Research on the Application of Electrical Automation Technology in Power Engineering

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Abstract: Electric power engineering is a project closely related to everyone. To ensure the stability and safety of electric power engineering operation is to guarantee people's quality of life.The application of electrical automation technology in electric power engineering can improve the operation efficiency and safety of electric power engineering, which is the key technology to be paid attention to in the development of electric power engineering.This paper discusses the application and development of electrical automation technology, hoping to be helpful to the application and popularization of electrical automation technology.

1. Introduction

Electrical automation technology, in essence, through the automatic operation of equipment, to reduce the power engineering some links of the human operation, or even cancel the human operation.This not only saves labor cost, but also has higher working efficiency and stability compared with human operation. Meanwhile, the power equipment can provide real-time monitoring all the time.According to the current situation of electric power engineering, in order to adapt to the increasing power demand, it is necessary to constantly improve and optimize its own electric power technology, so as to make each link in the electric power engineering more intelligent and automatic.And the electric automation technology, can satisfy this electric power engineering development trend very well.This technology can greatly improve work efficiency and reduce work cost, which is an important part of power engineering research.

2. Type and Application of Electrical Automation Technology

Before analyzing the application of electrical automation technology, it is necessary to understand the types of electrical automation technology.By discussing the main points of application, the application of electrical automation technology can be studied more comprehensively.

2.1 Type of Electrical Automation Technology

In the actual operation of power engineering, electrical automation technology will be involved in almost every link, and the types of application mainly include the following three types [1].

Distribution technology automation.In the power distribution system of power engineering, the application of automation technology can deepen the automation and networking degree of the whole power network system, so as to promote the effective development of the power distribution system.Distribution technology automation can make power system distribution more intelligent and automatic, and make power system distribution more safe and reliable.

Substation technical automation.Substation technical automation mainly refers to the organic combination of communication technology and computer technology, intelligent collection and arrangement of substation information, can make the substation operation scientific and reasonable.The technical automation of substation plays an important role in the operation of transformer substation by analyzing the data and information and optimizing the configuration of substation grid structure.

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Power dispatch automation technology.In the power dispatching of the power system, if the objective factors such as power demand are not taken into consideration, the distribution of power will not be reasonable, and it may even cause the waste of power resources.The application of electrical automation technology in power dispatch can help relevant personnel to work out the most reasonable power dispatch optimization plan through the integration and analysis of relevant information.In this way, the working time of power dispatching can be greatly saved, and relevant staff can understand and master the grid operation in an all-round way, so as to realize scientific dispatching.

2.2 Key Points of Application of Electrical Automation Technology

Security.Safety has always been an important issue in power engineering.Compared with other industries, the related technical work of electric power engineering will have higher safety hidden danger, so no matter what kind of technology application in electric power engineering, safety problem should be considered first.When using electrical automation technology, relevant personnel must ensure the efficient and safe operation of the power system on the basis of safe application [2].

Economy.In the development process of electric power engineering, the overall demand for electricity is relatively large, so the power system will be restricted by economic efficiency, so the cost of electrical automation will often produce certain restrictions on its application.In order to make the electrical automation technology widely used in power engineering, it is necessary to control the use cost of electrical automation, under the premise of ensuring economic benefits, the implementation of electrical automation technology.

Data processing.Data collection is an obvious application advantage of electrical automation, so it is necessary to comprehensively strengthen the data processing function of electrical automation technology in practical application.The data processing function of electrical automation is guaranteed by means of technology upgrading and power engineering planning.In the application process of electrical automation, it is necessary to ensure the accuracy of information processing in the system and improve the stability and efficiency of the overall power system through the processing of abnormal data information.

