

Original Research Article

Application Analysis of Electrical Automation in Electromechanical Engineering

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Abstract: With the progress of society and the development of science and technology, China's electrical automation technology has continuously overcome difficulties and made great progress. Electrical automation plays an important role in electromechanical engineering and is widely used. At present, remote control and management of the system are especially needed, which can be achieved by electrical automation. At the same time, electrical automation can also improve the working efficiency of equipment and effectively guarantee the safety of the project. This paper analyzes the application and development of electrical automation.

Keywords: Electrical Automation; Electromechanical Engineering; Application

1. Introduction

Electromechanical engineering is the general name of mechanical and electrical engineering. Since the 21st century, China has made great progress in electromechanical engineering, among which electrical automation is an important part, which is widely used in industry, agriculture, national defense and other fields, and plays an increasingly important role in China's economy. Electrical automation technology involves all walks of life, from designing switches to manufacturing rockets. Electrical automation equipment plays an important role in all walks of life.

2. Brief description of electrical automation

Electrical automation, i.e. electrical engineering and automation, is a new subject in the field of current electrical information. Based on control theory and power grid theory, power electronics technology and

computer technology are the main technical means, covering the research fields of system analysis, system design and system development, i.e. system management and decision-making. In recent years, China's power electronic technology has developed rapidly, which has led to the development of electrical automation. The wide application of electrical automation improves the production efficiency of related enterprises, liberates and develops productivity, and at the same time ensures the safety of some projects. Compared with the traditional production equipment, the electrokinetic equipment has a qualitative improvement, and it is no longer necessary to combine multiple accessories for production. The automatic control function can ensure the efficient operation of the equipment. The greatest advantage of electrical automation in electromechanical engineering is that it can remotely control and manage the selection system of electromechanical equipment and monitor it in real time. There are many commonly used electromechanical equipment, such as transformers and

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generators. This kind of equipment needs to be monitored the parameters in real time, and analyzed and predicted these parameters. This can effectively improve work efficiency, because while monitoring these data, the system can find out existing problems, reduce manpower consumption, liberate and develop productivity, and improve social labor efficiency. Application of electrical automation in electromechanical engineering.

3. Application of electrical automation in power grid dispatching and mechanical equipment

Automation system is the most important point of electrical automation in power grid dispatching. This automation system is composed of software and hardware. Computer network system is the "software" of automation system, and hardware is the operating system of central server and workstation. The main feature of electromechanical automation application mentioned above is that it can monitor the system in real time. Operators can improve work efficiency and control the equipment better by monitoring the electromechanical equipment.

3.1 Widely used in power plants, hydropower plants and thermal power plants

With the progress and development of society, automation technology has been able to carry out real-time monitoring in hierarchical distribution, which is called decentralized measurement and control system in electrical automation. This system is a system that can reflect the function of electrical automation in power plants. Because of the convenience of electrical automation, workers can remotely control and manage electromechanical equipment through Ethernet, which greatly improves the working efficiency of workers and relieves the working pressure. The staff can analyze and predict the data generated by the equipment, and know the working condition of the equipment in time. In hydropower plants, electrical automation equipment can effectively ensure the production efficiency and ensure the stability and safety of power generation and supply. It plays a more important role in thermal power plants,

which can integrate electricity, engine and boiler, and enable thermal power plants to realize integrated operation. The staff can monitor the parameter data generated by the equipment background information in real time, find and solve the problems caused by the equipment in time, effectively reduce the maintenance cost of the enterprise and improve the production efficiency.

3.2 The application of integrated automation technology

In electromechanical automation technology, integrated automation technology, as another important automation technology, aims at different production and operation days and projects with different technical functions, and develops these different days in an integrated way. In the traditional mechanical equipment manufacturing, no matter the mechanical design, assembly, manufacture and maintenance, it needs a lot of labor to complete, which makes it difficult to realize the integration of mechanical manufacturing technology. However, with the rapid development of information technology and science and technology, the mechanical manufacturing technology can be integrated, and the integrated automation technology can be applied to the field of construction machinery manufacturing. For example, under the background of market economic system reform, the competitiveness of machinery manufacturing industry has been continuously strengthened. In order to ensure the market competitiveness of their own enterprises, more and more construction machinery manufacturing enterprises are also trying new reforms. To further improve the quality of products and expand the market area of products has become the most concerned issue for all construction machinery manufacturing enterprises, and integrated automatic technology will become the breakthrough point for all major enterprises. In the process of construction machinery manufacturing, the organic combination of computer aided design technology, numerical control teaching technology, microelectronics technology and other technologies is used to carry out machinery manufacturing operation, which is reflected in the computer modern integrated manufacturing system engineering, and then the computer modern integrated manufacturing system is introduced into the machinery

manufacturing production system of enterprises, so that the construction machinery manufacturing system can be more perfect, thus replacing the traditional mechanical manufacturing which requires manual operation. Introducing integrated automation technology into construction machinery manufacturing of enterprises can improve the efficiency and quality of construction machinery manufacturing products to a certain height as a whole, which is a strong technical guarantee and support for construction machinery manufacturing enterprises.

