

УДК 621.311.1

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POWER SUPPLY OF AN INDUSTRIAL ENTERPRISE

The power supply system is a complex production complex, all elements of which participate in a single production process.

Power supply factors include:

1. rapid flow of phenomena when the simultaneous generation of electricity and its consumption takes place;
2. a change in the power supply regime, which will lead to a deficit or excess of active and reactive power, and as a result – to a change in such parameters as voltage, frequency, load on the elements of the power supply system.

The use of the automation system in the power supply systems of industrial enterprises allows reducing the total number of accidents, preventing their development, reducing the time of shutdowns of electrical installations and downtime of mechanisms. Besides, a significant part of electrical installations of substations can be transferred to work without constant maintenance.

The purpose of this study is to analyze the most common and promising models and schemes for replacing the power supply system. A large amount of electrical equipment at lower levels depends on a single electrical apparatus at higher levels. The use of a model of the power supply system in the form of a finite state machine allows you to check the reliability of power supply to consumers, simplify the design of the power supply system of an industrial enterprise.

Power supply with alternating current with a frequency of 50 Hz is usually carried out from a three-phase industrial network of 110 kV through a step-down three-phase transformer. Power supply systems are displayed in the form of diagrams.

The indicators of the effectiveness of the system's functioning are reliability and fault tolerance. To simplify the analysis of the operation of the power supply scheme, we will divide them into levels: power source, switching devices and elements of electric energy transportation, power receivers. The main indicator of the effectiveness of the automated control system of the power supply of industrial enterprises in combination with the automation of substations is the improvement of the reliability and uninterrupted power supply of industrial enterprises, which contributes to the rhythmic work of enterprises, reducing the number of defective products, and improving its quality.

The main economic indicator of the effectiveness of the automatic power consumption management system is the reduction of electricity consumption due to the automated hourly and daily electricity accounting for each connection of commercial and technical accounting, the reduction of the cost of unmaintained substations, the optimal distribution of reactive power thanks to centralized operational management.

Electric energy is used by a wide variety of consumers: from industrial, smaller, but with a large capacity, to household, characterized by a small capacity, but very numerous, which are used both in the city and in the countryside. When supplying electricity, it is necessary to observe two main aspects. On the one hand, it is product quality (refers to technical parameters such as voltage amplitude, frequency, harmonic content and symmetry of three-phase systems), and on the other hand, service quality (refers to continuity of supply and refers to short/long interruptions and safety in supply).

Much of the equipment in use today, especially electronic devices and computers, requires a good PQ. However, due to its non-linearity, the same equipment often distorts the power supply voltage of installations, i.e. leads to the occurrence of a non-sinusoidal current when a sinusoidal voltage is supplied. Thus, maintaining a satisfactory quality of electricity is a joint responsibility of the supplier and consumer of electricity.