P. F. Gogolyuk, T.M. Hrechyn, A. O. Parfenyuk

Lviv Polytechnic National University,

department of power distribution systems of

industrial enterprises, cities and agriculture

A SYNTHESIS OF THE POWER DISTRIBUTION SYSTEMS OF THE INDUSTRIAL OBJECTS ON THE BASIS OF METHODS OF DISCRETE OPTIMIZATION

Determining of the optimal location of the transformer substations establishing, distribution of loading between them, a search of optimal routes of the electric lines gasket is a basis to construct economically effective power distribution system of industrial object. Till now these project procedures do not have clear mathematical formulation and unambiguous algorithmic formalization under condition of the limited possibilities of computing facilities. Among project procedures of the operating technology used for planning of the power distribution systems they have the lowest automation level. It is predefined by essential complexity of the general optimization task of synthesis of chart of the power distribution system of industrial object because of the presence of discrete variables, that is determined by properties of the designed objects.

The goal of the research is a development of the effective method of synthesis of charts of the power distribution systems of industrial objects in order to increase the efficiency of functioning of intellectual CAD intended for planning of the power distribution systems.

Project procedures of intellectual CAD systems intended for planning of the power distribution systems are based on application of such algorithms of discrete optimization as branches and limits, dynamic programming, search on the graphs of A-star, Dijkstra's algorithm and heuristic methods. The program implementation of the intellectual CAD for planning of the power distribution systems using the C^{++} language was carried out.

Conclusion. An expediency and efficiency of application of the discrete optimization methods to improve the automated planning technology for the power distribution systems of industrial objects was shown. On the basis of their application an essential increasing of automation level of modern CAD intended for planning of the power distribution systems can be achieved. The possibility of gradual transition to development of high-efficiency intellectual CAD for planning of the power distribution systems considering the world tendencies is explained.