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AUTOMATION OF TECHNOLOGICAL PROCESSES

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Abstract:

At the present stage of human development, systems for automating production processes are based on the use of computers and various software. They help to reduce the level of people's participation in activities or completely exclude it. The tasks of automating production processes include improving the quality of operations, reducing the time they require, reducing costs, increasing the accuracy and stability of actions. This article will provide feedback and feedback on the automation of technological processes and the use of new digital technologies during the management of these processes.

Keywords: technologies, automated system, production, modernization, technological processes, operations.

Today, automation of production processes is introduced in many areas. Almost every company uses software devices, regardless of the scale and size of the companies ' activities. There are different levels of automation of production processes. However, the same principles apply to any of them. They provide conditions for the effective execution of operations and form the general rules for their management. The principles of carrying out automation of production processes include:

1. All actions within the operation must be combined with each other, go in a certain sequence. In case of incompatibility, there is a possibility of a violation of the process.
2. Automated operation should correspond to the general environment of the enterprise. At one stage or another, integration is carried out in different ways, but the essence of this principle is invariable. Automation of production processes at enterprises should ensure the interaction of the operation with the external environment.
3. Automated operation should be carried out independently. Human participation in it is not provided, or it must be minimal (control only). If it is carried out in accordance with the established requirements, the employee should not interfere with the operation.
4. These principles are determined in accordance with the degree of automation of a particular process. For operations, additional proportions, specialties, etc.

It should be noted that the automation of production processes is complex and labor-intensive. To achieve your goals, you need to follow a certain strategy. This will help improve the quality of the operations performed and get the desired results from the activity. In Mechanical Engineering, competent automation of production processes is of particular importance today.

The project consists of a complex of technical documentation, which includes entries that fundamentally substantiate the need for the construction or reconstruction of an object, calculations and drawings necessary for the preparation of non-standard equipment, as well as for the implementation of all types of construction and installation and adjustment work. Depending on the complexity of the object under construction, the project will consist of certain parts. The project can include such parts as technical-economic, technological, construction, plumbing, electrical, automation. Control and automatic adjustment of technological processes, which is a branch of the automation project, and the control part is carried out by an Automation unit (group) of a specialized organization or technological design institute in this area. This project includes control measuring instruments, regulators, automation and signaling devices, technical documentation used in the design facility, ensuring the rational operation of technological processes and safety in the work of equipment.

When performing the design, the basis is the organization that makes up the technological part of the project and or the task assigned by the customer. At some point, an organization that performs an automation project is also involved in drawing up an assignment. Design tasks include:

a) the composition of the object being designed, a brief description of the technological process, a characteristic of the device and equipment;

b) the result of controlled and adjusted magnitudes with the indication of the characteristic of the environment;

c) fixed errors in control and adjustment and functional signs of tools.

The design of control, automatic adjustment and control systems can be carried out according to special instructions.

At the design stage of production process automation systems, technological objects of management should be analyzed in detail. In this case, it is necessary to have an analysis system, conduct research in terms of technical equipment of the production process and organization of technology, quality of raw materials and finished products, process management. In the process of analysis, the technological processes of specific production are studied, the quantities that represent the process are determined, the interconnection between them is found.

When designing automation systems of technological processes using computing machines, as well as when automating objects that have not been newly modified, or have been used in production with very complex technology, or new equipment, research and examination or experimental design work is carried out before the above design stages, the results of which are used when drawing up a project.

In the process of creating a technical project, it is necessary to substantiate the choice of the size, basis of compilation of automation systems and complexes of technical means that carry them out, as well as determine the estimated prices of automation systems. In addition, at the stages of the technical project, issues of compliance with the conditions of automation of technological processes and basic technological equipment are considered and, if necessary, measures are established for their modernization or reconstruction in order to create conditions suitable for automation.

When creating working drawings, the tasks of a technical project are determined and detailed, which are sufficient for the preparation of shchit and remotes, the selection of automation tools and tools, and the implementation of the order, as well as construction and installation work. Automation systems should make it possible to increase the working drawings and also cover the use of blocks prepared outside the assembly area. In order to improve the quality of project documentation, reduce their size and duration in the design of systems for the automation of technological processes, it is necessary to build on instructive and regulatory materials that embody advanced industrial experience in the field of automation, as well as to use regulatory materials of a universal and sectoral nature. When creating projects of systems for the automation of technological processes, it is necessary to make the most of typographic projects, solutions, constructions, etc.

The principle scheme of automation is the main technical document of the project, which indicates the degree and principle of automation of the technological device. In this, all the principled solutions adopted at the initial stage of constructing the control system find their expression. The drawing should give an idea of the control object, the means used in control, adjustment, program control, signaling, blocking, protection and automation. Usually alarm, blocking and protection are extended in special drawings. In principle drawings, along with control bodies and communications, a drawing of a technological device, automation tools, schematically shows the interconnections between various devices of technological units and automation tools.

IN CONCLUSION, automation issues are solved using technological tools, which include selected devices, primary information determinants, means of replacing and processing information, means of introducing and extracting information to service personnel, and auxiliary tools. Two methods of marking automation tools and tools and conditional signs are recommended: automation tools and tools, which carry out complex tasks, for example, control, adjustment and signals, in a simplified and detailed extended markup style, and worked in the form of some blocks, are represented by one conditional sign. Devices performing auxiliary tasks are not described.

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