Abstract

A modified particle swarm optimization (MPSO) algorithm is utilized in this paper to find out the optimum design of Proportional-Integral-Derivative (PID) controller parameters that improves the stability of a Single-Machine Infinite-Bus (SMIB) system with Static VAR Compensator (SVC). The performance of the power system under different loading conditions is investigated by using three tuning methods. Namely, Ziegler-Nichols-PID, PSO-PID, and MPSO-PID. The simulation results show that the proposed MPSO-PID controlling technique has improved the system response as compared to the two other techniques, that because it gives minimum rise time and minimum settling time with no overshoot and approximately zero steady-state error. All simulations are carried out in MATLAB R2010a software environment.

References


Index Terms

Computer Science  Control Systems

Keywords

SMIB Power System  SVC  PID Controller  Ziegler-Nichols Tuning Method  PSO Algorithm

MPSO Algorithm

Power System Stability