



***Facility Study
For
Generation Interconnection
Request
GEN-2010-048***

SPP Tariff Studies

(#GEN-2010-048)

July 2011

Summary

Midwest Energy (MIDW) performed a detailed Facility Study at the request of Southwest Power Pool (SPP) for Generation Interconnection request GEN-2010-048 (70 MW). The proposed in-service date is December 31, 2011. 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.

Interconnection Customer Interconnection Facilities

The Interconnection Customer will be responsible for the 115 kV transmission line from the wind turbine Collector Substation to the Point of Interconnection (POI), a new 115kV substation located in Graham County, Kansas. In addition, the customer will be responsible for reactive power compensation equipment to maintain 95% lagging (providing vars) and 95% leading (absorbing vars) power factor at the point of interconnection.

Transmission Owner Interconnection Facilities and Non-Shared Network Upgrades

Per the following Facility Study, the Interconnection Customer is responsible for **\$2,144,524** of Transmission Owner Interconnection Facilities and non-shared network upgrades.

Shared Network Upgrades

The interconnection customer was studied within the DISIS-2010-002 Impact Study. At this time, the Interconnection Customer is allocated **\$0** 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.

Other Network Upgrades

Certain Network Upgrades that are not the cost responsibility of the Customer are required for Interconnection. These Network Upgrades include:

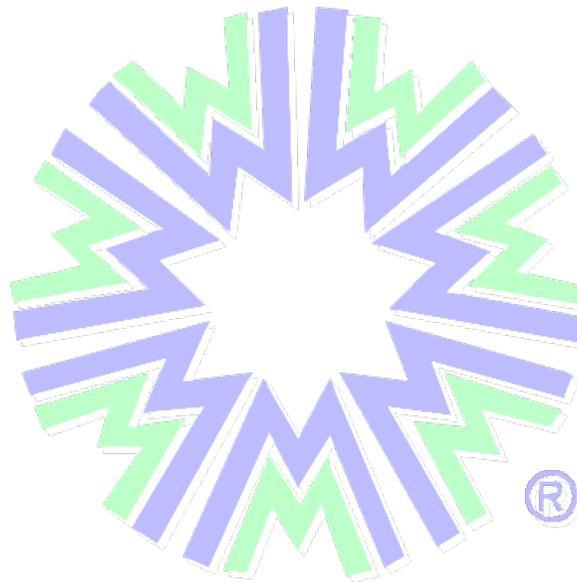
1. Spearville – Post Rock 345kV transmission line
2. Post Rock 345/230/13.8kV Autotransformer
3. Axtell – Post Rock 345kV transmission line
4. Comanche – Medicine Lodge 345kV double circuit transmission line
5. Greenleaf – Knob Hill 115kV CKT 1

These network upgrades are not schedule to be in service until December 31, 2014. Depending upon the status of higher or equally queued customers, the Interconnection Customer's in service date is at risk of being delayed until the in service date of these Network Upgrades.



Midwest Energy Inc.

***Facility Study for Generation Interconnection
Request GEN-2010-048***



June 10, 2011

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Study Overview

At the request of Southwest Power Pool (SPP), Midwest Energy developed the following generation interconnection facility study for interconnection request GEN-2010-048 based on the results of Definitive Interconnection System Impact Study 2010-002 (DISIS-2010-002). As studied in DISIS-2010-002, GEN-2010-048 consists of 70 MW of wind generation interconnecting at a new breaker station on Midwest Energy's Beach-Redline 115 kV line.

The purpose of this study is to identify only facilities and associated costs necessary for interconnection of the proposed wind generation with the 115 kV transmission system. Any network upgrades identified in DISIS-2010-002 are not included in this study. The wind collector system, collector substation, and any transmission line required between the collector substation and point of interconnection are not addressed in this study and are considered the responsibility of the Interconnection Customer.

Interconnection Facilities

A 115 kV breaker station will be constructed approximately 5 miles from the Beach substation in the Beach-Redline 115 kV line to accommodate the generation interconnection. The breaker station will be owned and operated by Midwest Energy, and will be separate from the Interconnection Customer's collector substation facilities. Due to the close proximity of the proposed breaker station to Beach, it will be necessary to replace the line relaying at Beach and one of the existing static wires from Beach to the breaker station with OPGW in order to protect the short line segment properly. Cost estimates for the facilities and equipment required for interconnection, including the Beach relaying and static wire replacement, can be found in Table 1.

Table 1 - Interconnection facility cost estimates

| Facility | Estimated Cost |
|--|-----------------------|
| Interconnection Facilities: 115 kV Line Terminal (Dead end structure, metering, relaying, etc.) | \$725,818 |
| Network Upgrades: 115 kV Breaker Station (Breaker station sitework, breakers, bus, Beach relay replacement and OPGW, etc.) | \$1,418,706 |
| Total | \$2,144,524 |

The information currently available indicates that the Interconnection Customer's Interconnection Facilities might be located in close proximity to the proposed Transmission Owner's Interconnection Facilities at the new substation described above. In this regard, it should be noted that Midwest Energy will not allow the Interconnection Customer's Interconnection Facilities or collector system equipment to be located within the same substation fence as the facilities owned by Midwest Energy, Inc. for security reasons. The Interconnection Customer will remain responsible for all new facilities outside the Point of Interconnection to be established in the new substation, and the cost estimate above is predicated on this requirement.

