



***FCS-2010-001 Shared Facility Study
for
Transmission Facilities in SPS***

***(Hitchland-Border Network Upgrades)
(Wildorado Switch Upgrade)***

***SPP Generation
Interconnection***

(#FCS-2010-001)

April 2011

Summary

Southwestern Public Service Company (SPS) provided upgrade costs at the request of the Southwest Power Pool (SPP) for generation interconnection requests included in FCS-2008-001 Facilities Clustered Study. The requests for 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, Southwestern Public Service Company was asked to provide costs for required network upgrades to satisfy the Facility Study Agreement executed by the requesting customer and SPP.

Generation Interconnection Customers

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

ASGI-2010-011
GEN-2008-047
GEN-2008-088
GEN-2008-110
GEN-2010-007
GEN-2010-014

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

Shared Interconnection Upgrade Facilities Costs

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

Project	Shared Upgrade Cost
ASGI-2010-011	\$5,899,343
GEN-2008-047	\$12,192,448
GEN-2008-088	\$2,073,876
GEN-2008-110	\$26,882,881
GEN-2010-007	\$4,708,699
GEN-2010-014	\$32,169,847
TOTAL	\$83,927,094

The individual customer shared facilities costs are shown in the following tables:

ASGI-2010-011

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$3,146,813
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$636,042
Add 230/115/13.2kV Transformer Ckt2 at Hitchland 230kV substation	\$2,116,488
TOTAL	\$5,899,343

GEN-2008-047

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$8,217,183
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$3,975,265
TOTAL	\$12,192,448

GEN-2008-088

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$1,398,081
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$675,795
TOTAL	\$2,073,876

GEN-2008-110

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$22,907,616
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$3,975,265
TOTAL	\$26,882,881

GEN-2010-007

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$2,844,622
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$980,565
Add 230/115/13.2kV Transformer Ckt2 at Hitchland 230kV substation	\$883,512
TOTAL	\$4,708,699

GEN-2010-014

Upgrade Type	Allocated Costs
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. Includes substation work at Hitchland and Border	\$27,412,780
Add -50/+100MVAR SVC at Hitchland 230kV substation	\$4,757,067
TOTAL	\$32,169,847

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 Impact Study that withdraw their interconnection request or suspend, terminate, or request unexecuted filings of their LGIAs.

**SHARED FACILITIES STUDY of
SPS 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 Southwestern Public Service Company (SPS) transmission system. The customers and upgrades are identified in the SPP DISIS-2010-001 Impact Study.

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 SPS transmission system. The network upgrades shall be constructed and maintained by SPS (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.

Hitchland 230kV Static Var Compensator –

During the Facility Study process, SPP has determined the approximate required sizes for the necessary fixed shunt reactors that will need to be installed on the Hitchland-Border double circuit 345kV transmission line. These fixed shunt reactors have been sized at 35Mvars each. There will be a total of four (4) 35 Mvar reactors (one on each end of the double circuit 345kV transmission line).

In testing the stability impacts of adding the 345kV fixed shunt reactors, it was observed that a potential voltage collapse situation may occur for the outage of the Finney – Stevens County

345kV transmission line and without the previously assigned Wheeler – Anadarko 345kV transmission line (assigned in the DISIS-2010-001 Impact Study and removed in the DISIS-2010-001-1 Impact Restudy). The solution for mitigating the voltage collapse is for the installation of a -50/+100 Mvar Static Var Compensator to be installed on the 230kV bus at Hitchland Substation.

The final sizing of the 345kV fixed shunt reactors and the SVC will be completed once all Interconnection Customers have authorized the procurement and construction of these long lead time items.

Table 1: Required Interconnection Network Upgrade Facilities

PROJECT		ROW Cost	Substation Cost	Transmission Cost	Total Cost
Build 53 miles of double circuit 345 kV transmission line from Hitchland to mid-point of TUCO to Woodward 345 kV line. (This represents 50% of the estimated distance – remainder estimated by OG&E)	Hitchland		\$3,733,790		
	Mid-point	\$3,331,306		\$58,861,999	\$65,927,095
Add -50/+100MVAR SVC at Hitchland 230kV substation	Hitchland			\$15,000,000	\$15,000,000
Add 230/115/13.2kV Transformer Ckt2 at Hitchland 230kV substation	Hitchland				\$3,000,000
Grand Total					\$83,927,095

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 SPS area were found to exceed their interrupting capability after the addition of the related facilities.