

Research on the Combination of Computer and Electrical Automation Technology under the Background of the New Era

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Abstract

With the rapid development of social economy, electrical production technology is gradually exploring the direction of automation, which has penetrated into all areas of people's production and life. The current electrical automation technology and computer technology are gradually combined to optimize the design effect of electrical automation control systems. , To maximize the level of electrical automation control, meet people's needs for electricity, and promote the steady development of our country's society. This article discusses the structure of the electrical automation system. According to the combined application of computer and electrical automation technology under the background of the new era, it analyzes the optimization strategy of the combination of computer and electrical automation technology under the background of the new era.

Keywords

New era; computer; electrical automation; technology; integration.

1. Preface

The application of electrical automation technology has covered many fields and achieved remarkable application results. With the application advantages of computer technology, automation control technology has improved the intelligent and modern level in system design, and more and more obviously reflected the application advantages. The structure of electrical automation system is relatively complex. In the industrial field, it can effectively improve the efficiency of industrial production and innovate work forms. It is necessary to organically combine computer and electrical automation technology, give full play to the value of advanced technology, improve the control level of electrical automation and improve the system design.

2. Structural analysis of electrical automation system

Electrical automation has a relatively complex structure. It is an application of management and control system with the help of computer technology. It reflects the application advantages and unique characteristics of electrical automation control system and has achieved remarkable application results in many fields. For example, in the automobile production industry, using electrical automation technology to carry out automobile production activities can simulate the automobile production process and clarify the automobile production quality in advance, It is conducive to the staff to better achieve the production objectives. At this stage, electronic automation technology is gradually combined with computers, realizing the development of intelligence and transforming towards modernization and informatization. Based on the actual needs, the automatic selection of information integration channels can be carried out. For example, the use of computer human-computer interaction interface can improve the level of electrical automation technology and system control effect. In the system structure of electrical automation, it can be divided into many different components, including central monitoring computer, communication network server, main controller, remote workstation, fieldbus, field

controller, gateway, actuator, sensor, etc. among them, the field controller, communication network and main controller are very important equipment. For example, the field controller can be used in the process of building the electrical automation system of equipment, Comprehensively monitor the construction equipment, cooperate between the monitoring computer and the on-site controller, transmit and exchange information, and use the communication network as the medium for real-time transmission and exchange of information. The electrical automation control system covers two kinds of networks, namely primary network and secondary network. The primary network is also the local area network, and the secondary network uses standard bus control equipment. In the electrical automation system, the central monitoring computer is the most important part of the control device. It uses the local area network to connect to other equipment to build the whole system. In the electrical automation system, take the main controller as the central point, connect the primary and secondary networks, improve the structural functions, coordinate the actions of controllers at all levels in the system, and meet the communication requirements between primary and secondary networks. When connecting the secondary network, it is inseparable from the application of field controller. CPU card and I / O card are common field controllers, which can collect field signals and process and control them. After processing the signals, the main controller is used to exchange information with the upper computer^[1].

3. Combined application of computer and electrical automation technology in the new era

3.1. Computer monitoring system

For example, the centralized computer monitoring system and the distributed computer monitoring system can be divided into two modes to optimize the stability of the electrical monitoring system. The distributed monitor system monitor system can expand the function of the first mock exam system, promote the efficiency of information transmission, control the load of the center effectively, reduce the burden of the control center, and the working units are in an independent state. Even if there is a single module, the normal operation of the system will not be affected. Therefore, the stability of the distribution mode is stronger than that of the centralized mode. Using the distributed mode, combined with the application of computer and electrical automation technology, the monitoring system is constructed, and a computer monitoring system with perfect functions is formed by using relay protection module, equipment control layer and heating main control layer.

3.2. Data acquisition system

It is an important part of the data input and processing system in the electrical industry, which can combine the computer technology with the automatic data processing system. It is an effective part of the data input and processing system in the electrical industry, That is, the process of inputting, outputting and processing combined with many information and data in the process of production operation. With the passage of time, there are more and more data in the electrical automation control system, and the work of the data acquisition and processing system is becoming more and more important. In the operation of the system, collect the relevant data information of abnormal conditions in time, and be able to carry out the follow-up alarm and recording work, which is conducive to the relevant staff to obtain and process the abnormal information in time, improve the data processing efficiency and ensure the stable operation of the whole system. In the actual application process, the staff should pay attention to the integration of computer and electrical automation technology. Although the computer system can analyze and process a large amount of data and information, the application process must adopt a manual way to accurately process part of the work content, improve the

functionality of the data acquisition system, and effectively input all information in the electrical production operation, Improve the processing and output efficiency of information data^[2].

