The problem of the electrical energy quality ensuring in combined power supply systems.

Aladin M. E., Zimin R. Yu., Sychev Yu. A.

The article describes and substantiates the main problems associated with ensuring the quality of electrical energy in combined power supply systems. The main operating modes of combined power supply systems are outlined. An overview of the main methods for ensuring the quality of electrical energy is given, including structural methods, parametric methods, and the use of separately connected specialized devices. A method for assessing the level of electrical energy quality in combined power supply systems is proposed based on the analysis of the main paths of non-sinusoidal waveform formation with the identification of the components of the resulting power factor. A method for improving the quality of electrical energy in combined power supply systems is proposed based on the use of multifunctional filter-compensating devices based on several active converters. An analysis of various topologies of passive filters at the output of the series converter of the multifunctional filter-compensating device, which have different effects on the quality indicators of electrical energy, is performed. The most effective topology of such a filter for use in combined power supply systems is identified.

Key words: combined power supply system, multifunctional filter compensating device, power quality.