257. PERFORMANCE ANALYSIS FOR SHUNT ACTIVE FILTER BASED ON P-Q AND SDM THEORY

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The Intensive use of Power Converters and othe rnon-linear loads, result in an increasing deterioration of the power systems voltage and current waveforms. The presence of harmonics in the power lines results in greater power losses in distribution. To suppress the harmonics, filters are used. The Active Power Filter uses a voltage source inverter to produce the harmonic current components that cancel the harmonic components due to non-linear loads. The switching of the power electronics devices in the shunt active power filter is based on reference compensation current, which is determined by different algorithms. In this project, simulation setup has been developed using MATLAB and performance of three-phases hunt active power filter is studied using different control techniques that are used to generate the reference compensation current, namely instantaneous active and reactive (p-q) theory and synchronous detection method for the control of reactive power and harmonics. Reference current generated by each of the above method is compared with the actual current fed by theVSI circuit and gate pulses of the VSI are modified so that the actual current is equal to the reference current. A comparison is given for different values of load. Capacitor voltage is keptconstant by another closed loop with PID controller. Simulation results are obtained for the two methods. From the simulation result it is observed that the total harmonic distortion factor hasbeen decreased nearly to10% as compared to system without shunt active power filter and the power factor is also improved.

Index Terms – Instantaneous Real power and Reactive power, Synchronous Detection method active and reactive power control, power quality problems.

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