AN ACTIVE FILTER AND PASSIVE FILTER TECHNIQUES ANALYSIS OF HARMONIC MITIGATION USING PSIM SOFTWARE

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ABSTRACT

Active power filters and Passive power filter have been broadly used for harmonic elimination. This paper presents an active filter and passive filter connected in parallel with three phase 12Pulse AC/DC converter to mitigate the harmonics generated. The simulation presented in PSIM computer simulation software. The results show that the circuits with filter perform better than the original circuit and satisfy the harmonic limitations with respect to the objective of minimizing the total demand distortion of harmonic currents and total harmonic distortion (THD) of voltages. It has been also established that the power filter overcomes supply system disturbance while maintaining an acceptable level of system power supply. The effective operation of both filter are demonstrated and the potentials are illustrated with a case study.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Power quality is an important measure of an electrical power system. The term power quality means to maintain purely sinusoidal current waveform with purely sinusoidal voltage waveform. Power supply normally produces a clean and purely sinusoidal current waveform in nature. This sinusoidal waveform is regarded a pure form of the AC voltage and any deviation from it is described as distortion. More and more types of load absorb non-sinusoidal from the power system. These nonlinear loads draw non-sinusoidal current from the sources, causing non-sinusoidal voltage drops across the system [1].

Various harmonic-mitigation techniques have been proposed and applied in recent years. Harmonics reduction can be done either by structural modifications in the drive system or by using external filtering. It is well known that the harmonic distortion can be reduced with the installation of a power system filter. The structural modifications can be strengthening the supply, to use 12 or more pulse drive, to use a controlled rectifier or to improve the internal filtering in the drive. In this contribution, an active power filter and passive power filter is proposed for the determination of the filtering currents for harmonic mitigation [2, 9].