

## Single Tuned Shunt Passive Filter Based Current Harmonic Elimination of Three Phase AC-DC Converters

**Authors :** Mansoor Soomro

**Abstract :** The evolution of power electronic equipment has been pivotal in making industrial processes productive, efficient and safe. Despite its attractive features, it has been due to nonlinear loads which make it vulnerable to power quality conditions. Harmonics is one of the power quality problem in which the harmonic frequency is integral multiple of supply frequency. Therefore, the supply voltage and supply frequency do not last within their tolerable limits. As a result, distorted current and voltage waveform may appear. Attributes of low power quality confirm that an electrical device or equipment is likely to malfunction, fail promptly or unable to operate under all applied conditions. The electrical power system is designed for delivering power reliably, namely maximizing power availability to customers. However, power quality events are largely untracked, and as a result, can take out a process as many as 20 to 30 times a year, costing utilities, customers and suppliers of load equipment, a loss of millions of dollars. The ill effects of current harmonics reduce system efficiency, cause overheating of connected equipment, result increase in electrical power and air conditioning costs. With the passage of time and the rapid growth of power electronic converters has highlighted the damages of current harmonics in the electrical power system. Therefore, it has become essential to address the bad influence of current harmonics while planning any suitable changes in the electrical installations. In this paper, an effort has been made to mitigate the effects of dominant 3rd order current harmonics. Passive filtering technique with six pulse multiplication converter has been employed to mitigate them. Since, the standards of power quality are to maintain the supply voltage and supply current within certain prescribed standard limits. For this purpose, the obtained results are validated as per specifications of IEEE 519-1992 and IEEE 519-2014 performance standards.

**Keywords :** current harmonics, power quality, passive filters, power electronic converters

**Conference Title :** ICPET 2017 : International Conference on Power Engineering and Technology

**Conference Location :** London, United Kingdom

**Conference Dates :** April 24-25, 2017