ARTIFICIAL NEURAL NETWORK-BASED
ADAPTIVE PI CONTROLLER
FOR REACTIVE POWER COMPENSATION

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ABSTRACT

This thesis proposed the use of Fixed Capacitor-Thyristor Controlled Reactor (FC-TCR) controlled by neural network-based adaptive PI controller for reactive power compensation of loads that vary frequently in time. Backpropagation algorithm was used to train the neural networks. The reactive power can be compensated simultaneously by selecting an appropriate amount of capacitive/inductive compensation by adjusting the firing angle of TCR. The control circuit is governed by computer based neural network, which replaces the traditional discrete load switching and makes the capability of rapid and dynamic balancing of the system possible. Simulation results demonstrate that the proposed method shows better performance than a conventional PI controller.

Keywords - fixed capacitor-thyristor controlled reactor, artificial neural network, reactive power compensation