
# *FCS-2010-001 Shared Facility Study for Transmission Facilities*

## *Post Rock 345/230 kV Transformer #2*

***(ITC and MIDW)***

***SPP Tariff Studies***

***(#FCS-2010-001)***

**March 2011**

**Summary**

ITC Great Plains (ITC) and Midwest Energy Inc. (MIDW) provided Facility Studies at the request of the Southwest Power Pool (SPP) for generation interconnection requests included in DISIS-2010-001 Facilities Clustered Study. The requests for generation interconnection were placed with SPP in accordance with SPP's Open Access Transmission Tariff which covers new generation interconnections on the SPP transmission system.

Pursuant to the tariff, ITC and MIDW were requested to provide Facility Studies for required network upgrades to satisfy the Facility Study Agreement executed by the requesting customer and SPP. The specific network upgrade is the addition of a second 345/230kV transformer at the Post Rock Substation. The Facility Studies are attached as follows:

- Appendix A – Shared Facilities Study of ITC Transmission Facilities for Facility Request FCS-2010-001 (ITC Study)
- Appendix B – Facility Study for Post Rock 345/230kB Transformer #2 (MIDW Study)

**Generation Interconnection Customers**

The generation interconnection requests covered in this document are as follows:

| |
|---|
| GEN-2009-008 |
| GEN-2009-020 |
| GEN-2009-062 |
| GEN-2010-009 |
| GEN-2010-015 |
| GEN-2010-016 |

These interconnection customers are included in the DISIS-2010-001-1 Impact Restudy which identified the required network upgrades for each customer in order to interconnect to the transmission system.

**Shared Interconnection Upgrade Facilities Costs**

The cost to add a second 345/230kV transformer to the Post Rock Substation is $13,749,527. The cost provided by each transmission owner is:

| Transmission Owner | Upgrade Cost |
|---|---|
| ITC | $13,455,500 |
| MIDW | $294,027 |

The Interconnection Customers' total shared upgrade costs are broken down as follows for each project:

| Project | Shared Upgrade Cost |
|---|---|
| GEN-2009-008 | $8,043,937 |
| GEN-2009-020 | $572,783 |
| GEN-2009-062 | $323,801 |
| GEN-2010-009 | $686,955 |
| GEN-2010-015 | $1,073,760 |
| GEN-2010-016 | $3,048,291 |

This cost allocation is subject to change for restudies conducted by the Transmission Provider in response to the higher queued customers or other customers in the DISIS-2010-001-1 Impact Restudy that withdraw their interconnection request or suspend, terminate, or request unexecuted filings of their GIAs.

# Appendix A

# SHARED FACILITIES STUDY of
# ITC TRANSMISSION FACILITIES

# for

# Facility Request FCS-2010-001

## Introduction

The Southwest Power Pool has determined the need for a Facility Study for a number of network upgrades for the purpose of interconnecting certain customers to the ITC Great Plains (ITC) transmission system. The customers and upgrades are identified in the SPP DISIS-2010-001-1 Impact Restudy.

Power flow analysis has indicated that for the power flow cases studied, it is possible to interconnect the transmission line with transmission system reinforcements within the local transmission system.

## Network Upgrades

The primary objective of this study is to identify certain Network Upgrades required for the interconnection of generation customers to the ITC transmission system. The network upgrades shall be constructed and maintained by ITC (unless specified different at a later time). Preferred routes will be determined once the projects have been approved. The required network upgrade facilities and its associated costs are shown in Table 1.

| Table 1: Required Interconnection Network Upgrade Facilities | | | | | |
|---|---|---|---|---|---|
| **PROJECT** | | **ROW Cost** | **Substation Cost** | **Transmission Cost** | **Total Cost** |
| | | | | | |
| Install a second 345/230/xxkV Transformer at Post Rock | Post Rock | | | | $13,455,500 |
| | | | | | |
| **Grand Total** | | | | | $13,455,500 |

## Short Circuit Fault Duty Evaluation

It is standard practice to recommend replacing a circuit breaker when the current through the breaker for a fault exceeds 100% of its interrupting rating with recloser de-rating applied, as determined by the ANSI/IEEE C37.5-1979, C37.010-1979 & C37.04-1979 breaker rating methods.

For this interconnection, no breakers in the ITC area were found to exceed their interrupting capability after the addition of the related facilities.

# Appendix B

Midwest Energy Inc.

# *Facility Study for Post Rock 345/230 kV Transformer #2*

**January 25, 2010**

# Contents

***Study Overview***

At the request of Southwest Power Pool (SPP), Midwest Energy developed the following facility study for the addition of a second 345/230 kV transformer at the Post Rock substation based on the results of Definitive Interconnection System Impact Study 2010-001 (DISIS-2010-001). The second transformer was a required facility upgrade for the generation additions studied in DISIS-2010-001.

The purpose of this study is to identify only facilities and associated costs necessary for the addition of the proposed transformer for the 230 kV side of the Post Rock substation. Facility requirements and associated costs for the 345 kV side of the Post Rock substation, and the cost of the transformer itself, are not the responsibility of Midwest Energy and are not included in this study.

***Interconnection Facilities***

A 230 kV terminal will be added to the Post Rock 230 kV substation to accommodate the transformer. The line terminal includes one 230 kV circuit breaker, substation bus work, metering, relaying, and associated hardware. Cost estimates for the facilities and equipment required for interconnection can be found in Table 1. These costs included only materials required inside the 230 kV substation fence. It is assumed the party responsible for the 345 kV substation additions will supply the transformer secondary lead to the 230 kV substation.

A fault study was conducted by Midwest Energy to determine if addition of the proposed transformer 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.

**Table 1 - Facility cost estimates**

| Facility | Estimated Cost |
|---|---|
| **Upgrades at Post Rock 230 kV Substation:**<br>1-230 kV circuit breaker, switches, relaying, etc. | $294,027 |