Abstract

The Novel control strategy for reduction of harmonics in three-phase four-wire distribution systems was presented in this paper. The single phase loads connected to 3P4W distribution system causes an unbalance current which results in the flow of zero sequence harmonic component in the neutral conductor of the distribution system. This effect leads to over-burden on neutral conductor and also de-rates the distribution transformer. A Unit Vector Control (UVC) based series active filter was proposed to reduce the harmonic currents in the neutral conductor during both balanced and unbalanced loading conditions. In this method a series active filter is placed in series with the neutral conductor. The proposed method reduces the harmonics, improves the power factor and balances the asymmetrical loads. The detailed analysis of the proposed method based on unit vector control was presented. The simulation results based on MATLAB/SIMULINK were performed to verify the effectiveness of the proposed method. The results are found to be quite satisfactory in mitigating harmonics in the neutral current.
A New Control Method for Series Active Filter in Distribution System using Unit Vector Control

ences

- F. Z. Peng, H. Akagi, and A. Nabae, "A new approach to harmonic


- S. Bhattacharya and D. Divan, &quot;Synchronous frame based controller implementation for a hybrid series active filter system,&quot; IEEE/IAS Conference Proceedings, 1995, pp. 2531-2540.

**Index Terms**

Computer Science  
Control Systems

**Keywords**

Power Quality  Total Harmonic Distortion (THD)  Active Power Filters  Neutral Conductor
A New Control Method for Series Active Filter in Distribution System using Unit Vector Control