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AUTOMATION OF TECHNOLOGICAL PROCESSES

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Annotation:
This article is devoted to the automation of technological processes, in which the history of the development of this process, its importance in our lives.

Keywords: Radio parts, electronic lamps, ion instruments, electron-beam tubes, transistors, mounting wires, radio-electronic devices

Introduction

Production automation - assignment of control and management of mechanized production to automatic devices; high stage of mechanization of production. One of the main directions in the development of science and technology. Labour productivity, product quality, work culture and other factors allow to increase the level of production. There are stages of partial (local), general (complex) and full automation of production. At the stage of partial automation, the adjustment of certain types of production operations (fluid level, temperature, pressure, etc.) will be automated. In the general automation phase, several types of partially automated work are interconnected at the department, shop, and enterprise level, and are controlled by a specific program as a single automated complex. Control is carried out under the supervision of a person (operator). At the stage of full automation, the stability of the production process and the constant change of types of work ensure high efficiency. It is appropriate to use full automation in hazardous production conditions.

Some of the tools of automation are ancient. However, in the context of small crafts (until the 18th century), such devices were not used in practice. As a result of the improvement of tools and equipment and the creation of new machines and mechanisms (19th century), the volume and level of production changed dramatically. This created the necessary conditions for mechanization of production (for example, in spinning, weaving, metal and woodworking). After the invention of the voltage regulator in the early twentieth century, it was used in the production of electricity; multi-operating machines and automatic lines. The concept of production emerged during this period.

The development of automated control devices and production processes began at the same time as the construction of heavy industry and machine building (1930s). In the heavy, light and food industries, automated devices have been used, and automation of transport has been improved. Automation

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laboratories have been established in the institutes of energy, metallurgy, chemistry, mechanical engineering, utilities, and IT. By the 1950s, automation began to be used in almost all sectors of the economy. Hydroelectric power plants have been fully automated, water supply systems and other areas have been automated. The scientific basis of production has developed in three main directions. First, effective methods have been developed to study the laws, dynamics, stability, and influence of external factors on the objects of governance. These issues are solved jointly by researchers, designers, technologists. Second, the effectiveness of management methods, the purpose of the management function was determined. On this basis, the rules of management decision-making have been established. Third, detailed, simple, and efficient engineering methods have been developed to harmonize the design of automation tools that perform measurement, processing, and control functions. However, work on improving and developing production automation will continue. In shops, warehouses and other places of production, the compilation and initial processing of information is carried out by means of keyboard devices, the collected information is transmitted for processing. Sensors are used to automatically record information. Data transmission tools include signal converters, telemechanics equipment, signal distribution switches, and more. Logical and mathematical information processing devices include functional modifiers that change the nature and shape of signals, devices that process information according to a given algorithm (including computers), and more. Includes devices that display information (including computers) and more. Information display devices - signal board, mnemonic circuits, national and digital devices, electron-beam tube, letter and digital printing machines show the operator the progress of production processes and record important parameters. Devices that generate control effects convert weak information signals into strong impulses. These impulses act on the executive body of the protection, adjustment, or control devices. A set of tools for data collection and processing allows to automate the management of economic sectors. Control and adjustment equipment, analytical equipment and software control systems, which allow to carry out production in an optimal mode, are also very important in the automation of production process management. For example, in hydroelectric power plants, water from the reservoir flows continuously through hydraulic turbines. Automatic regulators adjust the number of revolutions of the turbines, the frequency and voltage of the current produced, the active (active) and reactive powers. Protective devices prevent accidents. The auto operator starts and stops the units according to the schedule. The power system dispatcher uses a telemechanic device to control the HPP remotely (from the central remote control). Almost all hydropower plants in Uzbekistan work in this way.

Thermal power plants are much more difficult to manage. The "boiler-turbine-generator-transformer" block with a capacity of several hundred MW (Megawatts) consists of various units. For example, a block with a capacity of 800 MW has about 1,000 control objects and about 1,300 controlled parameters. Using an automatic control system, these objects and parameters are controlled by a single engineer-operator.

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Chemicals, petrochemicals, gas and pharmaceutical industries, water supply, sewerage and others can be automated. In addition to improving mining methods, thermal, electrical, and acoustic methods are being developed to effectively automate the process; the mines use computers.

Processing of minerals in metallurgy is carried out mainly in a cyclical manner. During blast furnace production, all basic parameters are automatically measured and adjusted. Thermal control system uses computers and computers. In open-hearth furnaces, gas consumption is automatically adjusted.

The main drive, tensioning gear drives and auxiliary mechanisms are automated on rolling mills. Computational cutting systems are used without the use of computers. In modern machine building, it is the basis of technical progress. Along with automatic lathes, multi-operational units, hydraulic, pneumatic, electric or mixed control systems have been developed and are being improved. The versatility of machine tools is maintained even when the work cycle of programmable metalworking machines is fully automated. Automation of assembly processes is one of the most complex and topical issues in mechanical engineering. It provides great economic benefits. The quality of the assembled components and items is automatically checked during assembly. For example, at the Tashkent Agricultural Machinery Plant, spindles are made on an automatic line, and cotton picking machines are assembled on automatic conveyors.

In the light industry, automated devices and automated enterprise management systems have been introduced and are being implemented. The footwear, haberdashery and other industries are equipped with high-efficiency automatic devices for mass production. Automated production management is also important in catering. Automatic processing of products (wiping, cutting, grinding, etc.) fully preserves the nutrients and flavour of the ingredients, significantly reducing waste.

Mass automation has also been introduced in the cotton industry. They have complex automation of processes from receiving cotton to sorting filament, seeds and down and spinning the fibber.

The growth of freight and passenger traffic is due to the expansion of all modes of transport and the acceleration of traffic on existing routes. Automation of the operation of freight transport will allow to strictly follow the train schedules and ensure traffic safety. The trains are operated using a “motorist”. Much of the work on cargo and passenger ships is automated. The planes are being piloted using autopilot. Exposure, computers are a great help to man in this area.

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.

In addition to computers, dozens of specialized automatic devices and computers are used in the automatic control of production. Automated production management frees one of the laborious tasks of data collection and processing, increases its creative role, increases productivity, and allows the use of people involved in production management for other purposes.

In short, the role of automation in the life of all mankind is invaluable. Proper organization of process automation and control systems requires precise calculations and determination of optimal control parameters. In order to do this, it is necessary to know the correct structure and systematic analysis of

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automation and control systems. As a result, all their work is done with ease and without any difficulty, using the power of technology.

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