

Evaluation for voltage stability indices in power system using artificial neural network

Abstract

At present, the evaluation of voltage stability assessment experiences sizeable anxiety in the safe operation of power systems. This is due to the complications of a strain power system. With the snowballing of power demand by the consumers and also the restricted amount of power sources, therefore, the system has to perform at its maximum proficiency. Consequently, the noteworthy to discover the maximum ability boundary prior to voltage collapse should be undertaken. A preliminary warning can be perceived to evade the interruption of power system's capacity. This paper considered the implementation of real-time system monitoring methods that able to provide a timely warning in the power system before the voltage collapse occurred. Numerous types of line voltage stability indices (LVSI) are differentiated in this paper to resolve their effectuality to determine the weakest lines for the power system. The line voltage stability indices are assessed using the IEEE 9-Bus and IEEE 14-Bus Systems to validate their practicability. Besides that, this paper also introduced the implementation of real-time voltage stability monitoring by using Artificial Neural Network (ANN). Results demonstrated that the calculated indices and the estimated indices by using ANN are practically relevant in predicting the manifestation of voltage collapse in the system. Therefore, essential actions can be taken by the operators in order to dodge voltage collapse incident from arising.