Application of TCSC and SVC to Enhance the Power System Static Voltage Stability

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Abstract:

In this paper, the performance of two types of FACTS devices in order to enhance the power system static voltage stability has been investigated. These devices include Static Var Compensator (SVC) and Thyristor Controlled Series Capacitor (TCSC). The modeling of the Single Machine Infinite Bus (SMIB) and aforesaid devices has been made up in steady state mode with disregarding of the generator limitations. The incremental load changes will cause the voltage collapse phenomenon, load power factor decrease and load current increase. Consequently, the voltage will have more decrement and therefore voltage will collapse, and then the power system will be encountered with instability problem. This paper presents a scale of the Voltage Collapse Proximity Indicator (VCPI) for evaluation of voltage stability and its role in transmission line power flow. Application of the mentioned compensators in power system will improve the voltage stability and power flow in transmission line. The simulation results of this paper reveal the good efficiency of TCSC and SVC in reducing the voltage collapse and improving the bus voltage.

Keywords: FACTS, TCSC, SVC, VCPI, SMIB

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