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UDK 621.31

QUALITY OF THE ELECTRIC POWER IN SYSTEMS OF POWER SUPPLY AND ITS CHARACTERISTICS

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Түйін

Мақалада электрмен қамтамасыз ету жүйесінде электр энергиясының сапасы мен оның сипаттамалары қарастырылған және параметрлер сезімталдығы талданған.

Резюме

В статье рассмотрены качество электроэнергии в системах электроснабжения и его характеристики, анализированы чувствительности параметров.

Keywords: asynchronous engines, frequency, electric power, parameters, tension.

Electricity or electric current call it is directed a moving stream of charged particles, for example electrons. Also the energy received as a result of such movement of charged particles, and lighting which is received on the basis of this energy is called as electricity. The term "electricity" was entered by the English scientist William Gilbert in 1600 in his composition "About a magnet, magnetic bodies and about a big magnite in Earth".

In general, since XIX century, the electricity is included densely into life of a modern civilization. The electricity is used not only for lighting, but also for information transfer (telegraph, phone, radio, television), and also for reduction of mechanisms in the movement (electric motor) that is actively used on transport (the tram, the subway, the trolleybus, an electric train) and in household appliances (the iron, the food processor, the washing machine, the dishwasher).

Quality of the electric power characterizes the electromagnetic environment of functioning of electric equipment, shows a measure of influence of system of power supply on it through the conductive electromagnetic hindrances extending on a network the casual influence capable to cause in the electrotechnical device functioning violation, refusal, destruction.

Asynchronous engines are intended for work at nominal rates of frequency and tension. Since creation in 1889 of the three-phase asynchronous engine by M. O. Dolivo-Dobrovolsky passed more than 110 years. During this time the theory of asynchronous cars substantially was already created thanks to works of many the scientists who are considered fairly one of founders of electromecanics: A. Geyland, Ch. Shteynmetza, F. Punga, E. Arnold, I. Lakur, K.A. Kruga, K.I. Shenfer, G. N. Petrov, M.P. Kostenko, B. P. Aparov, F.I Holuyanov, L.M. Piotrovsky, M. Lifshits, R. Richter, P. S. Sergeyeve, etc. In the last decades the new impulse to development of the theory of asynchronous engines was given by a wide circulation of computer facilities. The significant contribution at the present stage in development of scientific and pilot studies of asynchronous engines was brought Ivanov-Smolensk A.V., Kopylov I.P., Bespalov V. Ya., Efimenko E.I., F.A. Mamedov, Lopukhina E.M., Semenchukov G. A., etc. A large number of works is devoted to influence of deviations of parameters of a network on characteristics asynchronous engines: Tserazov A.L., Berger A.Y., Sinai M.M., Shchedrin O.P, etc.

Network parameters usually differ from passport data asynchronous engine, they are normalized by national and international standards. Technical - economic indicators, quality and stability of work asynchronous engines strongly depend on any their indignation. Electric motors are calculated on the certain deviations of parameters of a network stipulated by technical documentation. Real deviations can differ from them considerably. Parameters of a network differ in duration and nature of influence. It can be fatal, leading to emergency interruption of work asynchronous engines. Influence of a number of

factors doesn't cause shutdown asynchronous engine from a network, change only characteristics, is more often - for the worse.

Quality and stability of operation of asynchronous engines with a short-circuited rotor generally depend on sizes of tension and frequency of alternating current on its clips. The asynchronous electric motors attached to electric networks are intended for work at certain nominal rates of frequency and tension. Any indignation of these sizes directly influences technical and economic indicators of asynchronous engines.

The electric equipment connected to a network, on the one hand, reacts to electromagnetic hindrances in one way or another, on the other hand, itself can be a source of hindrances.

Distortions of parameters of a network are characterized by the following changes:

1. frequency deviation;
2. fluctuations of tension;
3. tension failures;
4. temporaryoverstrain;
5. tensionimpulses;
6. fluctuationsoftension.

Practically all parameters of a network - random variables. The accounting of random factors demands purpose of admissions as at the entrance sizes caused by parameters of an electric network and service conditions and on the output indicators of the car depending on them.

