Electrical Automation Control Technology of Electromechanical Equipment Based on Artificial Intelligence Technology

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Abstract: The economic take-off reflects the improvement of productivity, while the leap in productivity reflects the application of high-end science and technology Artificial intelligence become a hot topic in recent years, artificial intelligence technology is gradually applied to all walks of life, the electrical industry is no exception, the artificial intelligence technology and mechanical and electrical equipment electrical automation control work together, is helpful in improving the production efficiency, this article is based on artificial intelligence technology in electrical automation control technology application in the work.

1. Introduction

1.1 Concept of Artificial Intelligence Technology

Scientific researchers put forward the concept of artificial intelligence based on the working principle of human brain and combined with current science and technology, which is mainly reflected in the general directions of perception, processing and execution [1].Its working principle is based on computer, development of humanization of the operating system, using computer calculation ability, combining the discipline knowledge, digital processing, the phenomenon of things in the process reflects the highly intelligent, can greatly improve the efficiency of the operation of the electrical and mechanical equipment, the whole work process logic exactly corresponds to the human brain work.

In recent years, with the progress of big data, processor, chip technology, artificial intelligence has also made great progress, the application scenario is also more and more extensive. Electrical automation is also an important content in current industrial production. The application of electrical automation can be seen in everything from space shuttle to a switch, which plays an irreplaceable role in improving productivity. The combination of the two will inevitably bring further improvement in industrial production efficiency.

1.2 Development Status of Electrical Automation

Electrical automatic control system refers to the technology that realizes the control of time and sequence by designing electronic components such as relays and inductors in accordance with preset degrees or expected rules in the case of unmanned operation. At present, electrical automation control has been widely applied in the production field of our country, which is of great help to improve the production efficiency of enterprises. It can not only help enterprises to save a lot of labor costs, but also improve the production form of enterprises, making outstanding contributions to the overall development of enterprises.

1.3 The Advantages of Artificial Intelligence Technology

(1) High cost performance. Artificial intelligence technology is characterized by the use of computers to replace human resources. In electrical automation, a lot of information processing and operation are performed by human resources. The efficiency of judgment and execution varies from person to person, and the cost of human resources is relatively high. The artificial intelligence

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technology combined with electrical automation control can improve the efficiency of management, on the one hand, in terms of data collection and transmission communications, artificial intelligence technology can offer efficient and accurate data reference for electrical system, at the same time in terms of processing, artificial intelligence processing speed faster, so no matter from the processing efficiency or the human cost, artificial intelligence is very high cost performance.

(2) Flexible operation. In the traditional working mode, the electrical automatic control technology is not completely “automatic” and needs to be set artificially. Only when the equipment is in the state of preparation for a long time and there are corresponding trigger conditions can the “automatic” response be realized. The application scenario has certain limitations, small operation space and high design difficulty. Artificial intelligence technology has the logical analysis ability similar to human brain. The application of artificial intelligence technology to electrical automation control can greatly improve the operation efficiency of electromechanical equipment. At the same time, the operation accuracy will also be greatly improved through the continuous improvement of data statistics in the operation of equipment. By combining manual technology to build an open digital operation platform, equipment operation can be set by operating code, which can greatly increase equipment utilization rate.

(3) Stable and safe operation. Combination of artificial intelligence and electrical automation process, you can better use the Internet and computer technology to build more intelligent control system, digital system by improving the scientific level, can effectively improve the overall electrical equipment system stability, improve the control precision, so as to guarantee safe and stable operation of the system as a whole.

2. Development Demand of Electrical Automation Control for Electromechanical Equipment

With the increase of social demand, people also put forward new requirements for the improvement of productivity, electrical automatic control of mechanical and electrical equipment The system is unstoppable. The emergence of artificial intelligence will further expand the advantages of electrical automation transformation of electromechanical equipment [2].

2.1 Improve Production Efficiency and Economic Benefits

Of mechanical and electrical equipment automation control to the work of a computer instead of the previous human work, to reduce costs at the same time, realize the real-time monitoring of running status of mechanical and electrical equipment, and artificial intelligence can grasp in the whole process of the implementation of equipment operation efficiency, avoid the failures at the same time to provide technical support to improve efficiency.

Combined with artificial intelligence to carry out automatic transformation of mechanical and electrical equipment, from the overall performance of the mechanical and electrical equipment optimization, improve production efficiency at the same time reduce the operating cost of equipment, and ultimately provide help for the improvement of economic benefits of enterprises.

