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(57) Abstract :

The rapidly increasing utilization of power electronic based loads is leading to power quality concerns in the distribution networks. The power quality issues such as current harmonics, voltage variations, poor Power Factor and reactive power burden can be mitigated with the help of the active power filters in the modern grid integrated power systems. The present invention disclosed herein is a Novel Method of Power Quality Enhancement in Grid Integrated System using PV-STATCOM comprising of Wind Generator and Power Electronic based Non-Linear Load along with PV-Statcom for power quality enhancement. An accurate control strategy known as the unit vector template method is responsible for the generation of reference current signals, which are used to trigger the electronic valves of voltage source converter based PV-Statcom in order to activate its dynamic operation for enhancement of power quality in the proposed test model. The present invention depicts the mitigation of current harmonics, the injection of active power and the compensation of reactive power in a grid-integrated system. The disclosure provides the dynamic performance of Voltage Source Converter (VSC) based PV-Statcom as Active Power Filter and Reactive Power Compensator for enhancement of power quality issues in the grid integrated system along with the design aspects of PV-Statcom for rating fixation of various components for its better performance. With the help of PV-Statcom dynamic performance, the current harmonics are completely mitigated along with the reactive power compensation, thereby magnifying the utilization factor of the grid-integrated system for magnification of power quality.

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