

Southern Company Transmission
Southern Companies' Power System Stabilizer Policy
July 23, 2014

Background

A Power System Stabilizer (PSS) is an electronic feedback control that is a part of the excitation system control for generating units. The PSS acts to modulate the generator field voltage to dampen power system oscillations. Under certain system conditions and contingencies, PSS control is needed to improve damping performance on the Southern Company transmission system and to mitigate the potential for power system oscillations. Transmission Planning has observed in stability studies that while the first generator in an area may not initially result in a power oscillation problem, the subsequent addition of generation in the area or other system changes often results in a reliability need for all generation in the area to have PSS. Proactively installing PSS during generator commissioning is easier and much less expensive than adding it at a later date, and provides for additional damping to be added in a timely manner as system need require. In order to provide flexibility in maintaining the integrity and reliability of the transmission grid, Transmission Planning has determined that appropriately tuned PSS should be installed on all new resources interconnecting with the Southern Company transmission system.

Policy

Effective October 1, 2001, Southern Companies will require that all new generating facilities (with commercial operation date of January 1, 2003 or later) which connect to the transmission system have PSS installed on the unit. See addendums below for further clarification.

The recommended PSS type is a delta-P-omega type stabilizer (also known as integral of accelerating power type). Other types which are functionally equivalent to the delta-P-omega type may be accepted on a case-by-case basis. Special studies and field tests are required to tune PSS and to establish their settings. These studies and field tests will be the responsibility of the Interconnection Customer prior to commercial operation. It is anticipated that most of the time, the generator equipment vendor can be retained to perform the studies and tests. The Transmission Provider will perform other relevant studies at Interconnection Customer's cost, and will coordinate with the Interconnection Customer and the equipment vendor (or consultant) to establish a reliable setting for the PSS gain. The Transmission Provider also requires that the PSS tuning test documentation (which shall include the PSS dynamic model, final settings, and on-line step-in voltage with and without PSS in service) be provided by the Interconnection Customer within thirty (30) days of the completion of the testing and at least seven (7) days prior to the Commercial Operation Date.

The policy is that whenever a unit with PSS is on line, the PSS should be in service. If the PSS must be taken out of service because of equipment problems or for maintenance, the Transmission Provider must be notified immediately. The status of the PSS shall be provided to the Southern Balancing Area Operator and the Transmission Control Center on a continuous basis. The PSS must be properly tuned when it is commissioned. If on-going system studies show a need for a change in the tuning, the Transmission Provider may require the Interconnection Customer to re-evaluate the tuning and, if possible, reset the PSS parameters to more appropriate settings to preserve the overall reliability of the grid. No setting of the PSS should be changed without the prior approval of the Transmission Provider. The Interconnection Customer shall provide the final PSS test report to the Transmission Provider within thirty (30) days after the Commercial Operation Date.

Addendum 1: This policy is hereby clarified to require PSS only on generating facilities interconnecting to the transmission system (100 kV and above) which are rated greater than twenty (20) MW. However, if the interconnection studies indicate that generating facilities rated less than twenty (20) MW cause or contribute to a power oscillation problem, such generating facilities will also be required to install a PSS.

Addendum 2: This policy is hereby clarified to require PSS only on generating facilities which consist of a conventional synchronous generator(s). PSS will not be required for solar generation facilities or for wind generation facilities. However, if studies indicate that solar or wind generation facilities cause or

contribute to a power oscillation problem, such generating facilities will be required to provide a damping function specified by Transmission Planning.



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Transmission Policy No. 8

DOCUMENT CHANGE LOG:

| Revision # | Date | Description of Key Changes |
|------------|-----------------|---|
| 0 | October 1, 2001 | Initial document |
| 1 | April 28, 2004 | Document modified to add requirement to operate with PSS in service and to notify transmission provider if PSS must be taken out of service. |
| 2 | May 21, 2010 | Document modified 1) to clarify that units less than 20 MW do not have to install PSS unless system studies indicate a need. and 2) to make other minor changes regarding data reporting. |
| 3 | July 23, 2014 | Minor editorial changes and document modified to clarify that 1) the PSS requirement applies to > 100 kV connections and 2) solar generation facilities and wind generation facilities will not be required to install PSS unless system studies indicate a need. |