the Transmission Owner has determined a prior system condition for circuit switches at Knoll 230kV and Vine Street 115kV could be inadequate for anticipated fault levels. GEN-2013-033 is not assigned the cost to replace the switches but its interconnection is contingent upon the replacement of the two circuit switches. At this time GEN-2013-033 is responsible for \$0.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades.

Shared Network Upgrades

The Interconnection Customer was studied within the DISIS-2013-002 Impact Study. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. If higher queued interconnection customers withdraw from the queue, suspend or terminate their GIA, restudies will have to be conducted to determine the Interconnection Customers’ allocation of Shared Network Upgrades. All studies have been conducted on the basis of higher queued interconnection requests and the upgrades associated with those higher queued interconnection requests being placed in service. At this time, the Interconnection Customer is allocated the following cost for Shared Network Upgrade:

Share Network Upgrade Description	Allocated Cost	Total Cost
None at this time	\$0.00	\$0.00

Total	\$0.00
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Other Network Upgrades

Certain Other Network Upgrades are currently not the cost responsibility of the Customer but will be required for full Interconnection Service. These Other Network Upgrades include:

1. Knoll 230kV switch (6801) and Vine Street (3807) replacement, per MIDW Facility Study
2. Spearville – Clark – Thistle – Wichita 345kV double circuit, scheduled for 12/31/2014 in-service

Depending upon the status of higher or equally queued customers, the Interconnection Customer's in-service date is at risk of being delayed or their Interconnection Service is at risk of being reduced until the in-service date of these Other Network Upgrades.

Conclusion

Interconnection Service for GEN-2013-033 will be delayed until the Network Upgrades listed in the "Other Network Upgrades" section are constructed. The Interconnection Customer is responsible for \$0.00 of Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades. At this time, the Interconnection Customer is allocated \$0.00 for Shared Network Upgrades. After all Interconnection Facilities and Network Upgrades have been placed into service, Interconnection Service for 28 MW, as requested by GEN-2013-033, can be allowed. At this time the total allocation of costs assigned to GEN-2013-033 for Interconnection Service are estimated at \$0.00.



Midwest Energy Inc.

***Facility Study for Generation Interconnection
Request GEN-2013-033***



May 29, 2014

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Study Overview

At the request of Southwest Power Pool (SPP), Midwest Energy developed the following generation interconnection facility study for request GEN-2013-033 based on the results of Definitive Interconnection System Impact Study 2013-002 (DISIS-2013-002). As studied in DISIS-2013-002, GEN-2013-033 consists of 28 MW of natural gas internal combustion generation interconnecting to the 115 kV bus at Midwest Energy's Goodman Energy Center.

The purpose of this study is to provide estimated costs of facilities required for interconnection of the proposed generation to Midwest Energy's transmission system and network upgrades required on Midwest Energy's transmission system as identified in DISIS-2013-002. Additional network upgrades required for facilities of other transmission owners are not included in this study.

Interconnection Facilities and Network Upgrades

A one-line diagram for Goodman Energy Center showing the expansion including GEN-2013-033 can be found in Attachment A. Existing 115 kV infrastructure and generator step up transformers at Goodman Energy Center are currently sized to accommodate the 28 MW expansion without additional transmission interconnection or network upgrades.

Fault Analysis

In addition to the power flow and stability analyses detailed in DISIS-2013-002, Midwest Energy conducted a fault study to determine if the addition of the proposed generation and contingent system upgrades caused fault levels on the Midwest Energy transmission system to exceed interrupting device capabilities. The results of the fault analysis indicate that fault levels in the area are minimally affected by the addition of GEN-2013-033. However, two fault interrupting devices were identified as overdutied prior to the addition of GEN-2013-033. Interrupting ratings of Knoll 230 kV circuit switcher 6801 and Vine Street 115 kV circuit switcher 3807 are inadequate for anticipated fault levels on the planned transmission system when GEN-2013-033 is expected to be placed in service. Midwest Energy considers addition of GEN-2013-033 contingent upon replacement of circuit switchers 6801 and 3807, but costs associated with these devices should not be attributed to GEN-2013-033.

Summary

The facility study conducted by Midwest Energy did not identify any upgrades to the Midwest Energy transmission system that must be completed in order to connect the additional 28MW of generation at Goodman Energy Center, nor are there any upgrades to Midwest Energy's system for which the cost is allocable to GEN-2013-033. Table 1 provides an estimate of the costs of construction for the Transmission Owner's Interconnection Facilities and Network Upgrades in support of a future Generation Interconnection Agreement pursuant to GEN-2013-033.

Facility Study for Generation Interconnection Request GEN-2013-033

Table 1 - Interconnection Facility and Network Upgrade Cost Estimate

Description	Total Cost
Interconnection Facilities	\$ 0
Midwest Energy Network Upgrades	
None	\$ 0
Total Interconnection Facilities and Network Upgrades	\$ 0

Attachment A

Goodman Energy Center with GEN-2013-033 Addition

