Julian Wosik

" ACTIVE COMPENSATION OF REACTIVE POWER IN ELECTRIC NETWORKS OF UNDEGROUND

MINING"

   The dissertation addresses the problem of efficient reactive power compensation in power networks (isolated) with non-sinusoidal current and voltage waveforms. Provides an analyses of the most important instantaneous power theories with emphasis on practical use of the physical components of the current (CPC) theory. Presents and discusses the results of investigations of current and voltage signals in industrial networks supplying non-linear loads that were carried out both under real and laboratory conditions of operation. After selecting the theoretical basis of the compensation the filter control algorithm was developed based on the theory of active physical components of the current. Appropriate simulation study of efficiency of the proposed method of compensation for both the non-linear and unbalanced loads were carried out. Based on the results of simulation studies has been designed and executed a laboratory physical model of the active power filter for the underground mining application. The appropriate tests of efficiency of the developed reactive power compensation system were performed and conclusions as well as recommendations for practice were formulated.