STEADY OF AUTOMATIC CONTROL SISTEMS

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ABSTRACT

This article is an automatic control system that serves to perform operations such as starting, stopping, changing the direction and speed of the technological machine, a technological parameter of the object (temperature, pressure, step height, speed, humidity). about systems that serve to adjust (stabilize) during the technological process or systems that change the technological parameters of facilities in accordance with a previously given law, the system of training to control the technological process.

Keywords: Automatic control, problems, process-induced, control systems, universality, parametrs, centrel problems, management, identification, quality assessment.

AUTOMATIC CONTROL THEORY is a branch of technical cybernetics that conducts research on the development of automatic control systems (ABT) of various complexity and nature. The theory of automatic control uses similar (adequate) mathematical models of real objects instead. It mainly deals with two problems: the analysis and synthesis of automatic control theory. The two types of control systems, open and closed control systems, differ in the way they manage processes. In the first, the control effects are derived from the process-induced effects and are aimed at reducing the difference in their wear. The main disadvantage of such a control system is that it cannot withstand unmeasurable external drag effects. In addition, these control systems cannot

control unstable objects for long periods of time. At the heart of closed management systems is the idea of feedback.[1] This idea is known as the parameter deviation control principle (or feedback control).

Here, execution signals are generated that return the control parameters to the required state due to deviations from the required level. The universality of this method is reflected in the management of unstable objects. The central problem in automatic control theory, especially in closed system theory, is the robustness of the system. The 1950s and 1960s were a period of rapid development of synthesis methods for such systems. The choice of quality criteria is the key to solving the problem of synthesis. Among the methods of synthesis of the theory of automatic control, the methods of invariant and autonomous synthesis of such systems have a special place. In this theory, the synthesis method of Automatic Control Theory based on the use of integral criteria of quality assessment is preferred. As expressed in the theory of automatic control, the synthesis of nonlinear objects bounded in the form of control inequality stimulated the emergence of partially modified methods for solving new problems of variation calculation, such as Pontryagin's maximum law and Bellman's dynamic programs. The synthesis methods of optimal systems have been generalized, and the theory of automatic control has been transferred to the class of distributed parametric control systems, where relatively little research has been done.[2]

In some control objects, the a priori of an invariant mathematical model is inadequate to the actual state of the object when developing or designing an automatic control theory. Often, due to the extreme complexity of the process, it is practically impossible to create a mathematical model of the control object based on certain physical or chemical laws. This is, of course, the result of external and internal deceleration parameters that cannot be measured when using Automatic Control Theory. Therefore, a scientific field called methods of identification of control objects has emerged. The advent of adaptive control systems has made it possible to fill a priori information gap and increase system efficiency. A simple closed-loop extreme adjustment system belonging to the class of adaptive control systems can be divided into a separate class, and such a control problem is considered a probability problem.[3] To solve it, statistical solutions and methods of controlled random process theory are used. Continuous (analog) and continuous (digital) modeling methods are of great importance in the stage of scientific and applied research on the development of the theory of automatic control.

The rapid development of cybernetics, the creation of computers that can process data at high speeds, and the

application in industry have created new technologies for data processing. Due to this, there are currently two:

1. Automatic control circuit (BAS)

2. The concept of automated control system is widely used in production automation.

BAS is a system of technical devices consisting of a controller and a controller that can ensure the passage of individual local technological processes on the basis of a given program without human intervention.

An automatic control system that serves to perform operations such as starting, stopping, changing the direction and speed of the technological machine, adjusting a technological parameter of the object (temperature, pressure, level, speed, humidity) during the technological process (stabilization) systems or systems that change the technological parameter of objects in accordance with a previously given law, local automatic systems that serve to perform technological process control, protection and signaling functions, etc. without human intervention.

BAS is a complex set of multi-level systems that involve the automation and control of data processing on a computer based on economic mathematical modeling and human intervention.

This system ensures that management solutions are sound and reasonable, that the management process is carried out with high efficiency and speed, and that the management facilitates the work of the unit.[4]

BAS is defined as a “human machine” system that automates the collection and processing of data needed to optimize management in various areas of human activity. Such a system performs the following three functions:

1. Collection and transmission of information about the controlled object.

2. Data processing and control signal generation.

3. Managing influence on the controlled object.

In BAS, the above functions are performed by a computer. The control function on the object is performed by the operator on the basis of information received from the control machines. That is why BAS is called “human machine system”.

Automated production management - the use of mathematical methods, automatic devices and computer tools in the management of various industries. Its scientific basis is economic cybernetics. Addressing methodological and specific issues related to the relationship between man and cyber machines is an important task for him.

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