

Dynamic Modeling and Simulation of a STATCOM/SMES Compensator in Power Systems

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Abstract : The advent of Flexible AC Transmission Systems (FACTS) is giving rise to a new family of electronic equipment emerging to controlling and optimizing the performance of power system, e.g. STATCOM. Static synchronous compensator (STATCOM) is one of the most widely used FACTS devices. This paper presents the integration of STATCOM coupled with superconducting magnetic energy storage (SMES) device in order to provide power oscillation damping in power systems. The additional of energy storage allows the combined compensator to exchange both reactive and active power with the ac network and also capability of the STATCOM is enhanced. This paper describes the structure and characteristics of STATCOM/SMES. In addition, using a proper control scheme, STATCOM/SMES is tested on an IEEE 3-bus system and more effective performance of the presented STATCOM/SMES compensator is evaluated with alone STATCOM through the dynamic simulation by using PSCAD/EMTDC software.

Keywords : STATCOM/SMES, Oscillation Damping, Control, Power System.

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