SPS Planning Criteria and Study Methodology

SPS subscribes to the Southwest Power Pool ("SPP") Reliability Criteria, which incorporates compliance with the appropriate North American Electric Reliability Corporation ("NERC") Planning Standards, which are enforced by the Regional entity ("RE") function of SPP.

SPS's own specific criteria are applied in the development of the power flow data and conducting the studies. These should be considered in coordination with Attachment R-SPS to the Xcel Energy Operating Companies Joint OATT. Brief descriptions of those criteria follow.

Voltage Criteria

SPS allows a range of 0.95 per unit (p.u.) to 1.05 p.u. for the system voltage at a specific bus, for base cases under normal flow conditions. SPS does not limit the maximum allowable voltage change during a contingency (voltage deviation criteria). The maximum allowable voltage change is dependent on the makeup of the customer load in the area of the contingency and the starting point for the voltage before the contingency. The +/- 0.05 p.u. base case voltage range is applied to all voltages, including sub-transmission networks.

During contingency studies SPS allows a range of 0.90 per unit (p.u.) to 1.05 per unit (p.u.) for the system voltage for most buses. The contingency range is dependent on the type of load at the bus under examination, the transmission equipment rating and any regulating equipment, which can be used to regulate the voltage delivered to the customer. Voltage deviations up to 1.10 per unit voltage may be permitted depending on the specific equipment ratings.

When evaluating available transfer capability, the TUCO 230 kV bus voltage is monitored and not allowed to go below 0.92 p.u. to minimize the risk of voltage collapse and system separation from the SPP. This requirement will be removed after Summer 2008 when the TUCO Static Var Controller is placed in service.

Transmission Element Rating Criteria

SPS has rated its transmission elements in accordance with the Xcel Energy Transmission Facility Rating Methodology, Version 3.0, dated April 19, 2007. The document requires the use of the most limiting element for each transmission branch and considers all elements of the transmission branch. Normal and emergency ratings are developed for both summer and winter periods and used in the powerflow models.

Transformer Tap Ratios

Transformers with both fixed high side taps and low side tap changers are modeled to reflect the setting of the high side taps. The actual load tap changer adjustment range of the specific transformer is provided in the power flow data.

North-South Flow Criteria

SPS has three 230 kV north-south transmission lines and two 115 kV north-south transmission lines. The 230 kV lines are the Amarillo South Interchange-Swisher County Interchange line, the Bushland Interchange-Deaf Smith Interchange-Plant X line, and the Potter County Interchange-Plant X line. The 115 kV lines are the Randall County Interchange-Palo Duro-Happy Interchange line and Osage Switching Station-Canyon-Hereford Interchange line. The stability limit is 800 MW flow south on these lines for an outage of a Tolk unit.

Interconnected Reliability Criteria

These criteria provide a framework for analyzing SPS's system in transfer analysis with other companies to which SPS is connected. A brief discussion of SPS's tie-lines is necessary for some understanding of the network.

SPS has both synchronous and asynchronous tie-lines in service. The connection with American Electric Power Company's ("AEP") Public Service of Oklahoma ("PSO") operating company from SPS's Grapevine Interchange to PSO's Elk City Interchange is a 230 kV transmission line. The second connection with PSO is a 345 kV line from SPS's TUCO Interchange to PSO's Interchange near Oklaunion, Texas, which has a High Voltage Direct Current ("HVDC") tie to ERCOT. A lesser interconnection is with AEP's West Texas Utilities ("WTU") operating company is through 115 kV lines originating out of SPS's Kirby switching station and connecting to WTU's Jericho115/69 kV interchange and 115 kV bus at Shamrock, Texas. The 69 kV tie may be operated closed or open based on operating requirements on WTU's transmission system. There is also a 69 kV interconnection between WTU's Shamrock 69 kV bus and SPS's Magic City 69 kV bus that is normally open. SPS has a 115 kV interconnection with Mid-Kansas Electric Company's substation at Liberal, Kansas. It is connected to SPS's Texas County Interchange near Guymon, Oklahoma through a 115 kV phase shifting transformer. An additional interconnection from Potter County Interchange to Finney Switching Station to the Holcomb Plant 345 kV line was placed in service in 2001. Sunflower Electric Power Corporation owns the Holcomb Plant.

