Application Analysis of Electrical Automation Technology in Electrical Engineering

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Abstract: Electrical automation technology covers many aspects, such as machinery, electronics, communication, electricity and so on. It has a wide range of applications and broad market prospects. At present, the technology of electrical automation is relatively mature. It can optimize the related operation of electrical engineering, achieve efficient work, and play a positive role in promoting economic development. Based on this, this paper begins with an overview of electrical automation technology. First, the application of electrical automation technology in electrical engineering is analyzed, and then the matters needing attention in the application of electrical automation technology in electrical engineering are explored. It is hoped that the combination of electrical engineering and electrical automation technology can provide some reference.

1. Introduction

The development of electrical engineering in China has undergone a lot of changes, mainly through the introduction of technology to change the traditional drawbacks, in order to enhance its ability to serve the society. At present, electrical engineering is an indispensable part of life and production, and also an important driving force for economic development. In the coordination and control of electrical engineering, electrical automation system plays an indispensable role. On the one hand, it improves efficiency through the high-speed operation of computers, on the other hand, it improves stability through intelligent and automatic control. With the continuous improvement and perfection of electrical automation technology, the current aspects of electrical engineering application are further increased. The efficient combination of the two not only makes the electrical automation technology further developed, but also improves the advanced degree of electrical engineering.

2. Overview of Electrical Automation Technology

2.1 Development Status of Electrical Automation

At present, China's electrical automation technology is still in a period of rapid development, the related technology has been relatively mature, can provide practical help to actual production. Of course, technology still needs to be constantly updated, so as to continuously meet the needs of social production. At present, electrical automation technology has been widely used in many fields, especially in machinery, communication and electronics. Its appearance has overturned the traditional production mode. Modern science and technology has effectively improved the efficiency of production, but also reduced the output of manpower. Therefore, electrical automation technology has been continuously introduced in different fields to optimize production and promote reform. 。

2.2 Common Electrical Automation Technology

In the field of electrical engineering, the current commonly used electrical automation technology

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mainly includes the following aspects:

(1) Centralized monitoring technology. Centralized monitoring technology mainly uses the central system to achieve the overall coverage of monitoring. It optimizes the traditional complex monitoring mode through the integration of lines, and the requirement of centralized monitoring on the working environment is not high. So it can not only improve the efficiency of work, but also reduce the use of consumables. It has a positive significance for cost reduction and economic efficiency improvement.

(2) Remote monitoring technology. The remote monitoring technology mainly realizes the remote control of the monitoring system through network communication and computer. It further improves the intelligent degree of monitoring through the remote monitoring technology. It also avoids the limitation of space and time, and makes the electrical engineering more flexible. Because of the form of remote control, it can effectively reduce the cost of monitoring. Of course, remote monitoring technology has its own limitations. It must be realized by means of communication network. Therefore, if the monitoring system is too large, it will not be able to achieve remote monitoring.

(3) Field bus monitoring. Fieldbus monitoring technology is based on the needs of the project to formulate the management plan. It is an alternative monitoring technology with strong pertinence and can also play a role in controlling the cost of the project. In addition, fieldbus monitoring technology has its own independence, so it will not affect the normal operation of the project, mainly in electrical engineering to ensure the reliability and stability of equipment, so that the device can operate independently. At present, fieldbus monitoring technology is widely used in electrical engineering, which has a positive significance for improving safety and reliability.

2.3 Advantages of Electrical Automation Technology

Electrical automation technology can further improve the structural performance of electrical engineering to meet the unified requirements of diversification and integration. At the same time, after the adoption of electrical automation technology, the degree of automation and intellectualization of electrical engineering has also been significantly improved. The detection and inspection of various equipment is more convenient. At the same time, remote control can also be carried out through the central processing unit, which has a positive significance for the optimization of the daily management of electrical engineering. In addition, the electrical automation technology is very convenient to operate after the system is built, which further simplifies the work of employees, which has a positive significance for improving the economic efficiency of enterprises. In the current electrical engineering, electrical automation technology has become an indispensable part. Therefore, related industries are increasing technology research and deepening the introduction of electrical automation technology. In terms of power system, electrical automation system is introduced in many aspects such as power grid dispatching, power station and relay protection, so that the whole ceremonial system has certain autonomous operation ability, can judge the collected parameters, and give the preset indicators. From the specific effect, electrical automation technology has also effectively achieved the desired goals, so its application will be further expanded, and technology will tend to diversify the direction of development.

3. Application of Electrical Automation Technology in Electrical Engineering

3.1 Power Network Dispatching

The work of power grid dispatching is more complex, so traditional electric control will spend a lot of time in power grid dispatching, and once a fault occurs, it will spend a lot of time to maintain the fault, which not only seriously affects the normal power consumption of residents, but also consumes a lot of manpower. Using electrical automation technology to control power grid dispatch can effectively improve its stability and reliability, and make the operation more stable. Of course, after the failure can also be analyzed through the database, quickly find the fault points and causes, so that staff can be prepared to carry out fault maintenance, while the time to reach the fault location can also be greatly reduced, can reduce the loss of power companies.

3.2 Application of Substation Electrical Automation Technology

Traditional substations need a lot of manual operation, which not only causes data deviation, but also reduces the efficiency of work. And sometimes, in order to ensure the progress of work, people need to rotate 24 hours, which greatly increases the input of human capital. Electrical automation technology can effectively solve this problem, not only the accuracy of data has been effectively guaranteed, but also the fault detection is more timely. In addition, the electrical automation technology can also reduce the input of manpower, and use automation to carry out data transmission, which enhances the reliability and stability of operation.

