INFLUENCE OF FREQUENCIES ON TECHNOLOGICAL AND ENERGY CHARACTERISTICS OF FEED MILL

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Deviations power quality parameters on normalized values in asynchronous electric drives is a violation of the normal course of technological processes, production of low-quality products and reducing the service life of electric motors.

In dismissing frequencies changing angular speed of the engine, which in turn causes a change of process and power characteristics of working machines.

The purpose of research - to establish the impact of frequency deviation current on technology and energy characteristics of feed mixers.

Materials and methods of research. The analysis of the angular speed asynchronous electric rejecting frequencies conducted using the theory of the electric relating to electromechanical properties of electric motors, power transmission characteristics of working machinery, electric power and steady application of mathematical modeling.

In experimental studies by changing the frequency of the current frequency converter firm "Mitsubishi" and the measured angular velocity tachometer feed mixer C-12. It was determined uneven mixing and specific energy consumption.

Results. Angle engine speed varies in direct proportion to frequency current.

Experimental research of uneven mixing of feed changes when you change the frequencies of the engine showed that this dependence is nonlinear (Figure 1). The slightest irregularity mixing is provided at a nominal frequency of motor current. With greater or lesser frequency current uneven mixing increases.

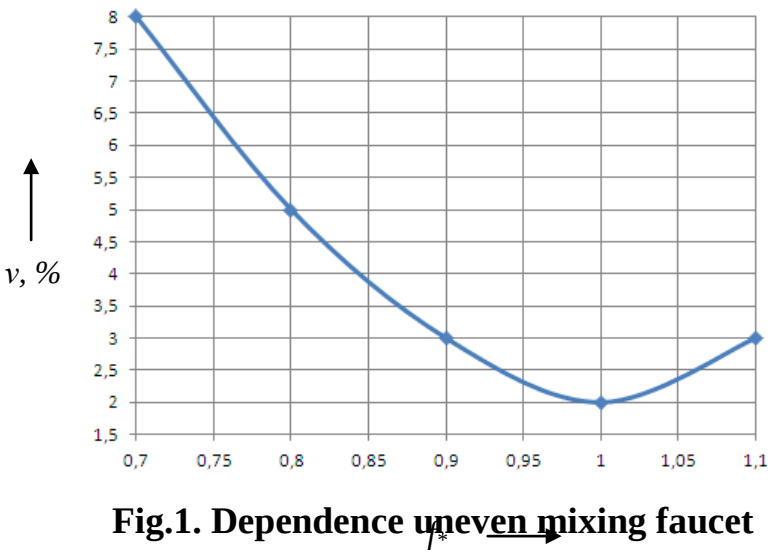

Fig.1. Dependence uneven mixing faucet C-12 feed of frequencies

Rejection frequency asynchronous electric current impact on power loss.

Specific electric mixer feed in relative units of kW • h / kg, calculated as follows:

$$q_* = \frac{1+\frac{1-\eta_н}{\eta_н}\cdot\frac{(\alpha f_*^{1,3}+f_*^{3})}{(\alpha+1)}}{Q_*\left(1+\frac{1-\eta_н}{\eta_н}\right)} = \eta_н + \frac{1-\eta_н}{\alpha+1}\left(\alpha f_*^{1,3}+1\right).$$

Thus, lower frequencies of the nominal value causes a decrease in specific consumption of electricity in the feed mixer, and its increase - increase (Fig. 2).

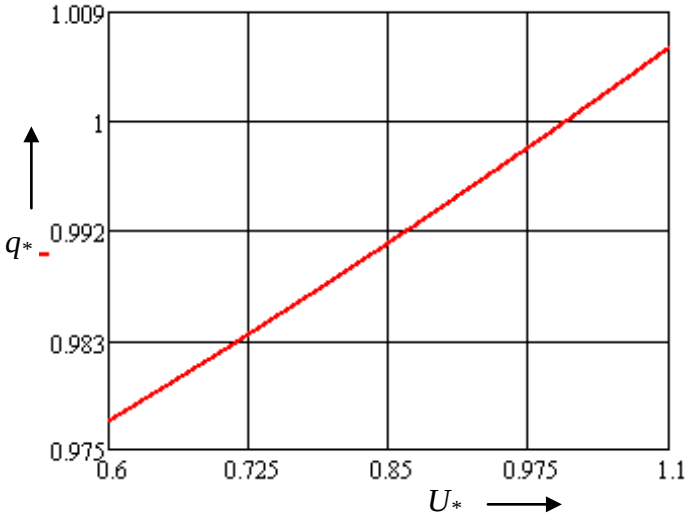

Fig. 2. Dependence of specific consumption of electric mixer feed from C-12 current frequency

Conclusions

In dismissing frequencies uneven mixing of feed increases. This change in relative power consumption does not exceed 4 %.