AN ALGORITHM FOR ESTIMATION OF EFFICIENCY OF POWER SUPPLY VARIANTS

Arkhipova O.V.

Yugra State University

The course on improving energy efficiency gives special importance of the technical and economic analysis of the decisions made in new construction, modernization and the increase in available infrastructures facilities. The development of the oil and gas sector and housing maintenance and utilities of the Khanty-Mansiysk Autonomous Okrug - Yugra (KhMAO) requires the synthesis and reconstruction of electric power industry. Availability of remote customers, and adverse geotechnical conditions of KhMAO that hinder the construction, make in some cases more efficient selection of independent sources of electric power supply. Along with that, the developing programs of infrastructure development of region and adjacent districts, one of which is the "Ural industrial - Ural Polar", move the boundary of the effectiveness of the variants of electric power supply to consumers. Diversity of objects in Yugra, rational choice of power supply diagram of which is implicit, actualizes the development of techniques for technoeconomic study and their automation.

Cost-effectiveness analysis of application of electric power supply system.

Cost-effectiveness analysis is performed by comparison of variants of technical solutions. Such calculations can be carried out by at least reduced costs, which represent the amount of operational costs and one-off investments, reduced to an annual dimension in accordance with the established norm coefficient.

Software implementation of the estimation algorithm.

Having taken for a basis the above-mentioned methodology, the authors developed the program code. The operator using the primary information about the object receives the indicators of economic efficiency, which could later be used to justify variant of electric power supply.

A The calculations were performed using the developed programs, taking into account the following peculiarities:

1.Supports from used oil pipes are used during the construction of electrical transmission lines according to the type design. The wire section is made from 70 mm2 for convenience of installation and operation.

2.Park of cycle-independent stations and complete substations is equipped according to considerations of unification. Capacity of electric installation, as a rule, does not exceed 1000 kVA.

3.Unstable boggy ground of the region determines the high cost of construction of electrical transmission lines and the cost of its operation.

4.The operating time is close to the maximum.

It is necessary to note the fact that the choice of the variant made by the method of present costs, needs interpretation of values, on which this indicator differs in compared options. If the quantities of autonomous and centralized variants differ by less than 10%, the choice cannot be considered correct because the usual accuracy of the source data for the feasibility analysis is in a confidence range of ±10%. If one variant is more economic other not more than by 10%, they should recognize them as equal economic. In this case, the choice should be supplemented by other criteria, such as minimum investment, minimum of material, energy or complexity capacity, mobility or reliability of electric power supply, etc.