3.3. Communication network system

In the operation process of automation system, a large amount of information transmission is involved. Whether the communication network system has good operation quality and efficiency directly affects the timeliness and accuracy of information transmission in the operation of automation system, and determines whether the system can achieve the goal of safe operation and management. The combination of computer and electrical automation technology should ensure the reliability, stability and smoothness of the communication network system according to the actual requirements of electrical automation control, improve its information transmission ability, timely and efficiently complete the information interaction task, and have the function of fast and timely transmission of information. Therefore, it can be connected to Ethernet to improve the transmission speed of information and strengthen scalability. For example, during the communication process of the heating system, the system connection is carried out through Ethernet. It is necessary to adopt the way of integrated control and installation of the ground layer, and add the intelligent module to the system to collect all kinds of signals. In the communication function of the heating and dispatching system, the modem and emergency protection device are important basic components. The communication channel has been established to ensure the timeliness and smoothness of information transmission and meet the information transmission needs between different substations. With the combination of computer and electrical automation technology, the function of the communication network system has been further improved^[3].

3.4. Electro hydraulic control system

The electrical automation control system creates convenient conditions for people's daily work and life. The combination of computer and electrical automation technology is applied to the electro-hydraulic regulation system to improve the operation quality and efficiency of the electrical automation control system. In the traditional pneumatic system, the use of hydraulic control system is a more traditional control system, and the control method is backward. Today, with the rapid development of science and technology, the combination of computer and electrical automation technology constructs the electrical automation control system, in which the electrical equipment and related components used have good performance and quality. The electro-hydraulic regulation system replaces the hydraulic control system, and the function is more advanced. Because in the electro-hydraulic regulation system, using the main control device of computer, it can be divided into two parts: electronic part and hydraulic part. The electro-hydraulic regulation system has stronger function and has become the most widely used system in the current control system. It has advanced application performance. When operating the electro-hydraulic regulation system, the process is more simple and the risk of problems is low. Most notably, the electro-hydraulic regulation system can change the load in time, improve the control efficiency of the system, promote the continuous improvement of the operation efficiency of the electrical unit, maintain the stability and reliability of the unit operation, and save the economic cost investment, which reflects the application advantages and advanced performance of the electro-hydraulic regulation system and is widely used, It is an essential system application under the integration of computer and electrical automation technology^[4].

3.5. Data management system

With the support of computer, electrical automation technology has formed a data-based management mechanism and built a data-based management system. Electrical engineering

involves a wide range of disciplines, including mechanical design basis, program language, electrical basis, database operation, etc. completing various operations of electrical engineering with the help of computer can improve the level of electrical automation and reduce the error risk of manual operation, The time cost and personnel cost invested in the calculation are saved, and the overall quality effect of electrical design is improved. For example, in the data management system, according to the construction rules of electric power, enterprises can dynamically monitor the operation of construction personnel in the operation process, and improve the construction level and quality of electric power with the help of emerging technologies. Taking power grid dispatching as an example, in the application of electrical automation technology, power grid dispatching is the key link in the process of intelligent application. Managers combine computer and electrical automation technology, use computer data to promote the supply balance of power resources, maintain the operation stability of power grid, predict the model with the help of historical data, maintain the balanced supply of power resources, and reduce labor cost, transportation cost Computer monitoring of material costs, timely understanding of construction costs, price fluctuations and influencing factors in the construction cycle, reasonable adjustment of the plan, and ensuring the accuracy, timeliness and comprehensiveness of data in the data-based management system^[5].

