

Damping improvement of power system oscillations by using optimal coordinated design between PSS and SVC-based stabilizer

Abstract

The large expansion of electrical power systems usually results in problem of low frequency oscillations. Therefore, the conventional Power System Stabilizers (PSSs) used to solve this problem cannot provide an adequate damping of low frequency oscillations. Flexible AC Transmission System (FACTS) damping controllers are available for providing suitable damping for these oscillations. This paper, presents the simultaneous coordinated design of the multiple damping controllers between PSS and SVC-based stabilizer in a single machine infinitebuspower system. The coordinated design problem of multiple damping controllers is formulated as an optimization problem. Particle swarm optimization algorithm is applied in order to search optimal controlling parameters by maximizing the objective function based on the eigenvalue. The simulation results for a wide range of operation condition show that the coordinated design able to provide better damping and stability performance.

Keywords

Optimal coordination design; Power system oscillations; Pss; Svc-based stabilizer