

NEW DIRECTIONS IN TRANSFORMERS DESIGNING

The electric energy – is the main form of energy which is used by people. Transformer – is the main transfer link in the electricity network. Parameters and properties of transformers affect on their behavior in complex operational network a crucial way. The reliability of electricity supply and on the efficiency of industrial production depend on it. To prevent an automatic shutdown of a large number of consumers during violation of the reliability of power transformer equipment capable to withstand notable asymmetry of three-phase network voltage, is used. That would preclude the electrical system overloading and a massive security operations. Transformers, which are used nowadays, in practice, do not have such properties.

Mathematical calculations and computer simulations results indicate a significant improvement of transformers parameters and properties at increasing coverage of winding by magnetic system.

The new principles of designing magnetic systems of transformers are proposed. Improvement of the flow of electromagnetic processes in transportation is achieved by selecting the correlations of basic geometric dimensions of the magnetic system that provides maximum windings coverage in space and size-symmetric. As a result, a significant improvement of specifications and new features of transformers we achieved: an automatic regulation of balancing voltage of asymmetrical load.

Conversion of electrical energy without disfiguration, automatic or adjustable voltage balancing phases in the case of asymmetrical loading is possible by using transformers with three-dimensional magnetic system and symmetrical placement phase windings on it.

A new approach to the transformers designing is based on creation of conditions for optimal flow of electromagnetic processes in the magnetic systems construction. In practice, we can notice, that magnetic system covers a maximum possible area of electrical windings of the transformers. This technique solution led to improved features of transformers (relative low value of current idling, reducing the eddy current loss in the magnetic wire, increasing the relation between unit voltage and the geometric sizes).

The suggested transformers' constructions are most effective in industrial use on the transmission network and distribution of electricity.