MODELLING OF THE UNIFIED NATIONAL ELECTRICAL NETWORK DEVELOPMENT

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The unbundling of the electricity business has raised new challenges that the restructured industry faces. Expanding the transmission network through the construction of new lines or the update of existing ones increases the amount of electric energy that can be traded and the number of generators and consumers that can take part in the market. Transmission system provides nondiscriminatory, effective and competitive environment for participants. Hence, the traditional cost-minimization formulation is no longer suitable to solve transmission expansion problem in market conditions. To evaluate efficiency of network expansion the comparison of investment and social welfare is needed [1]. This requires a coordinated approach to the optimization of the generation and transmission operation and development. The mathematical model considered in the paper is a mixed-integer linear programming formulation for the static transmission expansion problem in the conditions of electric energy market. The model allows to take into account discrete nature of investment, different operating conditions while modeling market with perfect competition. The proposed methodology is applied to the network of unified energy system of Russia based on the real data. The obtained results are verified and compared with official forecasts.

REFERENCES

1. P. S. Drachev. *Market-based transmission expansion model* // Vestnik of Irkutsk state technical university. – 2013, №1, pp. 125-134.