2.2 Promote Enterprises to Achieve Sustainable Development

Green development, sustainable development has been a hot topic in today's society, the emergence of artificial intelligence for the mechanical and electrical equipment of electrical automation control injected new momentum, can make the intelligent degree and the informationization level of mechanical and electrical equipment qualitative change, fundamentally improve enterprise productivity, improve the control level of refinement, implement mechanical and electrical equipment of low consumption, high power, achieve energy conservation and emissions reduction, authors efficiency, promote the sustainable development of the enterprise.

3. Application of Artificial Intelligence Technology in Electrical Automation Control System of Mechanical and Electrical Equipment

3.1 Improve Overall Monitoring Efficiency

In the production process, the equipment and circuit in the electrical automation system are linked together, and the stable operation of each link is the premise of the overall stable operation of the system. Therefore, it is particularly necessary to monitor the electromechanical equipment and power system in real time. The traditional monitoring work is generally performed by people, with relatively low timeliness and advance quantity. Combines artificial intelligence applied to the monitoring system, the system of remote monitoring function, advance the data information of the abnormal state of the set, use the equipment instead of the person to achieve all-weather monitoring precision, when there is abnormal data can alert in advance, greatly improve the efficiency of monitoring, achieve the goal of prevent or reduce accident loss accident [2].

3.2 Optimize the Central Control System

The working efficiency of the central control system is the guarantee of the working efficiency of the whole electromechanical equipment system. The application of artificial intelligence technology can greatly improve the intelligent level of the central control system[3] , improve the operation efficiency of the central control system, and thus promote the improvement of the overall efficiency of the working system. In the production process, the running state of each link will affect the overall production effect of the system. It is not only necessary to have accurate monitoring for each link, but also a powerful central control system for overall efficient control and adjustment. At present, the production system of most enterprises is not completely perfect, and the application of artificial intelligence can realize the overall improvement through the optimization of the central control system. The implementation process of specific measures is divided into several steps. The first step is to build a complete technical platform, make full use of big data and cloud computing technology to upgrade the central control system and move the process Line data and response plan are typed into the system in the form of code to realize real-time control of the operation and status of the whole process of the production line. Applied to control electric equipment, electric system and the structure of the electrical equipment is very complex, and the control system for the electrical equipment is difficult, but combined with the artificial intelligence technology, data integrating past operation can be make a high performance computer learning analysis, when the data sample size is large enough and then by modifying the parameters and indicators in the form of testing the running result of the artificial intelligence system, the memory bank of artificial intelligence in the process of work constantly self-improvement, eventually run efficiency will be more and more is also high.

3.3 Fine Management of Mechanical and Electrical Equipment

In order to ensure the overall production efficiency, some factories and enterprises have a complex electrical automation control system[4] . Each step in the system operation process must be carried out in strict accordance with the requirements and regulations of automation operation, so as to ensure the maximum function. The application of artificial intelligence technology can simplify the original complex automatic control program, thus improving the control effect of automatic electromechanical equipment. In the current production work, a lot of factory operating costs are in the aspect of power consumption. The use of artificial intelligence technology can carry out a detailed analysis of the work process, so as to find the direction and method of cost control.

3.4 Realize the Overall Intelligent Control

The purpose of electrical automatic control system design is to improve the efficiency and stability of production while ensuring the safety of production, which is exactly in line with the design idea of artificial intelligence. At present, the application types of artificial intelligence in electrical control are mainly divided into three categories: expert system control, fuzzy control and neural network control. On the one hand, I am mainly responsible for real-time monitoring of the system operation status to prevent the occurrence of faults, and automatically handle the faults when they have occurred. Control each switch quantity in the operation link, and integrate and analyze the data content of the analog quantity[5] .The concept of electrical automation control has been put forward for a long time, but the development space is still very large, the appearance of

artificial intelligence just further promoted the development process of electrical automation control, which is of great significance to reduce the working pressure of staff and improve production efficiency.

4. Conclusion:

To sum up, with the rapid development of economy and science and technology, people have put forward higher requirements for safety, stability and efficiency in production work.

The concept of electrical automation control has been put forward for many years, and it is widely used in various living and production environments. The appearance of artificial intelligence makes people realize the development direction and rising space of electrical automation control.

Based on the analysis of the advantages of artificial intelligence technology and the development process of electrical automation, this paper puts forward a feasible scheme of combining the two.

The utilization of artificial intelligence technology is the mainstream direction of current scientific and technological development. Giving full play to the advantages of artificial intelligence technology can greatly improve production efficiency and safety

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