3.3 Applied to the construction industry

In recent years, with the rapid development of computer technology and Internet of things technology, intelligent buildings have emerged, and electrical automation is the core key of intelligent buildings. The combination of automation of electrical automation and information technology improves the intelligence of high-rise buildings, ensures the safety of construction workers, improves building efficiency and effectively shortens the construction period. For example, in a building, metal equipment needs to be installed. The electrical automation technology can monitor the whole installation process comprehensively, design the program by using the electrical automation technology, and remotely control the system, so that the equipment can realize automation. Digital switch system is an important product of electrical automation technology and the core of construction and installation industry. The construction industry is developing towards intelligence because of its high efficiency and convenience. In mechanical and electrical engineering, mechanical and electrical equipment using electrical automation technology can effectively avoid accidents such as electric shock and leakage, and create a safer working environment. In mechanical and electrical engineering, automation technology improves system management level, collects information and sends it to the background to realize data exchange, which greatly improves efficiency.

4. The development direction of electrical automation in engineering

In actual development, having a unified and open platform is the key to the development of electrical

automation in China. First of all, IEC1131 standard, which can optimize the management program, improve the operation efficiency of the platform, reduce the programming time, shorten the upgrade cycle, has extremely high application value. With a unified platform, the language grammar can be unified and standardized, thus achieving the unification of product programming specifications and further ensuring the qualified rate of automation systems. Secondly, the computer controls the industrial control standard. In daily life, enterprises use PC system, which is flexible and can be used openly to achieve the ultimate application of the platform. Openness is an important development direction of electrical automation, and docking and exchanging technology with outside can make enterprises further develop. Electrical automation technology can realize remote control system and make equipment run normally. Unify the control platform of automation system, so that it can realize project cycle design, equipment operation and post-production test independently. The running code can be independently developed and uploaded to the equipment according to the different needs of customers.

Innovation of products is an inevitable trend of electrical automation production in China. Recently, our country's electrical automation production is to carry out the production according to the established plan of our country, and on this basis, realize the ability of strengthening original and integrated innovation. In this process, China's automated production has been continuously studied, and at the same time, the ability of re-innovation has been improved. The technological content of electrical products has also been continuously improved and it is more unique with Chinese characteristics. The development space of electrical automation in China is still very broad, and the independent innovation of electrical products is the core key to further development. Relevant enterprises should clarify the important position of technological innovation, constantly improve and improve the enterprise management and control system, and promote electricity

Continuous innovation and development of automation technology. The country has relevant political systems and research awards, and the efforts and innovations of various enterprises will create a good

policy environment for our country, thus promoting the progress and development of electrical automation technology in our country and making more breakthroughs in electromechanical engineering. Nowadays, the automatic production of low-end electrical products in China has been gradually improved, and high-level products need enterprises to promote independent innovation, so as to promote the continuous development of mechanical and electrical engineering, the continuous progress of electrical automation and strengthen the comprehensive national strength.

With the development of science and technology, in the future, the electrical automation system will be unified in structure and generalized, which will significantly improve the operational efficiency of actual automation equipment. Whether it is the development of the enterprise or the regional control, the universality of the network structure has an efficient function, which enables the management personnel to realize remote supervision and online command management. The current problem is how to realize data sharing at different levels. This requires the effective combination of network technology and electromechanical equipment, so as to achieve the goal of improving system efficiency. Generalization of electromechanical system structure is of great significance to ease communication barriers and ensure information exchange between different systems. For electromechanical engineering, the generalization of electromechanical system can greatly improve work efficiency, reduce costs and increase profits. In order to promote the efficient operation of electromechanical equipment, electromechanical engineering will inevitably enter centralized monitoring in the future. First, mechanical and electrical equipment will be centralized and monitored, which can maximize the use of centralized monitoring technology

The advantages of centralized management can find problems and correct them in time, and repair machine failures in time. Second, it is necessary to manage the equipment throughout the whole process, strengthen the functions of the central monitoring system, and expand its monitoring scope, so that it has the ability to control the overall situation, find accidents in time, find mechanical failures in time and give emergency notification in time. PC platform is very important for

automation system, while Microsoft's standards and technologies are Windowsxp, OPC, *etc.* PC is the key when connecting systems between enterprises. The operating system uses Windows XP to complete the communication at work, so that the standard interface of the automation system can be established. The establishment of standard interface of automation system ensures the exchange of data and information among enterprises and solves the communication problem at the same time.

5. Conclusion

Electrical automation is very important in electromechanical engineering, and the working efficiency of electromechanical engineering is greatly improved because of electrical automation. With the continuous improvement of electrical automation technology, the overall development of electromechanical engineering has also been driven, so electromechanical engineering has also stepped into the field of intelligence. Although China's electrical automation technology has made some progress, there are still some technical and management problems. Staff should continue to actively study and innovate at the beginning, so that electrical automation can continue to develop in the direction of openness, unification, innovation and high efficiency. At present, electrical automation technology greatly improves the working efficiency of electromechanical equipment and reduces the cost of enterprise development. In engineering, automation technology and equipment not only reduce the workload of workers, but also ensure the safety of engineering. The degree of modernization in China can also be reflected by the level of electrical automation technology. China should continue to strengthen the research on automation technology, improve the management technology in practice, and continue to contribute to enhancing the overall strength of the country.

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