AMERICAN ELECTRIC POWER

TRANSMISSION PLANNING RELIABILITY CRITERIA

PSO, SWEPCO and AEP Oklahoma Transco, Inc. are all members of the SPP, and as a condition of membership have agreed to conform to all approved and applicable SPP and North American Electric Reliability Corporation (NERC) reliability Standards (NERC Standards) for the Bulk Electric Systems of North America. The SPP Criteria have been supplied to the Office of Energy Emergency Operations, Department of Energy under EIA-411. The SPP Criteria will be made available by the SPP to the public per the procedures stated below.

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Process for public access to SPP Criteria:

Information will be provided by SPP after receipt of a written request pursuant to the above contact information and pre-paid fee, as designated by SPP, or may be downloaded from the SPP website at: http://spp.org

Attached is a document entitled "The American Electric Power System Transmission Planning Criteria". This document provides the criteria to test and assess the strength of AEP's transmission system to meet its load serving responsibility and provides a description of transmission planning criteria for the AEP System.

Purpose

This report presents an overview of AEP's transmission planning criteria.

The AEP criteria described herein supplements the: 1) North American Electric Reliability Corporation (NERC) Reliability Standards; 2) SPP Criteria with Appendices Section 3, Regional Transmission Planning Criteria where applicable.

Nominal Voltage Levels

Nominal 765 kV, 345 kV, 161 kV, and 138 kV voltage levels will normally be used for most new power transmission lines and are considered Bulk Electric System (BES). Some interconnection lines may be at 500 kV, 230 kV, or 115 kV to match neighboring utilities' voltage, and some Sub Transmission 69 kV lines may be constructed in appropriate situations.

Voltage Limits

Transmission level buses shall meet the following steady state voltage response and post-contingency voltage deviation criteria:

- 0.95 per unit to 1.05 per unit in the pre-contingency state following the occurrence of any operating condition in category P0 of the NERC Reliability Standard TPL-001-4 addressing Transmission System Planning Performance Requirements.
- 0.92 per unit to 1.05 per unit in the post-contingency state following the occurrence of any operating condition in categories P1 through P7 of the NERC Reliability Standard TPL-001-4 addressing Transmission System Planning Performance Requirements.
- Following the occurrence of any operating condition in categories P1 through P7 of the NERC Reliability Standard TPL-001-4, further analysis to assess voltage stability is required in the event of a post-contingency steady-state voltage deviation that exceeds 8% at any load-serving bus above 100 kV, exclusive of buses on a radial system that serve only Resource Entities and/or Load.

Transmission voltages during emergencies should not result in customer voltages exceeding or falling below prescribed limits at distribution substations on the transmission system and voltages at generating stations below minimum acceptable levels established for each station must be avoided to prevent tripping of the generating units. Static and dynamic reactive devices and LTC auto-transformers are used in transmission substations to hold voltage levels within acceptable ranges during normal and emergency conditions. The low limit can be lower if voltage regulating equipment maintains voltage to the customers within prescribed limits at distribution substations involved without causing voltage problems at nearby loads. Voltage fluctuations (flicker) are addressed in the AEP Interconnection Guidelines.

Thermal Limits

Thermal ratings define transmission facility loading limits. Normal ratings are generally based upon no abnormal loss of facility life or equipment damage. Emergency ratings accept some loss of life or strength, over a defined time limit for operation at the rated loading level. The thermal rating for a transmission line is defined by the most limiting element, be it a conductor capability, sag clearance, or terminal equipment rating. Thermal limits establish the maximum amount of electrical current that a transmission circuit or electrical facility can conduct over a specified time period before it sustains permanent damage by overheating or before it violates public safety requirements. Normal and emergency transmission equipment ratings are documented by AEP standards and guidelines.

Transmission level buses shall meet the following performance criteria:

- No facility may exceed its normal rating in the pre-contingency state following the occurrence of any operating condition in category P0 of the NERC Reliability Standard TPL-001-4 addressing Transmission System Planning Performance Requirements.
- No facility may exceed its emergency rating in the post-contingency state following the occurrence of any operating condition in categories P1 through P7 of the NERC Reliability Standard TPL-001-4 addressing Transmission System Planning Performance Requirements.

Steady State Testing Criteria

Steady State testing of the AEP transmission system is in accordance with NERC Reliability Standard TPL-001-4.

Short Circuit Testing Criteria

AEP steady state planning criteria requires that no bus voltage on AEP system shall exceed 1.05 per unit under system normal or contingency conditions. This voltage limit takes into consideration the equipment capabilities on AEP system. Short circuit assessment is performed assuming 1.05 per unit voltage at all the AEP system buses.

Stability Testing and Performance Criteria

Stability testing of the AEP transmission system is in accordance with NERC TPL-001-4 In addition, the SPP Disturbance Performance Requirements document for the SPP area.