Static power system security assessment via artificial neural network.

ABSTRACT

Maintaining system security is an important factor in the operation of a power system. The aim of this study is to evaluate the reliability using artificial neural network (ANN) in static security assessment to determine the security status of a power system. Feed Forward Back Propagation Neural Network is implemented to classify the security condition of IEEE 9 bus system. The input data of ANN are derived from offline Newton Raphson load flow analysis. The result obtained from the ANN method is compared with the Newton Raphson load flow analysis in terms of accuracy to predict the security level of IEEE 9 bus system and the computational time required by each method. The average time required by Newton-Raphson load flow analysis to evaluate security level of IEEE 9 bus system is 0.0481 seconds while the average time required by neural network is 0.0119 seconds. The accuracy of 13 hidden neurons feed forward back propagation neural network to predict the security level of IEEE 9 bus system is 98.57%. In conclusion, ANN is found to be reliable to evaluate the security level of IEEE 9 bus system.