



**SPP**

*Southwest  
Power Pool*

***Facility Study  
For  
Generation Interconnection  
Request  
GEN-2006-027  
GEN-2006-028***

***SPP Tariff Studies***

***(#GEN-2006-027)  
(#GEN-2006-028)***

***May, 2007***

## **Summary**

Pursuant to the tariff and at the request of the Southwest Power Pool (SPP), Westar Energy performed the following Facility Study to satisfy the Facility Study Agreement executed by the requesting Customer and SPP for SPP Generation Interconnection Request #GEN-2006-027 and #GEN-2006-028.



**Generation Interconnection Facilities  
Study**

**For**

**Generation Interconnection Request  
SPP-GEN-2006-027  
SPP-GEN-2006-028**

**May, 2007**

## **Introduction**

This report summarizes the results of a Generation Interconnection Facilities Study performed for the Southwest Power Pool (SPP) by Westar Energy, Inc. (WR) to evaluate two generation interconnection requests by [Omitted Text] (Customer) for a 310 / 380 MW (summer / winter rating) (GEN-2006-027) and for a 300 / 360 MW (summer/winter rating) (GEN-2006-028) of gas-fired generation in Lyon County, Kansas, to the transmission system of Westar Energy, Inc. The proposed interconnection is at the WR transmission system at the existing Lang 345 kV substation on the Swissvale – Wichita 345 kV transmission line. Prior to this were completed both a Feasibility Study and a System Impact Study. The requested in-service date of the generating facility is May 1, 2008 for GEN-2006-027 and May 1, 2009 for GEN-2006-028. It is not possible for Westar Energy, Inc. to engineer, procure, and construct the required facilities by the requested in-service date under the Standard Option of the Standardized Large Generator Interconnection Agreement.

## **Project Location and Existing Facilities**

The project is located near Emporia, Kansas, in Lyon County approximately at the existing Lang 345 kV Substation on the Swissvale – Wichita 345 kV transmission line. The Lang Substation occupies property adjacent to the proposed development. The interconnection will be effected at a new 345 kV breaker and a half substation adjacent to the existing Lang Substation. The substation will connect to WR facilities at 345 kV. Figure 1 shows the Westar Energy regional transmission facilities and Figure 2 shows the Westar Energy transmission facilities in the local area as well as the service areas of other utilities at the point of interconnection. The proposed project is not within the Westar Energy service area.

## **Short Circuit Analysis**

Westar performed a short circuit analysis to determine if any circuit breaker or other interrupting equipment would have its interrupting capacity exceeded by the addition of GEN-2006-027 and GEN-2006-028. Westar evaluated both the 345 kV and 115 kV transmission facilities in the vicinity of the GEN-2006-027 and GEN-2006-028 generating facility. Using the information provided with the application, there does not appear to be any transmission equipment that is overdutied as a result of connecting the proposed generating facilities.

## **Interconnection Facilities**

Interconnection to the WR transmission system will be by way of a new 345 kV breaker and a half switching station. For this phase of the generation project, the substation will be built to accommodate both phases of the Interconnection Customer's project. The existing Swissvale – Lang 345 kV transmission line will be tapped in and out of the new interconnection substation. The existing Morris – Lang 345 kV transmission line will be tapped in and out of the new interconnection substation. The existing Lang – Wichita 345 kV transmission line will be tapped out of the new interconnection substation. The new interconnection substation will have 345 kV line terminals for Lang, Morris, Swissvale, and Wichita substations. The existing Lang 345 kV substation will operate radially from the new interconnection substation.

### **345 kV Substation**

The estimated cost is for the substation required for both interconnection requests GEN-2006-027 and GEN-2006-028 at the same location. These two interconnection requests are by the same Customer. The substation is a 345 kV five-bay breaker and a half scheme. The substation will consist of: fourteen (14) 345 kV breakers; thirty-two (32) 345 kV disconnect switches; fourteen (14) 345 kV CCVTs; five (5) 345 kV wave traps; eight (8) 345 kV, new redundant primary relaying; relaying setting changes and trap tuning at Lang, Morris, Swissvale, and Wichita; four (4) 345 kV full tension deadend structures; and all associated site, yard and conduit work. This estimate includes all equipment inside the substation fence up to the Point of Change of Ownership. Figure 3 shows the substation layout.

**\$26,000,000**

### **345 kV Interconnection Metering**

The estimated cost is for interconnection metering at the connection point of the five generator step-up transformers to the new 345 kV substation. Each of the three interconnection metering installations will consist of three (3) 345 kV VTs, three (3) 345 kV CTs, and revenue interconnection metering plus all associated site, yard and conduit work.

