THE FEASIBILITY OF IMPLEMENTING AESAS IN RURAL NETWORKS

Dudnikov S.M., Ph.D., associate professor, Zasukha O.M., master's student,
(SBTU, Kharkiv, Ukraine)
State Biotechnological University

Обґрунтовано доцільність використання в мережах з нижчим класом напруги 0,4 кВ PLC – технологій в системі АСКОЕ

An important factor in reducing the cost-effectiveness of power supply systems of industrial enterprises is the imperfect state of schemes for controlling and accounting for the amount of energy used and the level of their exploitation.

From the analysis of the power supply systems of Ukraine [1], it was established that the largest losses of electrical energy (26%) are observed in the network with a voltage of 0.4 kV (Fig.1).

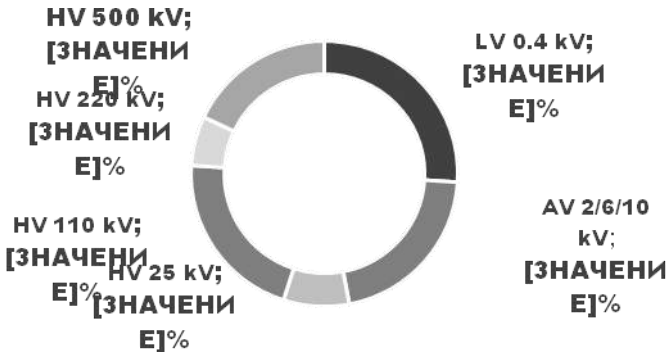

Fig. 1 - Electricity losses in electrical networks with different voltage levels.

Reducing losses is recommended by implementing an automated electrical energy control and metering system (AESAS) using a PLC network [2].

The main advantage of PLC technology is the ability to use existing electrical networks for data transmission. The features of the use of PLC technology are: 1 - A small number of RF channels on a separate power transmission line; 2 - low level of linear interference; 3 - the ability to select the frequency of data transmission and communication channels regardless of the channel frequencies in neighboring areas..

Analysis of existing electricity consumption data transmission systems in AESAS showed that the most economically justified and technologically acceptable is the use of PLC technology, taking into account the need for effective protection against electromagnetic interference while ensuring adequate bandwidth.

List of references

1. Дудніков С. М. Методи підвищення ефективності функціонування комбінованих систем енергопостачання споживачів АПК: дис. … канд. техн. наук: 05.14.01 / Дудніков Сергій Миколайович. – К., 2011 - 278 с.

2. Попадченко, С., Дудніков, С. (2022) «Перспективи розвитку сільських інтелектуальних електричних мереж», Науковий журнал «Інженерія природокористування», (1(23), с. 120-125. doi: 10.5281/zenodo.6824085