Apply some indicators of quality of the electric power characterizing the types of distortion of tension, and also their reason listed earlier to the characteristic of systems of power supply.

Frequency deviation

Frequency is the all-system parameter of the EES mode and is defined generally by balance of active power. Frequency of alternating current in electric system is defined by the frequency of rotation of generators of power plants. The nominal rate of frequency can be provided in the presence of a reserve of active power. In each timepoint in electric system equality between the power of generators of power plants and power consumed by loading taking into account losses of power in elements of an electric network has to be provided.

Fluctuations of tension

Fast changes of loading create fluctuations of tension. They are characterized by the modulation of the operating or amplitude values of tension caused by swing of fluctuations δU :

$$\delta U_t = \frac{|U_{t1} - U_{t2}|}{U_{ном}} \times 100\% \quad (1)$$

frequency of repetition of changes $f_{\delta U}$ by number of single changes in unit of time or an interval between changes by time $\Delta t_{\delta U}$ interval from the beginning of single change to its final value.

Tension failures

Treat failures of tension sudden considerable undervoltage which restoration of tension to the level, initial or close to it, through a period from several periods to several tens seconds follows.

Temporary overstrain

The temporary overstrain is an increase of tension in a point of an electric network higher of more than, arising in systems of power supply at the switching an overstrain can have periodic character and to be symmetric and asymmetrical.

Pulse tension

Pulse tension is caused by the storm phenomena, and also transition processes at the switching in system of power supply. In this regard distinguish storm and switching impulses of tension which significantly differ according to the characteristics and a form.

For the analysis of influence of quality of the electric power on characteristics asynchronous engine modern methods of multiple mathematical modeling are used:

- the analysis of sensitivity of output indicators asynchronous engine to change of input parameters;
- the statistical analysis of output characteristics asynchronous engines, including an assessment of laws of their distribution, maximum deviations, probabilities of hit in the set range.

Multiple mathematical models are connected with repeated calculation of characteristics of the car at deviations of input parameters. They are based on one-alternative models which allow to estimate deviations of the main output indicators asynchronous engines, as a rule, static. The efficiency, power factor, rated current, current and power of consumption in the idling mode, the starting moment and current, static reloading ability belong to such indicators. For more detailed research it is also useful to consider components of losses and some other indicators.

Influence of the listed parameters of the feeding tension on characteristics of asynchronous engines is widely lit in literature, a large number of works is devoted to its analysis. However in their considerable part influence of one or two factors is investigated, is frequent from the point of view of ensuring new functional properties of the car. To complex research of simultaneous influence of all factors it isn't paid sufficient attention.

Such analysis is especially important to a work asynchronous engines when it is necessary to be guided by the limited power of networks or by autonomous sources of the electric power.

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УДК.338.124.4 (574)

ECONOMIC CRISIS IN KAZAKHSTAN

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Түйін

Бұл мақалада Қазақстан Республикасының экономикалық дағдарысы, оның кезеңдері, сонымен қатар ел экономикасында болып жатқан келеңсіздіктердің орын алу себептері баяндалған.

Резюме

Данная статья раскрывает проблемы экономического кризиса в Республике Казахстане, его этапы, а также особенности возникновения данного положения в экономике страны.

Key words: functional crisis, world market, dangerous situation, system.

A crisis is any event that is, or is expected to lead to, an unstable and dangerous situation affecting an individual, group, community, or whole society. Crises are deemed to be negative changes in the security, economic, political, societal, or environmental affairs, especially when they occur abruptly, with little or no warning. More loosely, it is a term meaning "a testing time" or an "emergency event".[1]

Ways to manage a crisis

As aforementioned, a crisis can be overcome by implementing mechanisms such as: sleep, rejection, physical exercise, meditation and thinking. To assist individuals in regaining emotional equilibrium, intervention can be used. The overall goal of a crisis intervention is to get the individual back to a pre-crisis level of functioning or higher with the help of a social support group. As said by Judith Swan, there's a strong correlation between the client's emotional balance and the trust in their support system in helping them throughout their crisis. The steps of crisis intervention are: to assess the situation