

Investigations into Effect of Neural Network Predictive Control of UPFC for Improving Transient Stability Performance of Multimachine Power System

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Abstract : The paper presents an investigation into the effect of neural network predictive control of UPFC on the transient stability performance of a multi-machine power system. The proposed controller consists of a neural network model of the test system. This model is used to predict the future control inputs using the damped Gauss-Newton method which employs 'backtracking' as the line search method for step selection. The benchmark 2 area, 4 machine system that mimics the behavior of large power systems is taken as the test system for the study and is subjected to three phase short circuit faults at different locations over a wide range of operating conditions. The simulation results clearly establish the robustness of the proposed controller to the fault location, an increase in the critical clearing time for the circuit breakers and an improved damping of the power oscillations as compared to the conventional PI controller.

Keywords : identification, neural networks, predictive control, transient stability, UPFC