

Providing Additional Advantages for STATCOM in Power Systems by Integration of Energy Storage Device

Authors : Reza Sedaghati

Abstract : The use of Flexible AC Transmission System (FACTS) devices in a power system can potentially overcome limitations of the present mechanically controlled transmission system. Also, the advance of technology makes possible to include new energy storage devices in the electrical power system. The integration of Superconducting Magnetic Energy Storage (SMES) into Static Synchronous Compensator (STATCOM) can lead to increase their flexibility in improvement of power system dynamic behaviour by exchanging both active and reactive powers with power grids. This paper describes structure and behaviour of SMES, specifications and performance principles of the STATCOM/SMES compensator. Moreover, the benefits and effectiveness of integrated SMES with STATCOM in power systems is presented. Also, the performance of the STATCOM/SMES compensator is evaluated using an IEEE 3-bus system through the dynamic simulation by PSCAD/EMTDC software.

Keywords : STATCOM/SMES compensator, chopper, converter, energy storage system, power systems

Conference Title : ICERE 2015 : International Conference on Environment and Renewable Energy

Conference Location : Dubai, UAE

Conference Dates : September 13-15, 2015