Abstract

The Flexible AC Transmission System (FACTS) technology is a promising technology to achieve complete deregulation of power system based on power electronic devices, used to enhance the existing transmission capabilities in order to make the system flexible and independent in operation then the system will be kept within limits without affecting the stability. Complete closed-loop smooth control of voltage can be achieved using shunt connected FACTS devices. Static VAR Compensator (SVC) is one of the shunt connected devices, which can be utilized for the purpose of voltage and reactive power control in power systems. In this paper the considered structure of SVC consists of (TCR-FC) which is applied at SMIB system model, the dynamic equations for the (SMIB-SVC) model will be presented, the system equations expressed in terms of state space equations then by using MATLAB the plant of the system model will be presented under various loading conditions. A Neuro-PID controller model has been developed to improve on the response and performance of a conventional Proportional plus Integral plus Derivative (PID) controller which control the response of the plant model by developing a self-tuning/adaptive Neural-PID controller. The proposed Neuro-controller was developed using the back propagation algorithm. The ANN based PID
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(ANN-PID) controller compared with ANN controller through MATLAB simulation results. Comparison of performance responses of ANN controller and ANN-PID controller show that ANN-PID controller has quite satisfactory generalization capability, feasibility and reliability, as well as the accuracy in the system; the superiority of the performance of ANN over PID controller is highlighted under various loading conditions.

References


Index Terms
Keywords
SVC controller  power systems  neural network  back propagation algorithm  PID controller  self-tuning