

EVALUATION OF ENERGY CHARACTERISTICS OF THE PROCESS OF WASTEWATER TREATMENT AGRO-INDUSTRIES ELECTRICAL COMPLEXES

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Analyzed urgency Energy Efficiency in agricultural wastewater treatment facilities. Reviewed degree of purification processes energy. The economic effect of energy savings on water purification; proposed and tested criteria of energy efficiency management system electrotechnological water treatment systems.

Water purification, sewage water treatment complex electrical management system, environmental safety.

Wastewater industrial facilities in many ways exceed the established norms for discharge into water bodies. Some of the largest deviations observed concerning suspended particles (100 - 1000), BOD (30 - 100), nitrates (10 times), due to the production technology. As a result, the concentration of environmental pollution on 1 km² 6.5 times more than in the US, and 2 - 3 times in comparison with the European Union. The quality of the environment is closely pozv'yazku the quality of surface and even underground water.

The purpose of research - analysis of power systems electrical characteristics of wastewater treatment facilities and agricultural determine ways to improve energy efficiency.

Subject to production testing and theoretical developments, and offer a universal criterion for assessing the energy efficiency of electro-technological equipment Water treatment:

$$EF_y = \frac{\left[\left(\frac{L1_{\text{aux}} - L1_{\text{3ad}}}{L1_{\text{3ad}}} \cdot 100\% \right) + \dots + \left(\frac{LN_{\text{aux}} - LN_{\text{3ad}}}{LN_{\text{3ad}}} \cdot 100\% \right) \right] \cdot \sum_{i=1}^N Q_i}{\sum_{i=1}^N W_i} \% / \text{KW}. (1)$$

where L_{vyh} - the actual value of the parameter estimation of water quality; L_{zad} - set (standard) value of the parameter estimation of water quality; Q - working equipment, hours W - electricity spent on water treatment, $kVt \cdot \text{hod}$; N - number of parameters of water quality assessment (usually correspond to the number of units that operate in water).

During the two-parameter analysis built dependence criteria EFU two conventional indicators of quality cleaning (L_1 , L_2) (Fig. 1). A normalized grew from 10% to 10% (step - 1%). Another varied inversely with the same step in the same range.

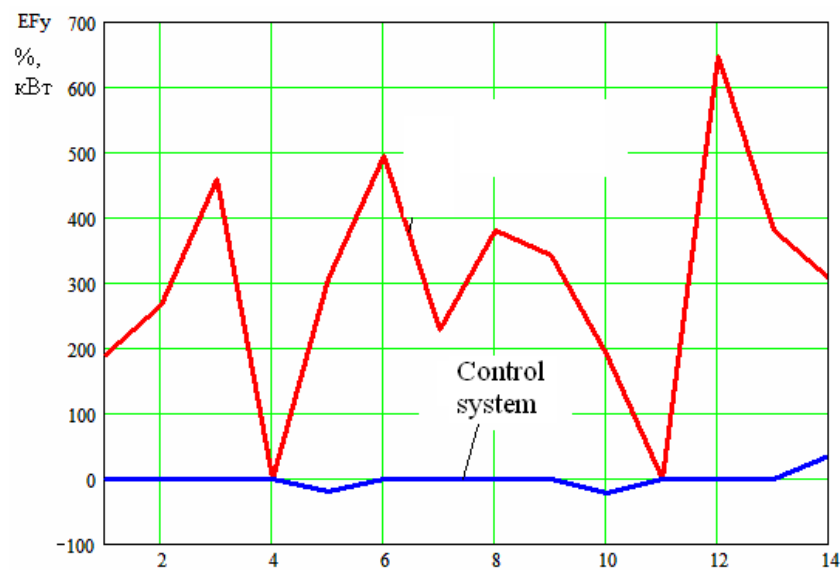


Fig. 1. improved energy efficiency criteria

The developed test efficiency can provide a basis for the comprehensive management of water purification systems, wastewater agricultural enterprises.

Conclusion

In the purification of waste water facilities in different agricultural methods and means largely used energy resources (15% of energy consumption - at the standard cleaning), so energy efficient solutions, including control systems, will improve the profitability of agricultural production (term cost recovery for Firmware vehicles - up to 2 years) and ensure environmental safety of the region where the business is located.