With the continuous development of science and technology, substations in our country are constantly reducing manpower investment, using automation technology to achieve a modern operation mode, and technology has been preliminarily mature, the future application will be more advanced, not only to improve the substation's adaptability, but also to reduce the operating costs of power enterprises and increase their economic income.

3.3 Application of Electrical Automation Technology in Power Plant

The control system of power plant is very complex and decentralized, which involves the comprehensive application of various technologies. In the traditional operation, engineers need to supervise and maintain for a long time, and the corresponding parameter setting should be followed up at all times, so as to ensure stable operation. However, due to the uncertainty of manpower, the stability of the whole power plant operation is greatly affected. Electrical automation technology can well alleviate this drawback, through the computer, network and control terminals can be automated control, through the collection of parameters and operation output set control actions, so as to make the operation of power plants more stable and reliable.

In addition, there are certain safety risks in the work of power plants. If more people are employed, it is easy to cause various accidents. The use of electrical automation technology can reduce human output, and control the terminal away from the center of power plants, which can make the operation of power plants safer.

3.4 Simulation Application of Electrical Engineering

Electrical engineering technology in the process of development has tended to be true, in advance of the establishment of models, input certain parameters after the corresponding results. The realization of this technology is mainly accomplished by electrical automation technology. On the one hand, it realizes the optimization of power system management, on the other hand, it realizes dynamic monitoring through simulation modeling, which is conducive to improving the speed of data processing and providing data support for corresponding decision-making.

Simulation is the main application direction of electrical engineering, because the current electrical engineering tends to be intelligent and automatic control. Before setting up the system, it is necessary to improve its correctness through simulation. In this process, it must be applied to the electrical automation technology. Intelligent control is used to realize the docking between reality and virtual, and the system vulnerabilities can be detected in advance, so as to reduce losses and troubleshooting.

3.5 Technical Integration of Electrical Engineering

The huge electrical engineering system involves the collection of many subsystems, so the whole operation is very complex. Once problems arise in small aspects, it is easy to affect the whole electrical engineering. Therefore, in order to achieve its automation and optimal management as far as possible, it is necessary to integrate technology through electrical automation technology to make management more scientific and standardized. In the traditional power system, security and maintenance are separated, and many links have problems in docking, which not only affects the efficiency of work, but also increases the cost of operation. After the introduction of electrical automation technology, the corresponding management has been greatly improved, the overall integrated system has been optimized, and the comprehensive application of modern technology can

effectively improve the efficiency of power system, and the service capacity has also been greatly guaranteed.

4. Notices for Application of Electrical Automation Technology in Electrical Engineering

4.1 Coordination and Unification of Multiple Links

Electrical automation technology needs to coordinate and unify many aspects of electrical engineering in order to carry out automatic calculation and control. However, in the current improvement, there are some problems in the unity of many links. Because of the traditional segmentation management, the operation after the merger is not smooth. Therefore, unification must be taken as the precondition in the subsequent application of electrical automation control technology. Only in this way can we use modern network technology and computer technology to achieve efficient operation and improve management ability. This requires the classification and modification in the early stage, the establishment of a unified system, and the centralized solution of the problems in the preliminary trial operation to ensure that the desired objectives can be achieved.

4.2 Focus on the Unification of Electrical Automation Equipment

Although the technology of electric automation in China has been mature, the quality of technology in the industry is uneven because of its short development time. Especially for the manufacturers of electrical automation equipment, because they lack the corresponding technology sharing, there are problems in compatibility and unity of equipment, which is not conducive to the unified application of electrical automation equipment. At present, our country is vigorously building industry unified standards, which is the key to improve the unification of electrical automation equipment. For electrical engineering, when choosing equipment and technology, the compatibility and interchangeability of the whole system should be taken into account. Once the equipment fails and needs to be replaced, the selection should be targeted. Only in this way can the stability of the system be ensured.

4.3 Extension of Ethernet Technology

Ethernet technology can improve the operation speed of electrical automation system and save manpower and material resources, which has a positive significance for the operation optimization of electrical engineering. At present, the social demand of electrical engineering is increasing, which leads to large-scale electrical engineering systems spend a lot of time in data processing, which not only affects the efficiency of work, but also may cause calculation errors due to the interference of many factors. At this time, we need to further expand the application of ethernet. The control system of electrical engineering is connected with the Ethernet network to improve its effectiveness and authenticity.

5. Conclusion

Electrical engineering is an indispensable part of our country's power system, and also an important guarantee for people to make your normal production and life. However, due to the complexity and comprehensiveness of electrical engineering, various problems often arise in traditional operation, which not only consumes a lot of manpower and material resources, but also leads to great obstacles to the improvement of its service capacity. After the application of electrical automation control technology in electrical engineering, the traditional working system has been optimized, which not only realizes the intellectualization and automation, but also improves the efficiency of its work and further improves the economic benefits. Moreover, the automation control of electrical engineering can also improve the economic efficiency and make the operation more stable and reliable. Based on this, this paper focuses on the application of electrical automation technology in power grid dispatching, substation, power plant, simulation and technology integration, hoping to provide some reference for the application of electrical automation technology in electrical

engineering.

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