SPS also has three interconnections with utilities in the Western Electricity Coordinating Council ("WECC"). The first is the Blackwater HVDC Interconnection near Clovis, New Mexico. This HVDC is owned and operated by Public Service Company of New Mexico ("PNM"). This HVDC interconnection is rated 200 MW nominal. The second HVDC interconnection is the Eddy County HVDC Interconnection near Artesia, New Mexico. This HVDC interconnection is

owned by El Paso Electric and PNM and operated and maintained by SPS under contract. The rating of this interconnection is 200 MW nominal. The third is the Lamar HVDC Interconnection near Lamar, Colorado with Public Service Company of Colorado (PSCo). This HVDC is owned by PSCo and is jointly operated by SPS and PSCo. This HVDC interconnection is rated 210 MW nominal. The HVDC interconnections do not have response characteristics of synchronous inter-ties and remain block loaded during contingency studies.

SPS's AC or synchronous interconnections have historically been built for system reliability. However, due to increases in load, these interconnections are presently required to meet demand during peak loading conditions. Additionally, these interconnections provide for emergency power if one of SPS's generators is suddenly taken off line. The largest SPS generators are the Tolk Plant units, both of which are rated 540 MW net. The existing synchronous interconnections are designed to allow the SPS system to sustain the loss of a Tolk unit without separating from the SPP.

The evaluation of power flows in or out of SPS's system should be based on SPS's reliability criteria to maintain synchronous connection with the SPP at all times. It is SPS's interconnected reliability criteria that any proposed transmission service will not reduce the ability of SPS to remain connected with the SPP in all contingencies under study. Thus, if any import of power is scheduled into the SPS system, this scheduled import cannot be so large that the loss of this import forces SPS to separate from the SPP. Similarly, the evaluation of an export of power from the SPS system should meet the same criteria. With the export or import of power occurring, there should not be cascading loss of interconnections with the SPP due to the single outage of a transmission or generation element.

General Assessment Practices

On an annual basis, SPS prepares power flow model data based on the previous year's annual peak and the current load forecast. Historical actual load point data is used in preparing the new power flow base cases.

SPS performs single contingency outage studies on the summer peak models by examining the loss of each transmission element. The transmission elements are defined to be all transmission lines between 345 kV and 115 kV and transformers with high side connections to these transmission voltage levels. Each single contingency outage case is reviewed to determine if system improvement is required to provide reliable service during this contingency. Single contingency studies may be performed on the winter peak and average load models, to determine the sensitivity of the network to outages with seasonal generation patterns. Studies on the 69 kV sub-transmission network are targeted

every two years. SPS's 69 kV network is extensive and is for a large part operated radial. Studies on selected portions of the 69 kV network may be done on a much more frequent basis, depending on load growth in a specific area.

If a network addition is proposed in a specific region of the transmission system, single contingency studies will be made of that area with the proposed addition to determine its ability to provide service. The studies will be made in the model year that the transmission addition is proposed to go into service and also for the model year that is the furthest into the future. For example, if a new 230/115 kV interchange is to go into service in 2009, the addition of this interchange would be studied in 2009 power flow models, and would also be studied in the future models to determine the long-term performance of this network addition.

For SPS's study purposes, power flow simulations are done with area interchange control enabled with tie-lines and load, transformers with load tap changers regulating, and generator voltage regulation enabled. All SPS generators are assumed to be capable of regulating voltage between their minimum and maximum reactive power limits. Small non-utility generators, and wind farms do not provide significant voltage regulation. The HVDC interconnections are block loaded in power flow simulations. Studies can be done with a full Newton solution or a decoupled Newton solution.

Where new generation is needed but not yet known as to its exact location, fictitious generators will be placed on the system as needed to maintain a balance between load and generation. These are normally placed at the Tolk Plant bus first, and if needed the Jones Plant bus. These are internal busses in the powerflow model.

Interconnected Reliability Assessment Practices

It is important that any proposed transfer of power or construction of facilities not degrade SPS's interconnected reliability. SPS does perform contingency studies on the loss of a Tolk unit, the largest generating unit in the control area, with all HVDC tie-lines in service as a baseline case.