A fault study was conducted by Midwest Energy to determine if the addition of the proposed generation and contingent system upgrades caused fault levels on the Midwest Energy transmission system to exceed circuit breaker interrupting capabilities. Based on the results of the fault study, it was determined that all fault levels remain within the interrupting capability of existing circuit breakers.

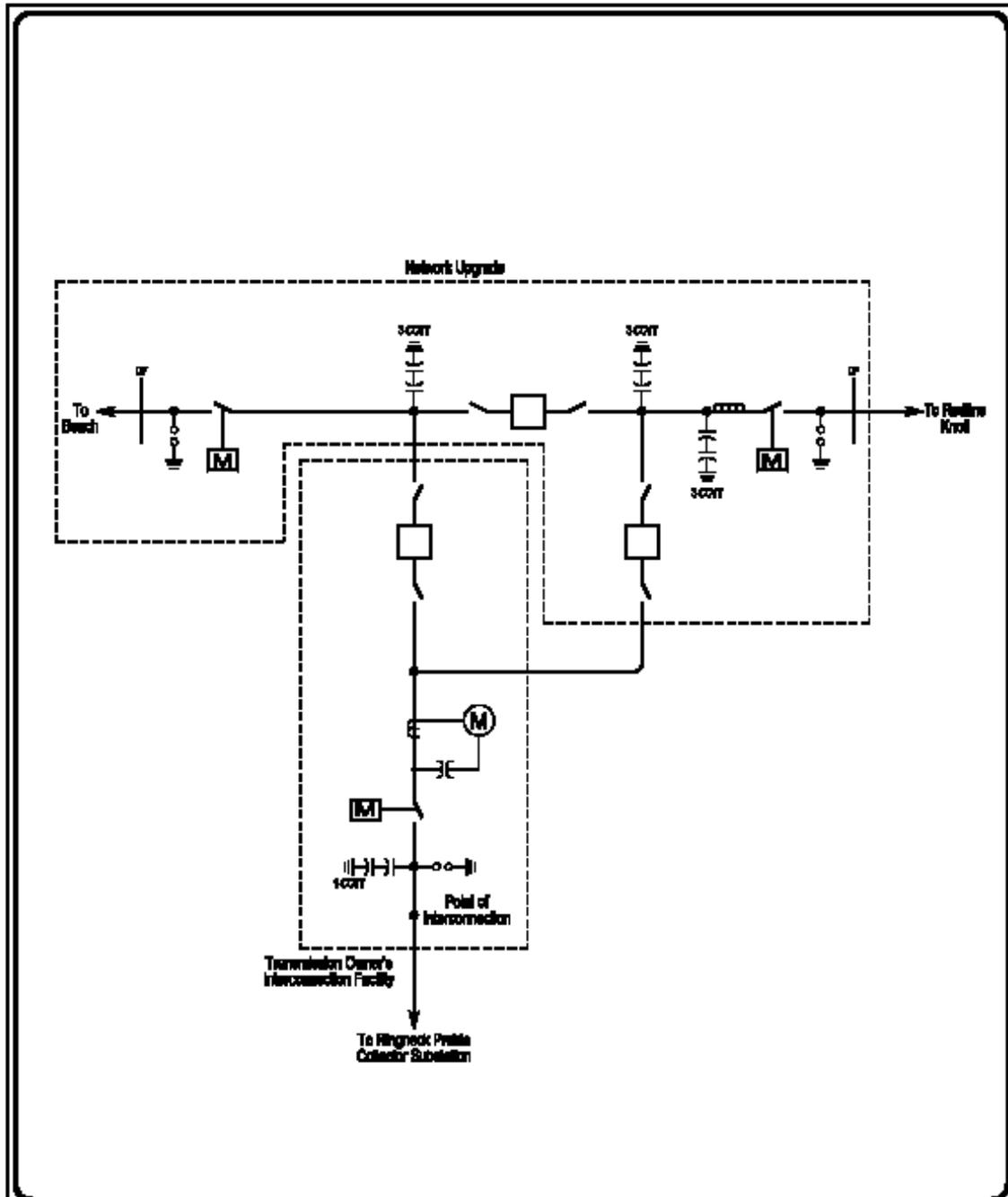
Reactive Compensation Considerations

Power factor requirements for the interconnecting generation were studied and established in DISIS-2010-002, and no additional reactive compensation beyond the capabilities of the Nordex 2.5 MW wind turbines was identified. Midwest Energy reserves the right to request installation of additional reactive compensation by the Interconnection Customer based on operational experience. Of particular concern are light load, low generation production situations resulting in elevated 115 kV bus voltages related to line capacitance of the Interconnection Customer's transmission line and wind generation collector system.

Midwest Energy will require the Interconnection Customer to install either:

- a. Sufficient capacitors, reactors and switching/control equipment to maintain the voltage at the Point of Interconnection at levels not less than 95% of nominal and not greater than 105% of nominal under normal operating conditions; or
- b. A control system for the turbines that is comparable to the GE Wind Farm Management System that provides for real-time control of the reactive power production of the individual turbines and the generating facility as a whole. The control system shall be capable of maintaining the voltage at the Point of Interconnection at levels not less than 95% of nominal and not greater than 105% of nominal under normal operating conditions.

Attachment A
Conceptual One-Line Diagram




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**Ringneck Prairie
Wind Generation
Interconnection**

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|------------|-------|---------|--------------|
| WOB | 1-588 | DATE | DRAWING NO. |
| DESIGN BY: | SJB | 6-10-11 | Ringneck11 |
| CHK BY: | WND | 6-10-11 | SHEET 1 OF 1 |
| PRIC | SJB | | SCALE: NONE |