Abstract

Low Frequency Oscillations (LFO) are a frequent adverse phenomenon which increase the risk of instability for the power system and thus reduce the total and availability transfer capability. LFO occur in power systems because of lack of the damping torque in order to dominance to power system disturbances as change in mechanical input power. In the recent past Power System Stabilizer (PSS) was used to damp LFO. FACTs devices, such as Unified Power Flow Controller (UPFC), can control power flow and increase transient stability. So UPFC may be used to damp LFO instead of PSS. In this research the linearized model of synchronous machine (Heffron-Philips) connected to infinite bus (Single Machine-Infinite Bus: SMIB) with UPFC is used and also in order to damp LFO, adaptive ANN damping controller for UPFC is designed and simulated. Simulation is performed for various types of loads and for different disturbances. Simulation results demonstrate that the developed ANN damping controller would be more effective in damping electromechanical oscillations in comparison with the conventional lead-lag controller.
References


Index Terms

Computer Science

Control Systems

Keywords
Low Frequency Oscillations (LFO)  Unified Power Flow Controller (UPFC)  Single Machine-Infinite Bus (SMIB) power system

Artificial Neural Network (ANN) damping controller