



## **Study Review SPS-009**

July 17, 2006

Xcel Energy Services, Inc.  
Transmission Planning

## Executive Summary

SPS Merchant requested that Transmission Planning review specific studies done by an outside consultant evaluating the integration of 250-500 MW of new generation in the Southwestern Public Service System. This review addresses specific questions raised by SPS Merchant about the Study SPS-009. At the time of this report, no studies have been conducted by Southwest Power Pool as part of the Generation Interconnection process under the SPP OATT. Any opinions or results presented are preliminary and should be considered as such.

Study SPS-009 evaluates the addition of approximately 520 MW (summer rating) of new generation to be located near Hobbs, New Mexico. The project may be completed all at once or may be staged with 300 MW of CTs coming on by summer 2008 and the steam unit by summer 2009.

The questions to be addressed as part of this review and the preliminary answers are:

- Are the interconnection facilities appropriate?
  - Yes, for the system studied they are reasonable.
- Is a “breaker and a half” scheme for interconnection appropriate for interconnecting generating facilities of the magnitude identified in the study?
  - Yes. The facility will consist of three generators. Due to the location of the plant, the risk of loss due to a bus fault should be minimized and the use of a “breaker and a half” scheme would do this.
- Is the point of interconnection to the SPS transmission system appropriate? If not, please explain.
  - Based on the time to review, it is appropriate, but it will have future implications.
- Are the network upgrades appropriate? Are any of the identified upgrades currently being planned and budgeted?
  - The recommended system upgrades in the consultant’s report are listed below along with a short discussion. They have been regrouped to be addressed by potential alternative solutions.
    1. Nichols-Harrington 230 kV line upgrading (rebuild/reconductor)
    2. Nichols 230/115 kV auto upgrades

These are primarily related to the change in generation pattern at Nichols Plant (lowering of 115 kV generation to accept the output of the new facility). The auto upgrades are part of the recommended 5 year transmission capital budget. The upgrading of the Nichols – Harrington lines will also involve upgrading terminal equipment to higher ratings. Altering the Nichols Plant dispatch may mitigate these needs somewhat and additional studies will be required to determine impact.

3. Lea County 230/115 kV transformer – add 2<sup>nd</sup> transformer
4. Cunningham Plant 230/115 kV transformer – add 2<sup>nd</sup> transformer
5. Yoakum Intg.230/115 kV transformer – add 2<sup>nd</sup> transformer

Upgrade 3 and 4 are due to the addition of the 520 MW of generation on the 230 kV system in southeastern New Mexico and the resultant overloads of the existing nearby 230/115 kV autotransformers. Upgrade 5 is due to the same reason, but may have been needed due to reliability issues in that area.

There are proposed projects that are part of the recommended 5-year transmission capital budget and are expected to rectify the need for item 4 and 5. Item 3, the Lea County addition, may not be possible due to limited space for expansion to Lea County Intg. - the site is hemmed-in by gas pipelines. Additional work will need to be done to define what expansion is possible at this site.

6. Moore Co 230/115 kV auto – install 2<sup>nd</sup> auto

This upgrade is related to generation re-dispatch issues to accommodate the output of the new plant. A project to replace the existing auto with a larger transformer has been submitted for inclusion in the 5-year transmission capital budget.

7. Doud – SP-Yuma 115 kV line upgrade

Additional studies will need to be done to confirm the cause of this overload. It may be related to a change in the Lubbock generation pattern to accommodate the new plant output.

8. Dalhart 28.8 MVAR capacitor bank
9. Boardman 7.2 MVAR capacitor bank
10. Hereford 28.8 MVAR capacitor bank

These capacitor banks are recommended to remedy low voltage conditions under contingencies. Item 8 and 10 are not considered acceptable due to the already heavy use of capacitor banks in the area. Both will require new transmission construction to provide a reasonable solution. Studies are continuing on future transmission additions for both areas. The Boardman capacitor bank is probably a reasonable solution for the voltage problem, given the year it is needed (2016).

A cursory review of the costs of these projects was made and in total, the costs are reasonably close, some are high, some are low, but in general they are reasonable. Overall, it's a reasonable set of upgrades given the generation assumptions and modeling of the new plant.

One additional transmission line is noted on page 12 of the consultant's report. Assumed in the studies to be completed is the Seven Rivers – Pecos – Potash 230 kV line. This is a planned 230 kV line to reinforce the southeastern New Mexico transmission system. It was a proposed line to be built depending on the

rate at which new load was being added in the southeastern New Mexico area, specifically Seven Rivers and Carlsbad areas. This load has not developed and this project is not a current project. No work has been done in preparation for a Certificate of Convenience and Necessity (CCN) permit which would be required. This proposed line is approximately 30 miles long and will require a CCN from the New Mexico Public Regulation Commission. Additional studies are required to determine the impact of this line not being in-service.

- Are any of the network upgrades identified as needed by summer 2008 or 2009 as indicated in the studies, eligible to be delayed to subsequent years?
  - No. Refer to previous response.
- Are there operating procedures and/or special protection schemes that can be utilized in 2008 as transmission improvements are in-progress?
  - Partially. SPP is supportive of an operating procedure as a temporary tool while material delivery or construction is underway. SPP is not supportive to using operating procedures as replacements for the necessary construction to maintain reliability. These operating procedures will have to be developed once the final interconnection plan has been studied by SPP and a construction schedule has been developed. No specific operating procedures were evaluated as part of this study review.
- Are the price estimates reasonable (without performing a full engineering cost estimate)?
  - Yes and No. Network Upgrade costs look reasonable – interconnection costs look high. The table below shows the cost estimates for the interconnection facilities. Steel pole 230 kV structures were chosen due to availability as compared to wood poles.

**Interconnection Substation and Facilities**

<b>Standalone Network Upgrade</b>	<b>Cost</b>
4 terminal, 6 bkr 230 kV bkr and 1/2 station	\$3,262,328

<b>Network Upgrades</b>	
Revision of line relaying Midland - Lea Co	\$180,448

<b>Other Facilities</b>	
Additional 230 kV breaker at Cunningham Plt.	\$948,493
~8.5 miles 230 kV steel pole line to Cunn. Plt	\$4,585,489
<b>Total Other Facilities</b>	<b>\$5,533,982</b>

**Total Project**

**\$8,976,758**

*Costs - 2006 dollars, No AFUDC, 30% estimates*

The estimated total in the report was \$13.7 million.

- Are the timeframes for installation (e. g. 18 months lead time for a 230/115 kV transformer) reasonable?
  - Equipment time frames are reasonable, but project timeline is marginal for 2008, more realistic for 2009.

Current delivery on 230/115 kV autotransformers is 15 months. Considering time to develop bid specifications and administrative tasks, 18 months delivery is a reasonable assumption. All areas of electrical equipment are having longer delivery times. Current delivery times (from date of order):

230/115 kV autotransformers	15 months
230 kV breakers	4 months
115 kV breakers	5 months
230 kV wood poles	6 months
115 kV wood poles	6 months
230/115 kV steel poles	4 months

These time frames continue to change and are generally getting longer.

- When would SPS need to begin the design/engineering and procurement processes for upgrades in order to meet a June 1, 2008 in-service date for the generator?
  - Design/engineering work would have to start immediately. More important is the permitting work and it also would have to start immediately. Based on SPP study timelines, potential Certificate of Convenience and Necessity requirements, material order time and construction schedule, it appears that a June 2008 isd will be very challenging. A more realistic isd is the fall of 2008, at best.

No detailed powerflow studies were done to verify the consultant's work. However, from our discussions with the consultant, we are comfortable he has used reasonable judgment in his work.