POWER QUALITY IMPROVEMENT IN POWER DISTRIBUTION SYSTEMS USING D-STATCOM

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ABSTRACT

The quality of electric power is one of the main branches in power system study. There are various power quality problems faced by the utilities like: voltage sag, flicker, electrical noise, harmonic distortion and different disturbances. So, it is very important to use the devices that can solve the power quality problems. D-STATCOM (distribution static compensator) is represented as one from FACTS devices used in power system as power electronic shunt device that absorbs and provides reactive power to solve power quality problems in power distribution systems. This paper represents simulation of IEEE 15 bus test system with using the sensitivity index is the effective method for optimal location of D-STATCOM in the test system. D-STATCOM controller is achieved by PI controller and used to mitigate voltage sag under various conditions such as: load increasing, decreasing, line outage and single line to ground fault (SLG) using MATLAB R2014a simulink tool box.

Keywords: D-statcom, FACTS, MATLAB Simulink, power quality, PWM, Voltage sag, Sensitivity index.