World Academy of Science, Engineering and Technology
International Journal of Electrical and Computer Engineering
Vol:9, No:08, 2015

PWM Based Control of Dstatcom for Voltage Sag, Swell Mitigation in Distribution Systems

Authors : A. Assif

Abstract : This paper presents the modeling of a prototype distribution static compensator (D-STATCOM) for voltage sag and swell mitigation in an unbalanced distribution system. Here the concept that an inverter can be used as generalized impedance converter to realize either inductive or capacitive reactance has been used to mitigate power quality issues of distribution networks. The D-STATCOM is here supposed to replace the widely used StaticVar Compensator (SVC). The scheme is based on the Voltage Source Converter (VSC) principle. In this model PWM based control scheme has been implemented to control the electronic valves of VSC. Phase shift control Algorithm method is used for converter control. The D-STATCOM injects a current into the system to mitigate the voltage sags. In this paper the modeling of D¬STATCOM has been designed using MATLAB SIMULINIC. Accordingly, simulations are first carried out to illustrate the use of D-STATCOM in mitigating voltage sag in a distribution system. Simulation results prove that the D-STATCOM is capable of mitigating voltage sag as well as improving power quality of a system.

Keywords : D-STATCOM, voltage sag, voltage source converter (VSC), phase shift control
Conference Title : ICPSE 2015 : International Conference on Power Systems Engineering
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : August 24-25, 2015