



***Facility Study
For
Generation Interconnection
Request
GEN-2006-006***

SPP Tariff Studies

(#GEN-2006-006)

March 2010

Summary

Mid Kansas Power Company, LLC (MKEC) performed the following Study at the request of the Southwest Power Pool (SPP) for Generation Interconnection request Gen-2006-006. The request for interconnection was placed with SPP in accordance SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system.

Pursuant to the tariff, MKEC was asked to perform a detailed Facility Study of the generation interconnection request to satisfy the Facility Study Agreement executed by the requesting customer and SPP.

Interconnection Customer Interconnection Facilities

The Interconnection Customer will be responsible for the 230kV transmission line from the point of interconnection to its 230/34.5kV substation that will contain its 230/34.5kV transformer(s) and wind turbine collector feeders. In addition, the Customer will be required to maintain a +/- 95% power factor leading/lagging at the point of interconnection (MKEC Spearville 230kV substation).

Transmission Owner Interconnection Facilities and Non Shared Network Upgrades

Per the following Facility Study, the Interconnection Customer is responsible for \$5,447,000 of Transmission Owner Interconnection Facilities and \$6,400,000 of non shared Network Upgrades.

Shared Network Upgrades

The GEN-2006-006 Interconnection Customer is included in the 1st Cluster Study approved in FERC Docket #ER09-262. The Interconnection Customer's shared upgrade costs are \$27,340,197. This cost is subject to change depending upon the Facility Study for the shared network upgrades. This cost is also subject to change for restudies conducted by the Transmission Provider in response to the higher queued customers or other customers in the 1st Cluster that withdraw their interconnection request or suspend, terminate, or request unexecuted filings of their LGIAs.

Executive Summary

<OMITTED TEXT> (Customer) has requested a Facility Study under the Southwest Power Pool Open Access Transmission Tariff (OATT) for interconnecting a 205.5 MW wind powered generation facility in Ford County, Kansas to the transmission system of Mid Kansas Power Company, LLC (MKEC). The wind powered generation facility studied was proposed to comprise of one-hundred-thirty-seven (137) General Electric 1.5 MW wind turbines. The wind powered generation facility will interconnect into the 230kV bus at Spearville substation.

The generation facility was studied to interconnect into the MKEC Spearville 230kV substation. MKEC has proposed to build a new 230kV ring bus adjacent to the existing 230kV substation. This is necessary as the existing 230kV substation ring bus cannot be expanded any further. A second 345/230kV autotransformer at Spearville is needed for interconnection. The Interconnection Customer's non shared network upgrades and interconnection facilities are estimated at \$11,847,000. The Interconnection Customer's shared network upgrades are estimated at \$24,116,276.

The Customer will have certain facility requirements in their substation to interconnect the generation facility. The Customer will be required to maintain a +/-95% power factor leading/lagging at the point of interconnection.

1. Introduction

<OMITTED TEXT> (Customer) has requested a Facility Study under the Southwest Power Pool Open Access Transmission Tariff (OATT) for interconnecting a 205.5 MW wind powered generation facility in Ford County, Kansas to the transmission system of Mid Kansas Power Company, LLC (MKEC). The wind powered generation facility studied was proposed to comprise of one-hundred-thirty-seven (137) General Electric 1.5 MW wind turbines. The wind powered generation facility will interconnect into the 230kV bus at Spearville substation.

2. Interconnection Facilities and Non Shared Network Upgrades

All required interconnection facilities are tabulated in Table 2 and are shown in Figure 1.

- 2.1. **Spearville 230kV Substation** - The Customer will be interconnecting into a new 230kV ring bus substation adjacent to the existing Spearville 230kV ring bus. A new ring bus is necessary as the existing 230kV ring bus cannot be expanded any further. A new 230kV line terminal to the wind farm will be added to the proposed ring bus.
- 2.2. **Spearville 345/230kV Autotransformer** - MKEC will be installing a second 345/230kV transformer as part of the interconnection for the GEN-2006-006 interconnection request. MKEC will install a 180/240/300MVA autotransformer with tertiary reactor. Construction will be performed on both the 345kV yard and the new 230kV ring bus for the installation of this autotransformer.

The costs for the Interconnection Facilities and non shared Network Upgrades is listed below in Table 1. The one-line diagram is shown in Figure 1.

Table 1: Required Interconnection Facilities and Non Shared Network Upgrades

Project	Description	Estimated Cost
1	Add 230kV ring bus and 230kV line position to interconnect GEN-2006-006 wind farm.	\$5,447,000
2	Add 345/230kV 180/240/300 MVA autotransformer at Spearville substation	\$6,400,000
	Total:	\$11,847,000

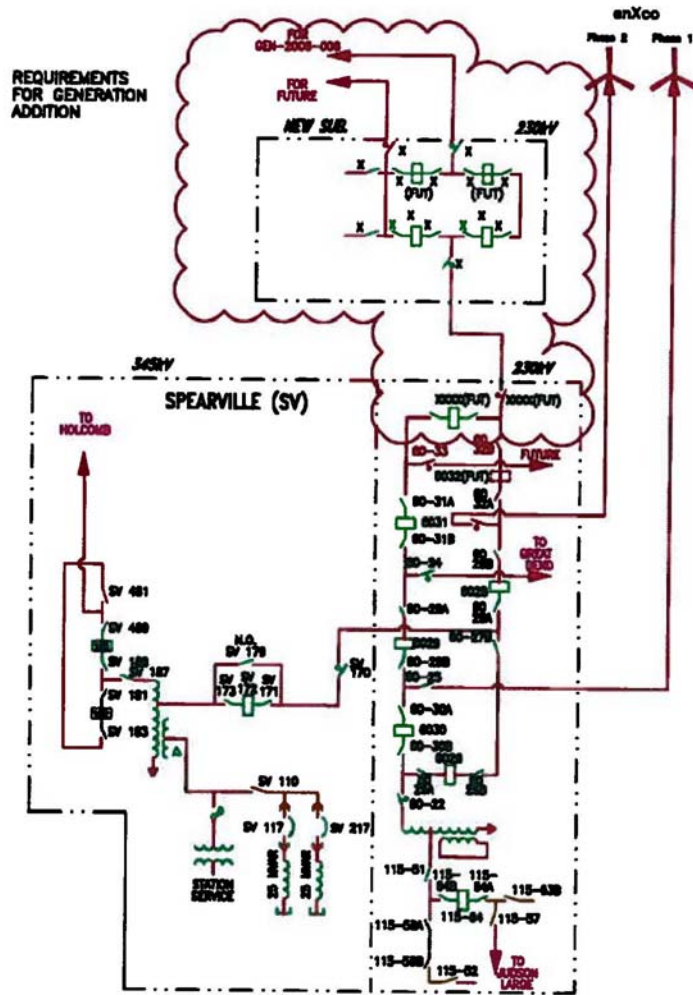


Figure 1. Interconnection Configuration for GEN-2006-006

2.3. **Customer Facilities** – The Customer will be responsible for its Generating Facility and its 230/34.5kV substation that will contain its 230/34.5kV transformer(s) and wind turbine collector feeders. In addition, the Customer will be required to install the following equipment in its facilities.

2.3.1. **Reactive Power Equipment** – Per the Impact Study, the Interconnection Customer may be required to install capacitor banks in addition to the studied General Electric wind turbines to maintain the required 95% lagging/ 95% leading power factor requirement.

3. Conclusion

The Interconnection Customer's non shared network upgrades and interconnection facilities are estimated at \$11,847,000. The Interconnection Customer's shared network upgrades are estimated at \$24,116,276.