OPTIMAL TUNING OF PSS AND TCSC CONTROLLERS IN A MULTIMACHINE POWER SYSTEMS USING PSO ALGORITHM

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Abstract

The objective of the work reported in this paper is to set the parameters of the PSO (Particle Swarm Optimization) based optimal PSS (Power System Stabilizer) and TCSC (Thyristor Controlled Series Compensator) controller in order to damp small-signal oscillation in a multimachine power system. An attempt has also been made to compare the performance of the TCSC controller with PSS in mitigating the small-signal stability problem. Power System Stabilizers have been employed as the first choice to improve power system oscillations. Nowadays PSS being mandatory controller associated with commercial generators its performance still gets affected by network configurations and hence installation of FACTS device have been suggested in this paper to achieve appreciable damping of system oscillations and to improve the small-signal stability. In this paper the PSO based tuned PSS and TCSC controller have been installed separately in a multimachine system and the results of small signal stability analysis have been represented employing eigenvalue and time domain simulation. It has been observed that the TCSC is more effective than PSS to improve the small-signal stability problem.