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**Choosing the optimal location of distribution substations (switchgear) in networks of power supply companies considering external power lines.**

The method of choice of the optimal location of the main power distribution substations (DS) , switchgear (SG), power supply companies considering external power lines has been offered.

Choice of the best location of distribution network is carried out by a combined criterion of discounted profits of the company that takes into account the costs of construction and operation of transmission lines.

Similar expressions to identify the location coordinates of DS (SG) with and without taking into account external power lines that corresponds to the maximum discounted profit were obtained. It is shown that for the same nominal voltage distribution network and the external power line SG, the optimal placement of the SG is at the point that is substantially displaced relatively to the center of the electrical loads in the direction of the power supply (main substation). If the voltage external power line is chosen to be higher than the selected nominal voltage of distribution network, the coordinates of DS are almost identical with the center of electrical loads.

The choice of the ultimate supply scheme of distribution substations of power supply networks should be performed on the basis of technical and economic comparison of options of schemes and all the costs for construction of main power distribution substations (DS) , switchgear (SG), and transmission lines should be considered..

The technique can be used for the design and reconstruction of electrical distribution networks of electricity supply companies and enterprises.