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Technical Comparative Study Between STATCOM and SSSC Devices for Steady State and Transient Stability of Power System

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ABSTRACT

The aim of this paper is to give a comparison study between two very important and recent shunt /series FACTS devices, which are, Static Synchronous Compensator STATCOM and Static Synchronous Series Compensator SSSC. The study discusses and compares the location of both devices in power network, and their applications to solving power system problems, such as, power flow control, increase of transmission capability, voltage control, as well as the impact of these devices to improve system stability when a three-phase fault is applied. The capability of the system to operate when one element is out of service was tested in the presence of these devices. In addition, the Critical Clearing Time CCT of the system with and without FACTS devices was determined, the IEEE 14 bus was selected to performed this study by using (PSAT software). The results showed that the STATCOM is better than SSSC for voltage regulation, while the SSSC is best in core of controlling the flow of power and damping out the oscillation.

Keywords: FACTS devices, STATCOM, SSSC, power flow control, voltage control, system stability improvement.