



***Facility Study for Generation
Interconnection Request
GEN – 2006 – 035***

***SPP Tariff Studies
(#GEN-2006-035)***

November 2007

Summary

American Electric Power Southwest Transmission Planning (AEP) performed the following study at the request of the Southwest Power Pool (SPP) for SPP Generation Interconnection request Gen-2006-035. The request for interconnection was placed with SPP in accordance with SPP's Open Access Transmission Tariff Attachment V, which covers new generation interconnections on SPP's transmission system.

Pursuant to the tariff, AEP 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.

Affected System Facilities

Southwestern Public Service (d/b/a Xcel Energy) (SPS) was asked to perform short circuit analysis on its transmission system to determine if any transmission facilities were affected by the addition of GEN-2006-035. No SPS facilities were deemed to be affected by the addition of GEN-2006-035.

Western Farmers Electric Cooperative (WFEC) was asked to perform short circuit analysis on its transmission system to determine if any transmission facilities were affected by the addition of GEN-2006-035. No WFEC facilities were deemed to be affected by the addition of GEN-2006-035.

***Generation Interconnection
Facilities Study***

For

GEN-2006-035

***American Electric Power
Southwest Transmission Planning***

November 2007

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Introduction

The Southwest Power Pool (SPP) has requested a Facility Study for interconnecting a 225 MW wind farm power plant in Beckham County, Oklahoma. The proposed in-service date is December 2008.

The purpose of this study is to identify the facilities and their costs that are needed to interconnect the new generation with AEP's 230 kV transmission system. This facilities study is done in conjunction with SPP Feasibility and Impact Studies for Generation Interconnection Request GEN-2006-035

The interconnection point for the new generation will be a new 230 kV substation built on AEP's portion of the Elk City to Grapevine (SPS) 230 kV tie line. AEP will build a new 3 breaker ring bus 230 kV substation to accommodate the new interconnection. The new AEP station will include a Control House with available room for all metering, protection and SCADA systems needed for the interconnection. If both this request and GEN-2006-002 interconnect into the substation, a fourth ring bus terminal will be required.

A detailed description of all costs associated with the construction of this interconnection is shown in Tables 1 and 2.

Interconnection Facilities (See Figures 1 and 2)

The customer requested interconnection to a point on the Elk City – Grapevine 230 kV transmission line at a point in northwest Beckham County, Oklahoma. This point is also the point of interconnection for a prior queued request in the SPP queue. Request GEN-2006-002 also requested interconnection into a new substation in northwest Beckham County, Oklahoma on the Elk City – Grapevine 230 kV transmission line.

To meet the requirements for interconnection of the 225 MW wind farm, AEP will build a new 3 breaker ring bus 230 kV substation in the existing Elk City – Grapevine 230 kV transmission line, which is jointly owned by AEP and SPS. The new AEP station will include a Control House with available room for all metering, protection and SCADA systems needed for the interconnection. If both this request and GEN-2006-002 interconnect into the substation, a fourth ring bus terminal will be required.

230 kV Substation

A new 230 kV ring bus substation will be built on the Elk City to Grapevine (SPS) tie line for the generation interconnection. This substation will consist of three 230 kV circuit breakers and associated equipment. If both this request and GEN-2006-002 interconnect into the substation, a fourth ring bus terminal will be required. A 230 kV line will be required to connect the generators to the 230 kV bus. See Figure 1 for details.

The design and construction of the new substation will meet all AEP specifications for stations. Bus work and disconnect switches will be designed to accommodate the loading requirements, and circuit breakers will be rated to ensure adequate load and fault interrupting capability. Metering equipment will be installed to monitor the plant output and will meet the required accuracy specifications. The interconnect metering now located at Elk City will be moved to the new substation for the Grapevine line. AEP will own, operate and maintain the substation.

Short Circuit Fault Duty Evaluation

AEP conducted a short circuit fault duty evaluation for impacts that could be contributed to the new generator. Due to Southwestern Public Service Company (SPS) & Western Farmers Electric Cooperative (WFEC) having transmission facilities in close proximity to the new 230 kV substation, SPS and WFEC also conducted a short circuit fault duty evaluation for the request.

It is standard practice for AEP 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.

In the AEP system, no breakers were found to exceed their interrupting capability after the addition of the 225 MW of wind farm generation and related facilities.

SPS found no breakers that needed replacing, due to the new generation, on the SPS system.

WFEC found no breakers that needed replacing, due to the new generation, on the WFEC system.

