



Single Machine Infinite Bus System Stability Improvement using FACTS Devices

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Abstract: The Objective of this thesis is to study the transient stability under the 3-phase fault with and without controllers. Transmission networks of modern power systems are becoming increasingly stressed because of growing demand and restrictions on building new lines. One of the consequences of such as stressed system is the threat of losing stability following a disturbance. Flexible ac transmission system (FACTS) devices are found to be very effective in a transmission network for better utilization of its existing facilities without sacrificing the desired stability margin. Flexible AC Transmission System (FACTS) such as Static Synchronous Compensator (STATCOM) and Static Synchronous series Compensator (SSSC), employ the latest technology of power electronic switching devices in electric power transmission systems to control voltage and power flow. A static synchronous compensator (STATCOM) is a shunt device of the flexible AC transmission systems (FACTS) family. The STATCOM regulates voltage at its terminal by controlling the amount of reactive power injected into or absorbed from power system. When system voltage is low, STATCOM generates reactive power and when system voltage is high it absorbs reactive power. In this Thesis different STATCOM controllers i.e. based on SMIB system based are designed for improving transient stability of single machine infinite bus (SMIB) systems. Proposed controllers are implemented under MATLAB/SIMULINK environment. Results of Controllers installed with SMIB system and compared with STATCOM between SSSC controllers.

Keyword: FACT, STATCOM, Transmission, Utilization