**\$ 1,350,000**

### **345 kV Transmission Line Work**

The estimated cost includes steel turning structures to connect the existing Lang – Swissvale 345 kV transmission line into the interconnection substation plus associated foundations and labor. The existing transmission line is equipped with optical shield wire for communications. The estimated cost includes steel turning structures to connect the existing Lang – Morris 345 kV transmission line into the interconnection substation plus associated foundations and labor. The estimated cost includes steel turning structures to connect the existing Lang – Wichita 345 kV transmission line into the interconnection substation plus associated foundations and labor. The existing transmission line is equipped with optical shield wire for communications.

**\$ 3,000,000**

The total cost estimate for Transmission Owner Interconnection Facilities (Interconnection Metering) and Stand Alone Network Upgrades (345 kV Substation and Transmission Line Work) is:

**\$26,000,000 345 kV Ring-bus Substation**  
**\$ 1,350,000 345 kV Interconnection Metering**  
**\$ 3,000,000 345 kV Transmission Line Work**  
**\$30,350,000**

This estimate is accurate to +/- twenty (20) percent, based on current prices, in accordance with Attachment A of Appendix 4 of the Interconnection Facilities Study Agreement. However,

recent cost escalations in materials are very significant and the accuracy of this estimate at the time of actual construction cannot be assured.

Westar Energy also maintains its own Facility Connection Requirements, which may be found at ([westarenergy.com](http://westarenergy.com)).