Therefore there is no short circuit upgrade costs associated with the Gen-2006-002 interconnection.

Interconnection Costs

Listed below are the costs associated with interconnecting the 225 MW wind farm generation facility to the AEP transmission system.

Table 1: Required Interconnection Facilities

(Assuming prior queued project withdraws)

SYSTEM IMPROVEMENT	COST (2004 DOLLARS)
New 3 breaker 230 kV ring bus substation. Including all metering, protection, and SCADA	\$5,148,000
Replace line panel and carrier equipment at Elk City 230 kV substation	\$350,000
TRANSMISSION INTERCONNECTION FACILITY TOTAL COSTS	\$5,498,000

Table 2: Required Interconnection Facilities

(Assuming prior queued project stays in the queue)

SYSTEM IMPROVEMENT	COST (2004 DOLLARS)
Add 230 kV terminal to the ring bus station built for request GEN-2006-002	\$1,203,000
TRANSMISSION INTERCONNECTION FACILITY TOTAL COSTS	\$1,203,000

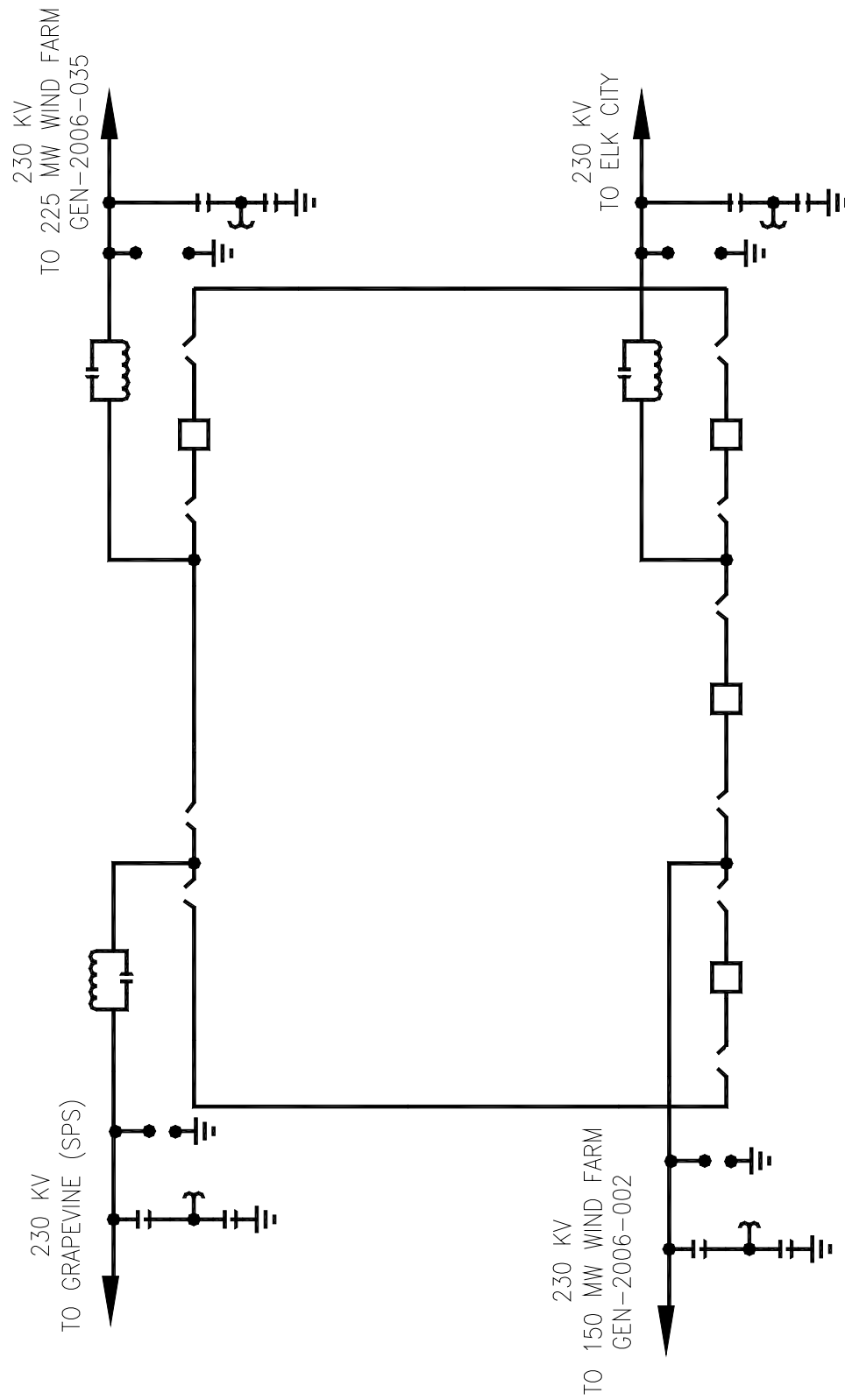


FIGURE 1
NEW 230 KV SUBSTATION FOR INTERCONNECTION

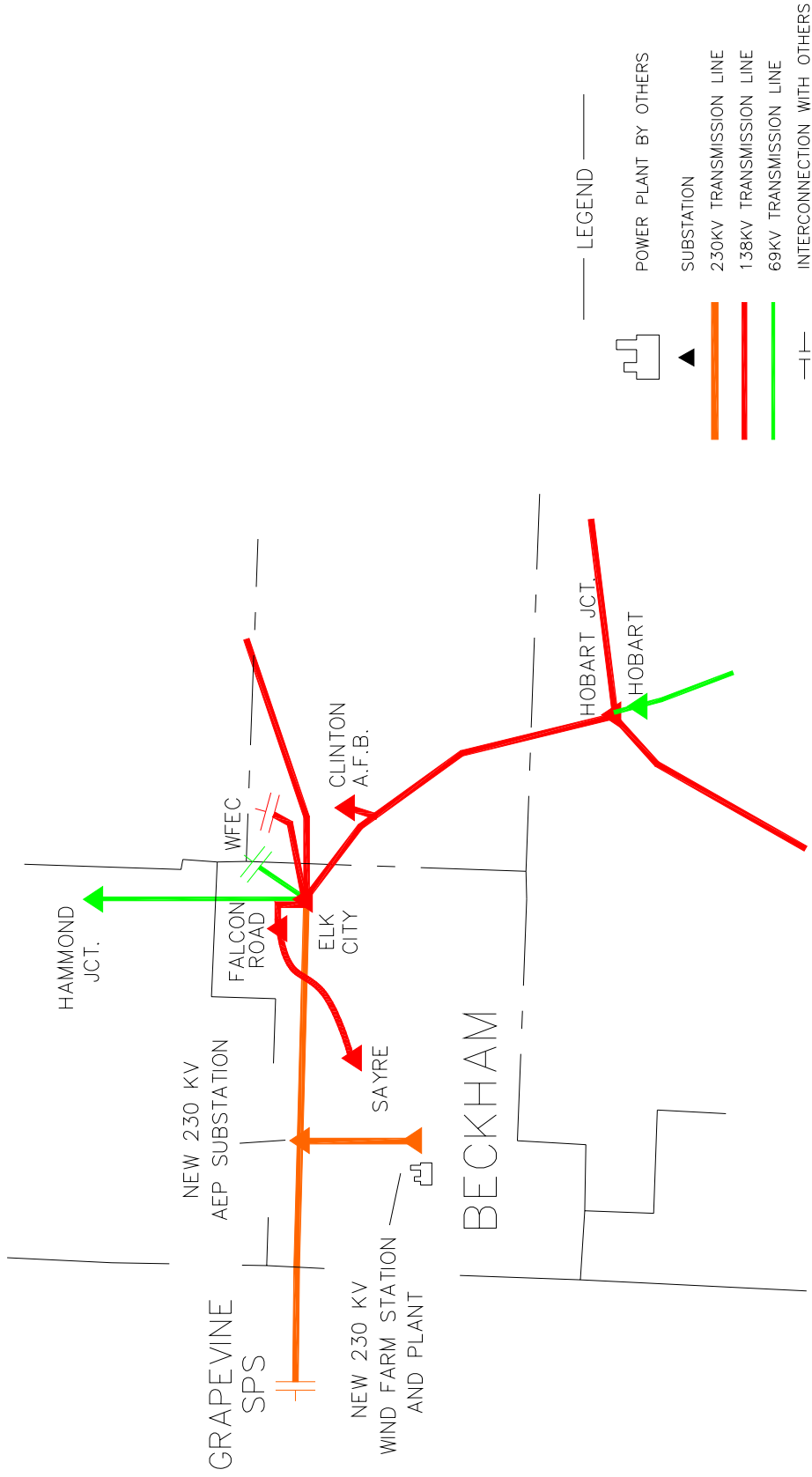


FIGURE 2 ELK CITY AREA TRANSMISSION MAP