



MB-PSS

Multiband Power System Stabilizer

The disturbances that occur on a power system cause various electromechanical oscillation modes on generators, affecting power system stability and transmission limits. With the advent of open markets, power systems are becoming increasingly interconnected internationally, creating (often insufficiently dampened) oscillation modes at frequencies as low as 0.1 Hz. In order to optimize power systems operated at their full potential and to ensure reliable, uninterrupted transmission service, it is important to have a device to control this phenomenon.

Electromechanical oscillations typically lie in the 0.04 to 4.0 Hz frequency range and are of three types: local (interunit and interstation), inter-area and system-wide. The multiband power system stabilizer (MB PSS) developed by Hydro-Québec's research institute effectively dampens all oscillation modes.

The new MB PSS is innovative in having settings for three distinct frequency bands so its response can be flexibly tuned to the different electromechanical oscillation modes existing on major power systems. Such flexibility improves the dynamic and transient stability of power systems and makes them more robust.

Flexible technology

Unlike conventional power or frequency stabilizers, which have just a single lead-lag filter to handle all oscillatory phenomena, the MB PSS has three adjustable working bands providing adequate settings over the entire frequency range. In addition to its multiband design, the stabilizer uses the rotor speed as its input signal, which it derives from generator terminal voltage and current readings. Since these signals are readily available on all generators, the installation process is greatly simplified.

The MB PSS has been shown to outperform conventional stabilizers both in tests and in use on the Hydro-Québec system. Since it was developed in 2003, about 25 MB PSSs have been added to generators or dynamic shunt compensators on the company's system.

Functional characteristics

The input variable, rotor speed, is derived from generator or compensator terminal voltage and current measurements. The MB PSS processes the input signal and then dampens target oscillation modes by modulating the generator or compensator terminal voltage as a function of the speed deviation.

The MB PSS is a single-box stand-alone stabilizer compatible with any analog or digital excitation system having an auxiliary analog input to its voltage regulator. The stabilizer is comprised of three circuit boards and a user-friendly keypad for parameter input, testing, startup and maintenance.

Distinguishing features

- > Performance matching or exceeding that of conventional stabilizers
- > Effective over two frequency decades (typically 0.04 to 4.0 Hz)
- > Dampening of electromechanical phenomena at lower, intermediate and higher frequencies
- > Auxiliary functions for parameter setting, self-monitoring, data logging and maintenance
- > Web-based remote communication option

For information:

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