Southwest Power Pool

Facility Study for Generation Interconnection Request GEN – 2006 – 002

SPP Tariff Studies
(#GEN-2006-002)

September 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-2006-002. 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 facilities were affected by the addition of GEN-2006-002. No SPS facilities were deemed to be affected by the addition of GEN-2006-002.

Western Farmers Electric Cooperative (WFEC) was asked to perform short circuit analysis on its transmission system to determine if any facilities were affected by the addition of GEN-2006-002. No WFEC facilities were deemed to be affected by the addition of GEN-2006-002.

Generation Interconnection Facilities Study

For

GEN-2006-002

American Electric Power
Southwest Transmission Planning

July 2007

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Introduction

The Southwest Power Pool (SPP) has requested a Facility Study for interconnecting a 150 MW wind farm power plant in Beckham County, Oklahoma. The proposed in-service date is March 2009.

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-2006-002.

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.

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

Interconnection Facilities (See Figures 1 and 2)

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. 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. 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) having transmission facilities in close proximity to the new 230 kV substation, SPS 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 150MW of wind farm generation and related facilities.

SPS found no breakers that needed replacing, due to the new generation, on the SPS 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 150 MW wind farm generation facility to the AEP transmission system.

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**

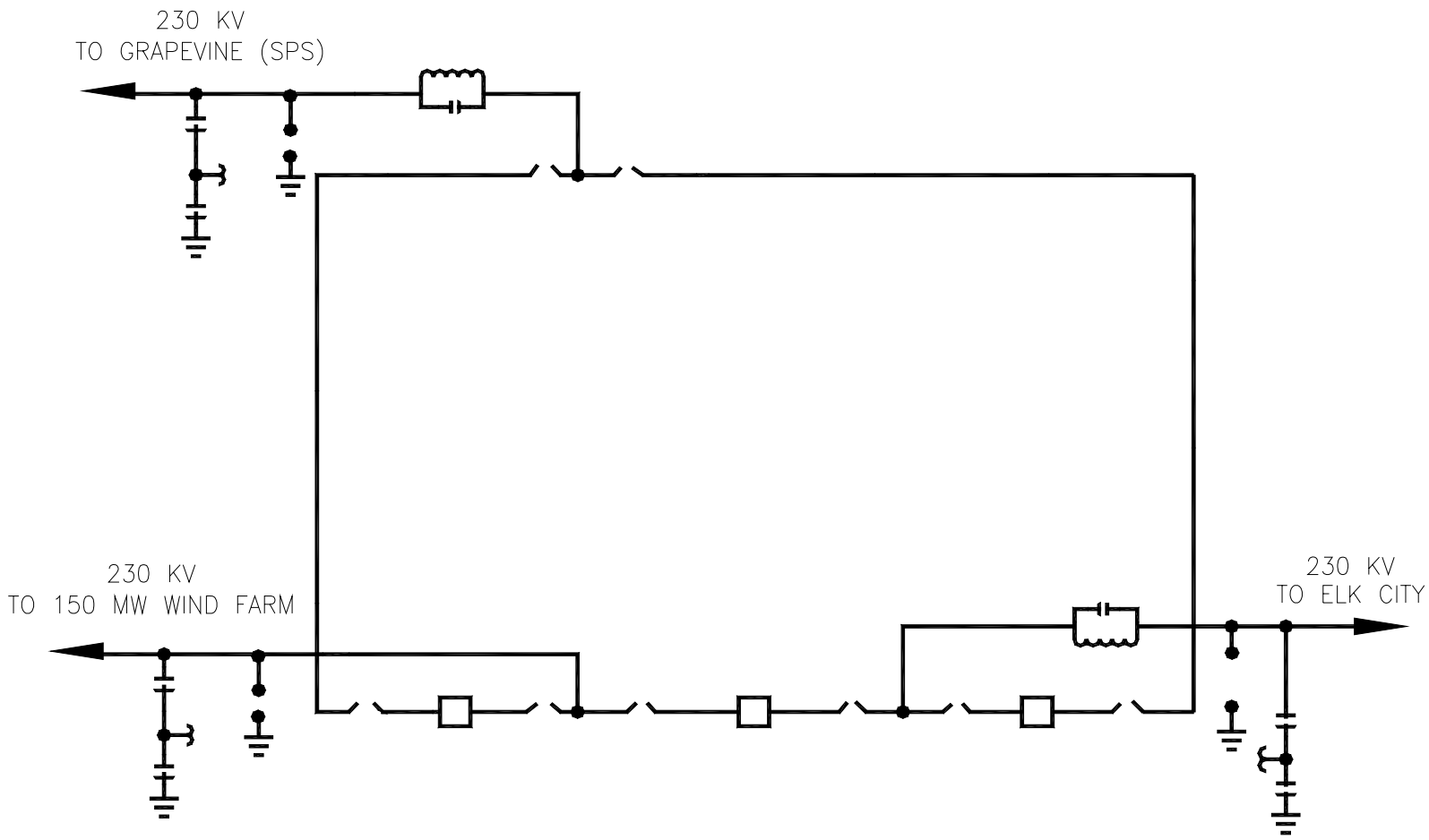

FIGURE 1
NEW 230 KV SUBSTATION FOR INTERCONNECTION

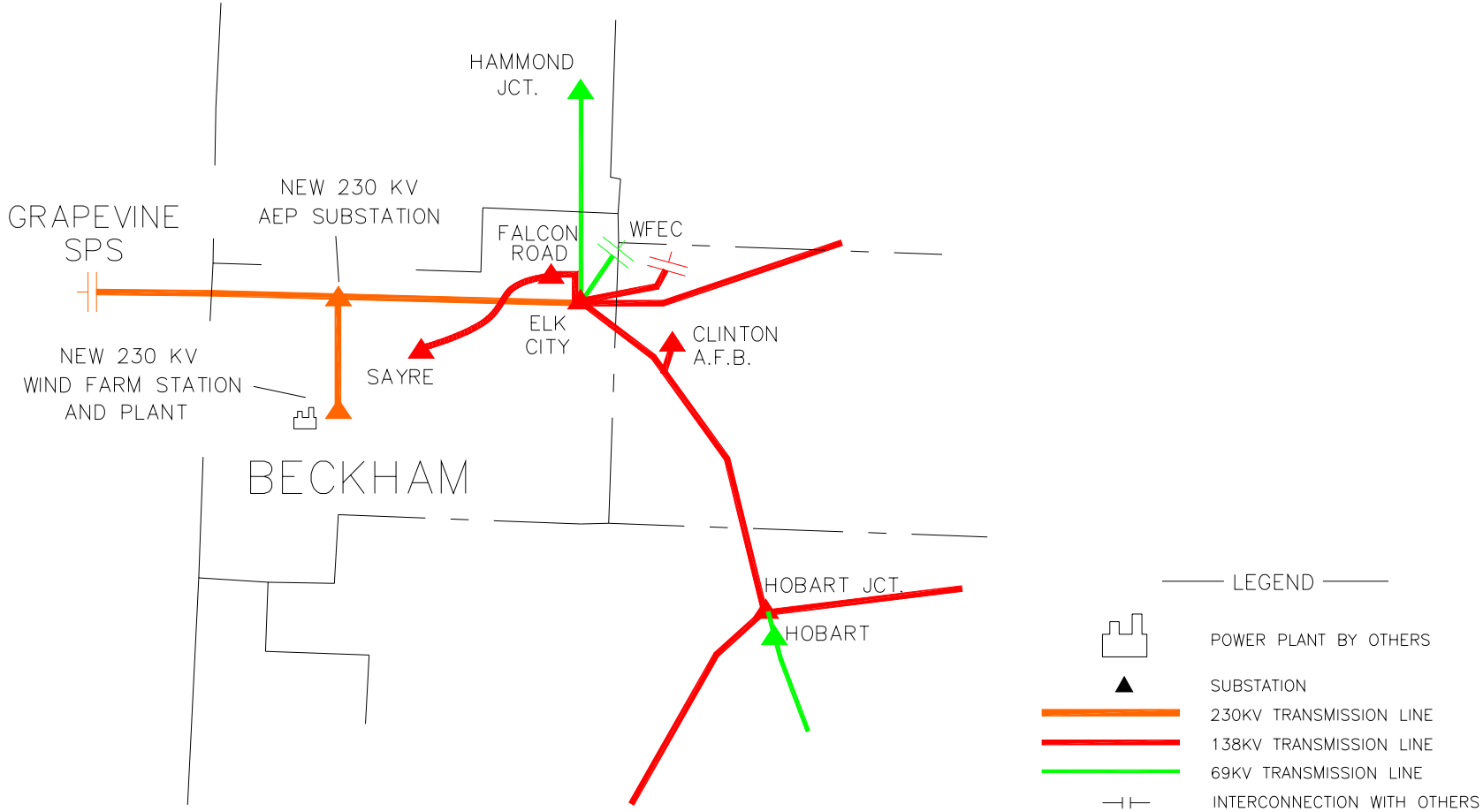

FIGURE 2 ELK CITY AREA TRANSMISSION MAP