Figure 1 – Westar Energy Regional Transmission

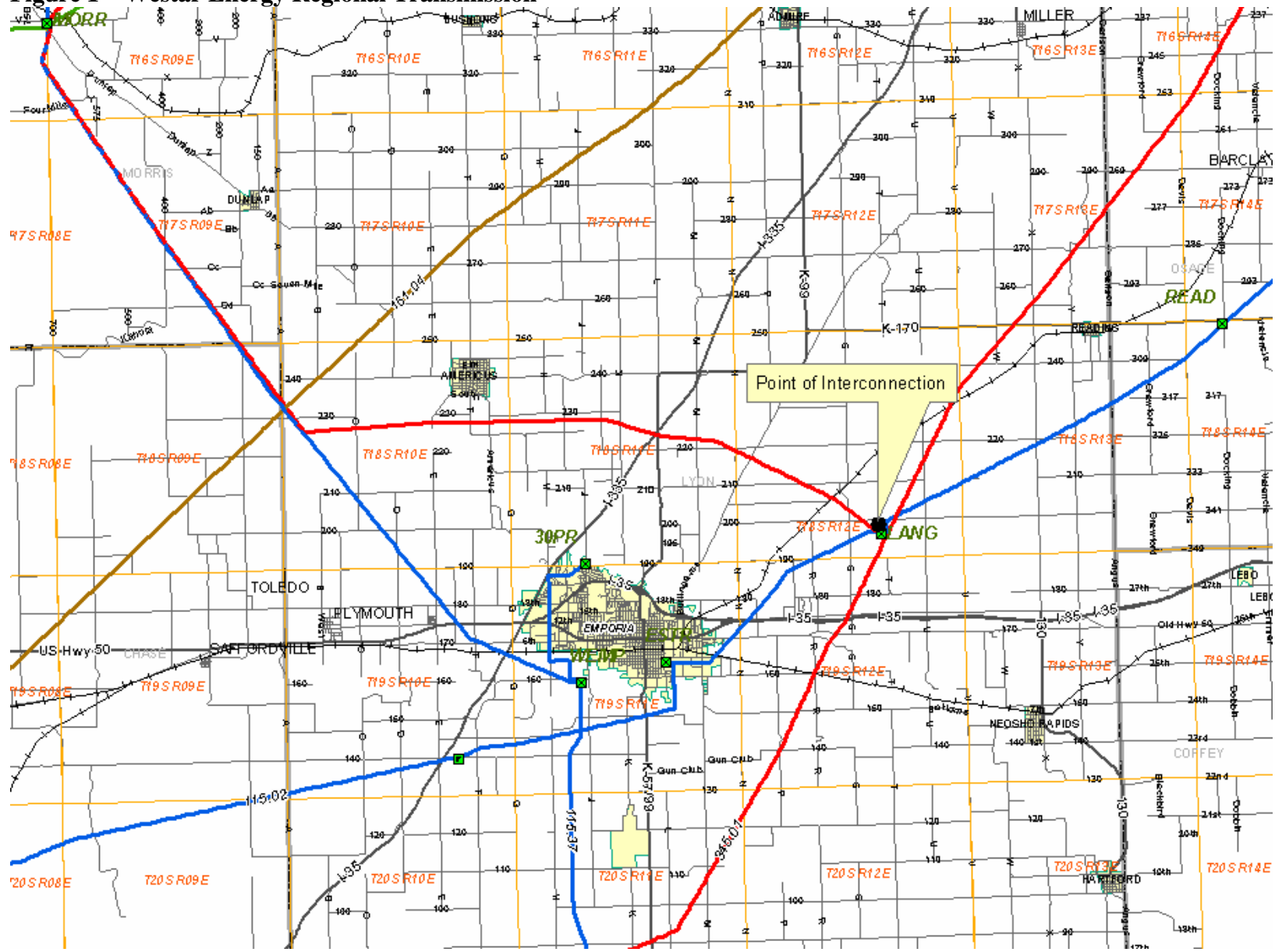
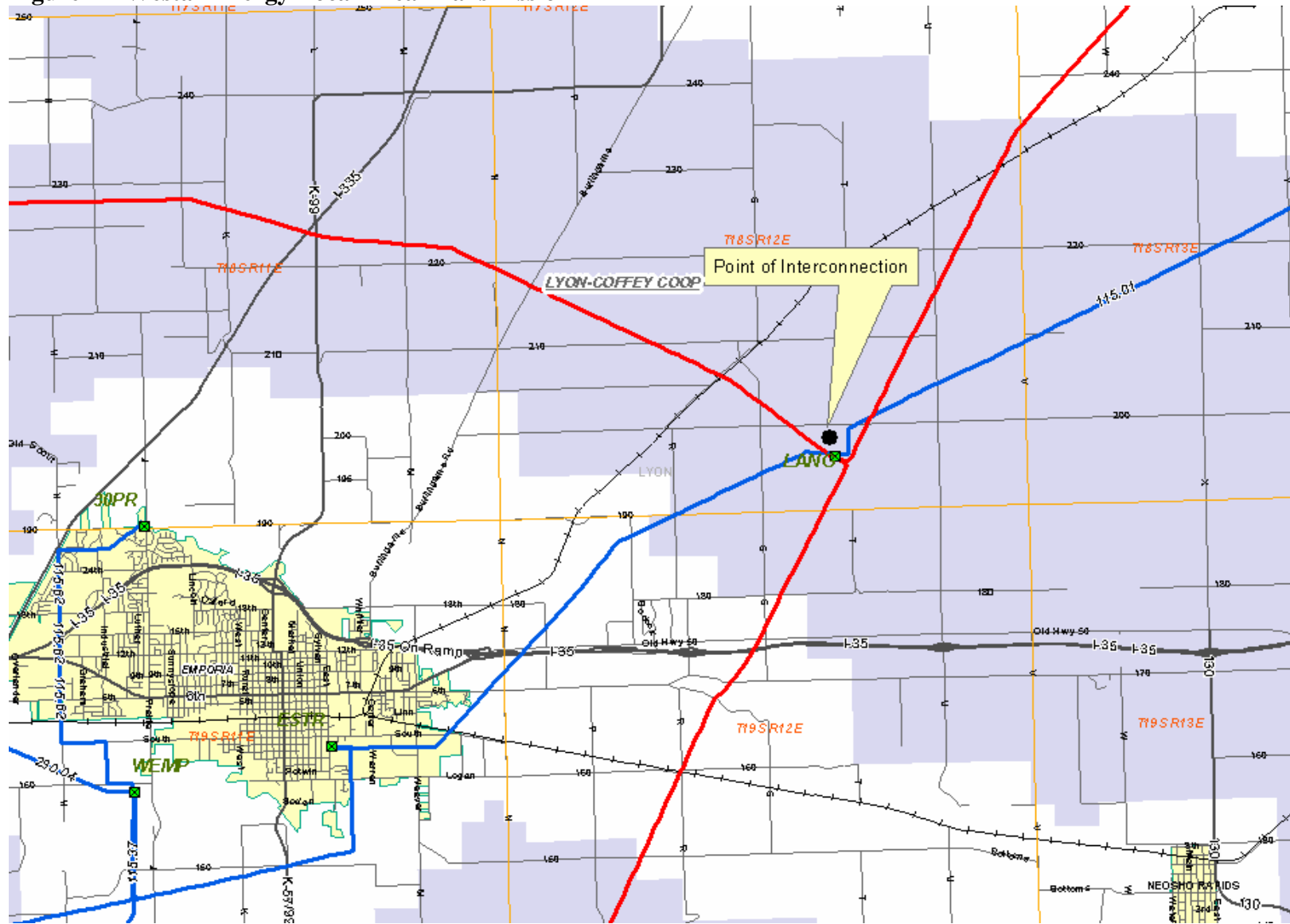


Figure 2 – Westar Energy Local Area Transmission



The shaded areas show the other utility service areas with their names



**Figure 3 – Interconnection Substation Layout**

