Improvement of stability and reduction of system power fluctuations by using optimal PSS and parallel compensator adjustment using particle optimization algorithm

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low frequency oscillations (LFO) is the one of the important problems in power system operation. As the power system is caused the severe loading and the generators have not the suitable damping, LFO appearance is probable. This problem will be caused reduction of the loading level for maintenance of the system dynamic stability. The second solution is using Power system stabilizer (PSS) and Flexible AC Transmission Devices (FACTS). In this thesis, FACTS with conventional power system Stabilizers are utilized to improve dynamic stability. Based on, this research is carried on a modified Heffron-Phillips model of a single machine infinite bus (SMIB) system integrated with three FACTS consist of Static synchronous series compensator (SSSC), Static synchronous compensator (SATCOM) and unified power flow controller (UPFC). As well to damp oscillations quickly the PSS parameters are optimized using Particle Swarm Optimization (PSO) algorithm.

Keywords : Power system stabilizer, Static synchronous series compensator, Static synchronous compensator, unified power flow controller, Particle Swarm Optimization algorithm