

## **Reliability Objective**

Power System Stabilizer (PSS) systems are used to minimize real power oscillations by rapidly adjusting the field of the generator to dampen the low-frequency oscillations. To ensure the Western Interconnection is operated in a coordinated manner under normal and abnormal conditions, the entity should develop controls to ensure that the PSS meets established performance criteria. Information is coordinated with the Transmission Operator to help ensure that the Transmission Operator's Operating Plan and Real-Time Assessments reflect the correct status of the PSS.

## **WECC** Intent

The potential failure points and guidance questions give direction to registered entities as they assess risk while designing internal controls specific to NERC Reliability Standards and Requirements. The Registered Entity may use this document as a starting point in determining entity risk. It is not WECC's intent to establish a standard or baseline for entity risk assessment or controls design.

*Note:* Guidance questions help an entity understand and document its controls. Any responses, including lack of affirmative feedback, will have no consequences on an entity's demonstration of compliance at audit.

\**Please send feedback to* <u>InternalControls@WECC.org</u> *with suggestions on potential failure points and* guidance questions.

## **Potential Failure Points and Guidance Questions**

**Potential Failure Point: (R1)** Failure to develop a policy on PSS systems that requires documentation be provided to the Transmission Operator.

- 1. Describe your entity's process to identify and document the applicable Transmission Operator for each generating unit.
- 2. Does your process specify which individual or role at the Transmission Operator should receive the written Operating Procedure or other document(s)?

**Potential Failure Point: (R1)** Failure to establish a process to identify and document circumstances during which the PSS will not provide an active signal to the Automatic Voltage Regulator (AVR).

1. Does your entity have procedures to identify and document generator operating conditions during which the PSS will not provide an active signal to the AVR?

**Potential Failure Point: (R1)** Failure to establish a process to identify events that begin the 180-day timeframe.

- 1. For upcoming PSS Commercial Operation dates, describe how the PSS commissioning process ensures that documentation is updated and notification is provided to the Transmission Operator.
- 2. For changes to the PSS operating specifications, describe how your change management process ensures documentation is updated and provided to the Transmission Operator.

**Potential Failure Point: (R2)** Failure to establish methods to monitor plant settings and conditions to determine whether the PSS is in service, and, if the PSS is not in service, a basis for determining the start time when the PSS went out of service.

- 1. Describe the method(s) your entity uses to monitor PSS status.
  - a. If the PSS status is monitored via an alarm, who receives the alarm? Does your entity have documented procedures to follow if an alarm indicates that the PSS is not in service?
  - b. If your entity uses a manual process to monitor the PSS status, how frequently does the verification occur?
  - c. Does your entity have an appropriate procedure that outlines steps if PSS is out of service for over 30 minutes?
- 2. Have you identified any specific circumstances, such as upon unit start-up or following software updates that would prompt personnel to check whether the PSS status has changed?

**Potential Failure Point: (R2)** Failure to establish procedures for identifying and communicating a reason the PSS is not in service.

- 1. If the PSS status change is planned, such as during planned testing or maintenance activities, has your entity established procedures for documenting the reason?
  - a. Do the procedures include a step to communicate the PSS status change to relevant personnel within the entity and to the Transmission Operator?
- 2. If the PSS status change is unplanned, such as the result of component failure, does your entity have strategies for investigating conditions to determine the reason and troubleshooting steps?

**Potential Failure Point: (R2)** Failure to establish steps for seeking agreement from the Transmission Operator for a PSS that is not in service.

- 1. Does your process define what constitutes "agreement"?
- 2. Who is responsible for seeking an agreement with the Transmission Operator?



- 3. Does the process define whom at the Transmission Operator is authorized to reach an agreement regarding PSS status?
- 4. How is the agreement documented?
- 5. Does the process include provisions for what to do if the Generator Operator does not reach an agreement with the Transmission Operator?

Potential Failure Point: (R3) Failure to establish procedures on how to tune the PSS.

- 1. Describe how your documented procedures ensure that the inter-area mode criteria are met (parts 3.1, 3.2, and 3.3)
- 2. How do you ensure that responsible personnel understand the criteria?
- 3. If an exception is identified under R3.5, describe how your documented procedures have steps to track PSS that require replacement or retrofitting.
- 4. Describe how your procedures for tuning PSS outline triggers and time frames required to tune the PSS.

**Potential Failure Point: (R4)** Failure to have a policy that requires a PSS be installed when replacing the voltage regulator or upgrading the existing excitation system such that it will support operation of a PSS.

**Potential Failure Point: (R4)** Failure to develop procedures for installing a PSS that ensure start-up testing is complete.

- 1. How do you define and communicate the dates used to establish a time frame for start-up testing?
- 2. How do you track start-up testing activities to ensure they do not miss the due date?
- 3. Describe how your procedures for installing a PSS ensure that inter-area mode criteria (R3) are met?
- 4. Describe how your procedure outlines appropriate steps and personnel needed for an installation and/or start-up testing?

**Potential Failure Point: (R5)** Failure to develop a process to track project status for replacing or repairing the PSS.

- 1. How do you identify whether PSS is still capable of meeting tuning specifications (R3)?
- 2. How do you define and communicate the dates used to establish a time frame for replacing or repairing a PSS?
- 3. Describe your procedures for replacing or repairing the PSS to ensure that time frames are met.

