



***FCS-2008-001 Shared Facility Study  
for  
Transmission Facilities***

***Gray County Interchange-Stevens County Interchange  
345 kV Transmission Line***

***SPP Tariff Studies***

***(#FCS-2008-001)***

***March 2010***

## Summary

Several Facility Studies were completed for certain Generation Interconnection requests included in the 1st cluster facility study (FCS-2008-001). The requests for interconnection were placed with SPP in accordance with SPP's Open Access Transmission Tariff, which covers new generation interconnections on SPP's transmission system. The transmission owners conducting the studies are Sunflower Electric Power Company (SUNC or Sunflower) and Southwestern Public Service Company (SPS).

Pursuant to the tariff, the transmission owners were requested to perform Facility Studies of the generation interconnection requests to satisfy the Facility Study Agreement executed by the requesting customers and SPP. The Facility Studies are attached as follows:

- Appendix A – 345 kV Transmission Line from Gray County Interchange to Stevens County Interchange (SUNC)
- Appendix B – 345 kV Transmission Line from Gray County Interchange to Stevens County Interchange (SPS)

## Shared Interconnection Upgrade Facilities Costs

The FCS-2008-001 Interconnection Customers are included in the 1<sup>st</sup> Cluster Study approved in FERC Docket #ER09-262. The cost to construct a 345 kV transmission line from the Gray County Interchange to the Stevens County Interchange is \$70,907,260 and is broken down by the following transmission owners:

SUNC:	\$40,352,000
SPS:	\$30,555,260

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

GEN-2007-005:	\$14,164,760
GEN-2007-008:	\$11,160,840
GEN-2007-045:	\$5,699,099
GEN-2007-046:	\$15,777,236
GEN-2007-048:	\$21,703,853
GEN-2007-057:	\$2,401,471

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 1<sup>st</sup> Cluster that withdraw their interconnection request or suspend, terminate, or request unexecuted filings of their LGIAs.

## **APPENDIX A**

# **FACILITY STUDY**

**for**

## **Facility Request FCS-2008-001**

**345kV Transmission Line  
From Gray County Interchange to Stevens County Interchange  
(SUNC)**

## **Introduction**

The Southwest Power Pool has determined the need for a Facility Study for a new 345kV transmission lines for the purpose of interconnecting a Generation Interconnection Cluster Study Customers. The 345kV transmission line will be located within the service territory of Sunflower Electric in Gray, Haskell, Seward, and Stevens County, Kansas. The proposed 345kV point of interconnection is at a new 345kV station on the Spearville – Holcomb 345kV line in Gray County. This substation is owned by Sunflower. There will be a second point of interconnection at the proposed Steven County Interchange on the Hitchland-Finney 345kV line owned by Southwestern Public Service (SPS).

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 Upgrade. The requirements for interconnection consist of adding a new 345kV three breaker ring bus on the Spearville – Holcomb 345kV line in Gray County, Kansas and building the 345kV transmission line from the Gray County substation to the interconnect point with SPS at a point to be determined. This 345kV addition shall be constructed and maintained by Sunflower (unless specified different at a later time). A preferred route will be determined once the project has been approved.

The total cost for Sunflower to build a new 345kV station at Gray County is estimated at \$8,202,000. This cost does not include building 345kV line.

The costs of interconnecting the facility to the Sunflower transmission system are listed in Table 1.

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

**Table 1: Required Interconnection Network Upgrade Facilities**

Facility	ESTIMATED COST (2010 DOLLARS)
SUNC – Gray County – Build a 345kV 3 breaker ring bus at Comanche County	<b>\$8,202,000</b>
SUNC – Transmission line, bundled 1590ACSR, 3000A, steel shield wire. Half the distance from Gray County – Steven County at 35 miles.	<b>\$31,500,000</b>
SUNC – Right of Way for above lines	<b>\$650,000</b>
<b>Total</b>	<b>\$40,352,000</b>

## **APPENDIX B**



**FACILITY STUDY**

**for**

**Facility Request FCS-2008-001**

**345kV Transmission Line  
From Gray County Interchange to Stevens County Interchange  
(SPS)**

## **Introduction**

The Southwest Power Pool has determined the need for a Facility Study for a new 345kV transmission lines for the purpose of interconnecting a Generation Interconnection Cluster Study Customers. The 345kV transmission line will be located within the service territory of Sunflower Electric in Gray, Haskell, Seward, and Stevens County, Kansas. The proposed 345kV point of interconnection is at a new 345kV station on the Spearville – Holcomb 345kV line in Gray County. This substation is owned by Sunflower. There will be a second point of interconnection at the proposed Steven County Interchange on the Hitchland-Finney 345kV line owned by Southwestern Public Service (SPS).

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 Upgrade. The requirements for interconnection consist of adding a new 345kV transmission line terminal to the Stevens County (Kansas) 345kV interchange and building the 345kV transmission line from the Stevens County interchange to the interconnect point with Sunflower at a point to be determined. This 345kV addition shall be constructed and maintained by SPS (unless specified different at a later time). A preferred route will be determined once the project has been approved.

The total cost for SPS to build a new 345kV line terminal at Stevens County is estimated at \$2,258,321. This cost does not include building 345kV line.

The costs of interconnecting the facility to the SPS transmission system are listed in Table 1.

### **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, SPS has not identified any circuit breakers that were found to exceed their interrupting capability after the addition of the related facilities.

**Table 1: Required Interconnection Network Upgrade Facilities**

Facility	ESTIMATED COST (2010 DOLLARS)
SPS – Stevens County – Add 345kV breaker for line extension to Sunflower	<b>\$2,258,321</b>
SPS – Transmission line, bundled 795ACSR, 2000A, steel shield wire. Half the distance from Steven County – Gray County at 35 miles.	<b>\$24,350,040</b>
SPS – Right of Way for above lines	<b>\$3,946,899</b>
<b>Total</b>	<b>\$30,555,260</b>