

SOUTH CAROLINA PUBLIC SERVICE AUTHORITY
CORPORATE
RELIABILITY CRITERIA
AND
SYSTEM PLANNING
GUIDELINES

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SOUTH CAROLINA PUBLIC SERVICE AUTHORITY
CORPORATE
RELIABILITY CRITERIA

The South Carolina Public Service Authority (Santee Cooper) endeavors to maintain a degree of reliability in electric service that will satisfy the average customer's requirements at a reasonable cost. As a member of SERC Reliability Corporation (SERC), Santee Cooper adheres to regional reliability standards and also to the Reliability Standards developed by North American Electric Reliability Corporation (NERC). In order to meet these objectives, Generation and Transmission Reliability Criteria have been developed for the Santee Cooper System.

GENERATION

Santee Cooper is required to install resource capacity and capability (that is reasonable and appropriate for its own situation) sufficient to adequately carry its own load without undue burden to the surrounding systems. Santee Cooper generally targets planning reserve margins of 10-13 percent above the projected annual peak hour load to satisfy this requirement.

TRANSMISSION

Santee Cooper plans the transmission system to (1) operate during normal and single contingency conditions and (2) maintain system voltages which are consistent with good utility practice. The transmission system is planned to provide voltage at the delivery point connection to a customer, during normal and single contingency conditions, which will satisfy guidelines recommended by applicable ANSI and NEMA standards on electrical equipment power requirements, when the customer's electrical equipment is connected through appropriate customer-owned facilities. No transmission facilities may operate outside their continuous ratings during normal conditions or outside their emergency ratings during single contingency conditions.

GUIDELINES FOR IMPLEMENTING RELIABILITY CRITERIA
Revised September, 2007

Santee Cooper has developed guidelines for implementing the Corporate Generation and Transmission Reliability Criteria. The following Guidelines are to be used by Santee Cooper planning engineers in testing existing and proposed future facilities throughout the system for compliance with minimum acceptable reliability as defined by the Criteria. These Guidelines will be revised periodically as appropriate. The current revision is September 2007.

NERC Reliability Standards and SERC Regional Standards

In addition to the Corporate Generation and Transmission Reliability Criteria, the Santee Cooper transmission system is planned to meet the requirements of all approved NERC Reliability and SERC Regional Standards that are applicable to Santee Cooper. These Standards can be found at www.nerc.com and www.serc1.org

Generation

As outlined in the Corporate Reliability Criteria, Santee Cooper plans additional capacity when the projected Reserve Margin falls below 10-13 percent. The Reserve Margin is defined as the difference between the rated system generating capability and the projected peak load divided by the projected peak load. At the present time, purchases from SEPA are accounted for as a reduction in load instead of a Capacity Resource. Beginning at the time Central acquires a Capacity Resource other than the purchase of capacity and energy from SEPA, the SEPA purchases will be accounted for as a Capacity Resource. This treatment of SEPA purchases is required by the Coordination and Integration Agreement with Central.

Transmission

The primary concerns on the transmission system are that (1) all facilities remain within their continuous ratings as outlined in Santee Cooper's Transmission Facility Ratings Methodology Document during normal operating conditions, (2) all facilities remain within their emergency ratings during single contingency conditions, (3) the voltage on the transmission system remains within the ratings of the facilities on the system, and (4) the voltage at the delivery point connection to each customer is within the operating range of standard equipment for the voltage class of the delivery point connection. The Guidelines for testing the transmission system are categorized by Loading and Voltage.

1. Facility Loadings

During normal system operation, no transmission substation transformer shall operate above its maximum 55 degree Celsius rating.

During normal system operation, no distribution substation transformer shall operate above its maximum 65 degree Celsius rating.

During normal system operation, no transmission line shall operate above its maximum continuous rating.

During emergency conditions (single contingency), no transmission substation transformer shall operate above 107 percent of its maximum 65 degree Celsius rating.

During emergency conditions, no distribution substation transformer shall operate above 116 percent of its maximum 65 degree Celsius rating.

During emergency conditions, no transmission line shall operate above its emergency rating.

2. Bus Voltages

All delivery point bus voltages are recommended to remain between 92.5 and 102.5 percent of nominal during normal operating conditions and between 90 and 104 percent of nominal during emergency operating conditions for peak and off-peak loads. However, if the delivery point bus voltage is within the recommended bandwidth during emergency operating conditions but outside the recommended bandwidth during normal operating conditions, an additional study will be conducted of the delivery point facilities to determine if reinforcement is necessary.

Capacitor banks shall be sized such that switching a bank on or off will not result in a simulated voltage change greater than five percent on the bus to which the capacitor bank is connected.

3. Other Policies and Practices for Transmission Planning

Each new generation site shall have a minimum of two transmission lines constructed with the first unit installed (preferably three lines). Either of the lines shall be able to carry the full output of the plant with all other facilities operating within their continuous ratings. As additional units are installed at the site, additional transmission lines should be added such that any one-third of the transmission lines may be out of service at any time without detriment to the remaining system.

Under normal operating conditions, the transmission system shall be capable of supplying the annual peak hour load using all possible generation dispatch combinations equal to the system load with all facilities operating within their continuous ratings.

The system shall be capable of withstanding the loss of all generation and transmission at one voltage level located at any one generating plant switchyard during the peak hour with no facilities operating above their emergency ratings.

The system shall be capable of withstanding the loss of the two largest generating units located at any one generating plant during the peak hour with no facilities operating above their emergency ratings.

The desired minimum Import Capability for the Santee Cooper system should be equal to or greater than the sum total of firm transmission service reservations, the transmission reliability margin and the capacity benefit margin.

Loss of all transmission lines on a common right-of-way should not result in the remaining facilities operating above their emergency ratings.

There shall be at least one system spare for every size and type of transformer on the system.

For large transmission transformers which cannot be moved easily and cannot be taken out-of-service without unacceptable loss of system reliability, a spare transformer will be installed in parallel.

For distribution substation transformers, the number of system spare transformers to be maintained is one plus five percent of the number of energized transformers of that capacity and voltage class.

Typically, transformers installed in new 230 kV and 115 kV substations will be equipped with Load Tap Changers (LTC). Where justified by reliability or economic considerations, existing 230 kV transformers without LTC are to be replaced with LTC

transformers or regulation added to the substation.

In the absence of other considerations, when the load on a radial transmission line at a distance greater than ten miles from the transmission station exceeds that listed below, an alternative line should be considered.

<u>Voltage Class</u>	<u>Load</u>
230 kV	70 MW
115 kV	60 MW
69 kV and below	50 MW