DOI: https://doi.org/10.15407/techned2019.01.0 68

JUSTIFICATION FOR USE OF VOLTAGE CLASS 20 KV IN URBAN ELECTRICAL NETWORKS

Journal	Tekhnichna elektrodynamika
Publisher	Institute of Electrodynamics National Academy of Science of Ukraine
ISSN	1607-7970 (print), 2218-1903 (online)
Issue	No 1, 2019 (January/February)
Pages	68 – 71

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Abstract

For biradial power supply networks it was derived an objective function that allows to analyze

the effect of technological and economic factors on the efficiency of power supply. It was found that utilizing the voltage class of 20 kV in the urban power supply networks would be efficient only when they are constructed with transformers of unit capacity 630 kVA and aluminum cables of 240 mm^2 or larger cross-section. Analytic expressions were derived and visualizations were created to analyze minimal specific density of electric load and maximum distance between electric substations for which construction of power supply network of 20 kV is justified as a function of allowed outage time for the network. References 6, figure 3.

Key words: power supply network, biradial structure, economic efficiency, integral effect, payback period, objective function, power loss.

Received: 02.03.2018
Accepted: 18.05.2018
Published: 10.01.2019

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