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SPECIALTY OF TECHNOLOGICAL PROCESSES AND PRODUCTION AUTOMATION – PROFESSION OF THE XXI CENTURY

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Abstract

The article summarizes on a scientific basis the importance of automation in the process of historical development and improvement of technological processes and the basic requirements for the specialty "Automation of technological processes and production".

Keywords: automation, energy, materials, product modification, manufacturing, design, planning, management, research, optimization, sensors, actuators, standards.

Some automation tools are ancient. But in the conditions of small crafts (until the XVIII century) such devices were not used in practice. As a result of the improvement of tools and equipment, the creation of new machines and mechanisms (until the XIX century), the volume and level of production changed dramatically. This created the necessary conditions for mechanization of production (for example, in spinning, weaving, as well as in metal and wood production). In the early twentieth century, a voltage regulator was used in the production of electricity after its invention; multifunctional machines and automatic lines were created. The concept of production automation was born during this period. Over the centuries, humanity has always moved forward. By the 21st century, we are creating new and multifaceted tools that increase the effectiveness of everyone's efforts. The next step, which is being actively pursued today in a broad sense, is automation [1].

Automation is a self-governing technical means to significantly reduce the level of human participation in the reception or transmission of data, energy, materials, products, modification, transportation and use, as well as to increase labor efficiency and is one of the areas of scientific and technological development that uses mathematical methods.

Accordingly:

- production processes;
- designing;

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- organization, planning and management;
- scientific research;
- training;
- business processes;
- And other areas of human activity will be automated.

Automation allows to increase labor productivity, improve product quality, optimize management processes and exclude people from areas that are dangerous to health. Automation requires a holistic, systematic approach to problem solving, except in the simplest cases. Automation systems include sensors, input devices, control devices (controllers), actuators, output devices, computers. Sometimes used computational methods copy from a person's nervous and mental functions. These toolkits are commonly referred to as systems.

In the age of automation and mechanization, technical education is becoming increasingly important. Manufacturers and scientists in Western countries realized the need for engineering specialists as early as the seventeenth century. This was primarily due to the construction of roads and bridges of military significance [2].

At present, the pace of development in all spheres of human activity is accelerating. In the context of small production, enterprises are increasingly showing themselves. Strong competition is forcing them to reorganize to produce new products in line with market requirements in a short time and at minimal cost. The production automation program has become a reliable tool, leading not only to the adaptation of enterprises to new socio-economic conditions, but also to many technological advantages that allow a significant reduction in the value added of products. In addition, the automation of production processes helps to perform many technological operations that previously could not be achieved by humans. Thus, the introduction of automation contributes to the overall technological development of society [3].

Automation is a technological process that no business can bypass. Automation serves to simplify process management, reduce product costs and facilitate labor in the enterprise. Process automation does not stop at one place, they are always refined and improved. Further development and improvement of technological processes is associated with the creation of high-capacity stations equipped with modern equipment. In this regard, the

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requirements for their reliability are increasing, which leads to an increase in the requirements for the calculation, production and use of equipment. Modern devices must work reliably for a long time under optimal intensive operating conditions. These problems can be solved only if the technology and equipment are improved. Therefore, the specialty "Technological processes and automation of production (by industry)" is one of the most in-demand professions. The graduate qualification will be technical. The graduate of this specialty must be ready for professional activity in the organization and implementation of work on the installation, repair, maintenance of equipment and devices for measuring, monitoring, testing and regulation of technological processes.

In modern enterprises, specialists with this level of knowledge can work as technicians, but they need to know: the design and structure of technological departments; the rights and obligations of the designer and technologist; standards, duties and rights of engineering and technical workers, the volume of work performed in workshops, departments, etc., operation, repair and adjustment of automation equipment, development and execution of simple design and technological documentation; use of computers in design; maintenance of automation systems; performance of functional duties of repetitive engineering and technical workers of laboratory and others.

A distinctive feature of this profession is to ensure the optimal operation of technological processes and automated production control systems. Objects of professional activity include technological, transport, information and other production processes. Trained as a direct organizer of the production process in the technical brigade, shift, workshop for the operation of automated control systems. He must have the skills to weld, design and read documentation, be familiar with and use measuring techniques, and be able to calculate the parameters of various electrical circuits. The technician must organize the work of the production site in accordance with safety regulations [3].

The main activities of the technician: production and technological activities - installation, commissioning, adjustment of automatic control systems; conducting standard and certificate tests, metrological inspection of measuring instruments; analysis of the causes of failure of automatic control systems, their devices and functional units and development of measures to

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eliminate failures; control and analysis of the operation of automatic control systems, their devices, functional blocks, measuring instruments; maintenance of automatic control systems; adjustment and maintenance of microprocessor technology, hardware and software of automatic control systems [4].

The specialist on the basic requirements for professional training should have an idea of: the main scientific and technical problems and prospects for the development of technological processes and production automation, their relationship with related industries; on the development trends of technological machines, the structure of flexible technological complexes, integrated and automated production; on the basic principles of construction of automated technological processes and control computer systems for production; on indicators of quality and reliability of elements of automated technological equipment [5,6].

In the context of the dynamics of market relations, a vocational education graduate may not have a guaranteed job not only for the long-term, but also in the near future.

There is currently a shortage of highly qualified specialists in the field of production automation. Therefore, a specialist in the automation of production and technological processes is in demand both in mechanical engineering and in various enterprises with automated production control systems [7-10].

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