

## **IMPROVEMENT OF POWER QUALITY USING FACTS CONTROLLERS**

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### **Abstract**

Power electronic loads introduce harmonic currents into the utility power system. This paper presents harmonic reduction techniques, which satisfy the current harmonic limits. The techniques which are considered here, are active filter, hybrid filter and zig-zag transformer rectifier as FACTS controllers. According to rectifying or inverting operation of HVDC converters, reactive power is absorbed from the bus in which the converter is connected. In either case of operation reactive power compensation in AC side of converters is quite necessary. In addition to reactive power compensation, due to nonlinear behavior of power electronics converters. The characterized & uncharacterized harmonics are produced in both sides of links and often they are filtered by passive & active filters. There has been a great growth in application of AC/DC links and therefore the harmonic reduction and reactive power compensation method should be improved but this increases the complexity in hardware and control strategies and also increases the total cost of links. In this paper the new switching patterns of capacitance for achieving continuously controlled compensation and reduction of harmonics produced by HVDC converters are described. This method has a simple structure and easier switching control strategies compared to active filter configuration alone.

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**Keyword:** Active filter, Hybrid filter, zigzag TR.rectifier, MATLAB-SIMULINK, Harmonics, HVAC systems.