3. Application of Electrical Automation Technology in Power Engineering

3.1 Automation of Power Enterprise Monitoring System

Electrical automation technology in the application of the monitoring system of electric power enterprises, mainly refers to the electrical automation technology can carry on the supervision and management, to the monitoring and control system for the real-time operation of the electric power enterprise monitoring system clearly grasp, to understand whether the related electrical equipment normal use, so as to ensure the safe operation of power system.According to the current application status of electrical automation, the application of monitoring equipment in power enterprises is mainly composed of three parts, namely the regional master station monitoring center, station terminal and network client.The monitoring center of the regional master station is a monitoring system equipped in each district. While providing users with relevant information services, it also provides users with comprehensive monitoring information services through electronic map equipment.The station is mainly responsible for collecting and processing relevant data, and then realizes effective docking with the relevant traditional system and network server, which can provide a good data foundation for the operation of the monitoring system of power enterprises [3].For power customers, the information can be viewed through different account passwords in the network client.The automation of this monitoring system is one of the revolutionary achievements of electrical automation technology.

3.2 Automation of Power Enterprise Monitoring System

The application of electrical automation technology in the diagnosis of equipment faults can not only realize the intelligence and automation of power engineering, but also diagnose and detect the

equipment faults in power engineering to ensure that the power equipment can be in the best performance state.When the electrical automation technology detects that the risk is greater than the set threshold, it sends a signal to managers and can process the electrical equipment effectively.And some of the more advanced automation equipment in the face of failure, even can realize automatic processing.This kind of fault diagnosis of electrical automation technology, can quickly and accurately find the related fault, to ensure the safe operation of the power system.Due to the variety of power equipment, the related performance of electrical automation technology is constantly improving.For example, when the power system is monitored and checked, the decision of the automatic system is usually made under the normal value and state of the equipment, so it has more reasonable application monitoring. Moreover, the electrical automatic equipment can record and save the fault data intelligently, providing data support for the subsequent manual processing.If the monitoring value exceeds the normal value range, the automatic system will send out an alarm and automatically work out the relevant emergency plan, which plays an important role in the relevant equipment diagnosis.Electrical automation technology can not only help power equipment to monitor and analyze faults when they come, but also diagnose some faults in advance when the equipment is in normal operation [4].The electrical automation system can compare the actual operation value of the power equipment with the normal value to judge its possible influence on the power equipment, and at the same time, according to the actual requirements, to adjust some of the value up or down, can effectively ensure the stable operation of the power equipment.

3.3 The Application of Electrical Automation Technology in Power Grid Dispatching is Reflected

The application of electrical automation technology in power dispatching can be analyzed according to basic computer technology and communication technology.First of all by Automatic power monitoring technology collects regional power transmission situation and power demand usage situation, and then uses the communication situation to quickly transmit to the relevant personnel, the staff can carry on the in-depth analysis of the power situation through the computer basic technology, so as to work out the optimal grid dispatch plan.In the traditional power dispatching work, once the power dispatching fault occurs, it is often difficult for the staff to understand the fault type and location in the first time, which has the potential safety hazard of power accidents.After the application of automation technology in power grid dispatch, the computer can accurately display the operation of the entire power grid, and can clearly locate faults and quickly respond to them.In this way, in the actual dispatching work, relevant personnel can avoid numerous dispatching risks and ensure the safety of power transmission.

3.4 Automatic Application of Field Technology

In the process of electric power engineering development, laying and controlling of many buses has gradually become an important part of electric power engineering, which requires a large number of instruments and equipment to carry out the detection of electric power engineering projects, so as to ensure the efficient transmission of information between different electric power equipment.The equipment used for testing is also an important part of the application of electrical automation technology.When the automation technology is used to control the field, the intelligent data collection can also be realized.The automatic application of electrical automation field technology can effectively avoid some cognitive factors and has certain application advantages.Decentralized measurement and control system is a kind of electrical automation technology commonly used in power system generation. It is composed of numerous communication and control facilities, which can efficiently detect the power generation process of power plants and ensure the stability of power generation.

4. Conclusion:

As a more intelligent and automatic technology, electrical automation technology can improve the work efficiency of many links of electric power engineering and greatly improve the safety of

the entire electric power engineering.Electrical automation technology is the key to the future development of electric power engineering, so we need to pay more attention to electrical automation technology.

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