3.6. Energy saving system

The combination of computer and electrical automation technology realizes the energy-saving function of system design, and uses data calculation to reduce energy consumption. In the integration of computer and electrical automation technology, electrical engineering uses advanced technical means to minimize the energy consumption of equipment, transform to the direction of green development, and meet the requirements of sustainable green development strategy, It has alleviated the energy pressure and resource consumption dilemma faced by China. Using the function of the combination of computer and electrical automation technology, carry out self inspection and self correction in the computer control system, conduct joint review with professional engineers, fill in the safety report after passing the self inspection and self inspection, and then carry out subsequent work, such as power laying, on the premise of ensuring the quality. With the help of the big data calculation function in the computer, the enterprise can optimize the design effect of the energy-saving system, optimize and improve the electrical engineering circuit, save energy, invest energy loss, improve productivity and emphasize green production. For some non key links, they can be eliminated or improved. Designers can use impedance elements with small resistance in the combination of computer and electrical automation technology, Replace the original components, save the loss of the transformer, prevent the problem of too fast loss of the transformer, and improve the safety of power consumption. Comprehensively check the materials of different batches, combined with the deterioration of the wire protective layer in the soil, ensure that there are no more than three cross lines in the same position, and it is forbidden to bind the lines side by side. Dynamically monitor the operation efficiency of electrical engineering, strengthen the close management of wire binding parts, control the current problem of high energy conversion rate from the root, improve the energy-saving level of electrical engineering, realize the combination of computer and electrical automation technology, improve the function of energy-saving system, and strengthen the driving force for the stable and sustainable development of enterprises^[6].

4. Optimization strategy of the combination of computer and electrical automation technology under the background of the new era

4.1. Strengthen the standardized management of equipment

In the future, in the process of combining computer and electrical automation technology, in order to further improve the application level of computer and electrical automation technology, we should strengthen investment in equipment management, improve the standardization of equipment management, ensure the operation efficiency of equipment and improve the performance of equipment in a normal and stable environment, so as to maintain the stability of the system and reduce the risk of system failure. In the daily equipment management work, we should focus on the equipment management, especially for the equipment prone to failure, we should carry out systematic and comprehensive inspection regularly, find the abnormal problems in the equipment operation in time, find the faults early and take effective prevention, maintain the stable operation of the equipment, improve the safety of equipment operation and prevent the possible adverse consequences of failure risk^[7].

4.2. Introduction of advanced experience

In order to promote the industrial development of the combination of computer and electrical automation technology, we can introduce advanced experience, technology and ideas, especially the experience and lessons of enterprises in some developed countries, which plays a positive role in the development of Chinese enterprises. With the advanced technology of foreign countries, enterprises learn from the outstanding experience of other countries, learn from each other's strengths and complement their strengths, combine the actual situation of our enterprises, and rationally use computers and electrical automation technologies to effectively improve the level of electrical automation. However, it is not to copy mechanically, but to select advanced ideas and methods, based on the actual situation of the enterprise, innovate the development concept, optimize the technical application effect of electrical automation, improve the advanced level of electrical automation technology, and transform and develop in a longer-term direction in the combination of computer and electrical automation technology^[8].

4.3. Strengthen talent construction

The support of human resources is an essential resource in the combination of computer and electrical automation technology. Facing the development trend of economic globalization and the fierce market competition environment, the combination of computer and electrical automation technology must increase investment in talent training, cultivate professional computer talents and electrical automation technology talents, and increase investment in talent introduction and training mechanism construction, Enhance the market competitiveness of enterprises. In the construction of talents, a professional comprehensive talent team for the combined application of computer and electrical automation technology is established through external introduction and internal training, so as to improve the development level of the combination of computer and electrical automation technology. For example, in the introduction of external talents, recruitment fairs can be adopted to introduce excellent computer talents and electrical automation technical talents into the enterprise. Talents are required to have strong technical level and rich work experience. For the cultivation of internal personnel, training activities and exchange activities can be organized and carried out regularly in combination with the current situation of the talent team, so as to strengthen the technical level of employees and improve their professional quality and professional ability, Enrich the talent team and provide talent support and guarantee for the combined development of computer and electrical automation technology^[9].

5. Conclusion

To sum up, with the continuous improvement of China's economic level, electrical automation technology has been more and more widely used in various industries, creating convenient conditions for people's life, improving the efficiency of industrial production and greatly reducing the burden of manual operation. Under the application integration of computer technology, the application effect of electrical automation system has been improved, which further improves the application performance of electrical automation technology, expands the application scope, promotes the further innovation of electrical automation technology, and lays a solid foundation for the development of electrical automation industry in China.

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