Application strategy of electrical automation technology in electrical engineering

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Abstract: Based on the continuous improvement of China's current scientific level, electrical engineering enterprises must further innovate their own engineering technology in order to maintain good electrical engineering ability. Electrical automation technology can not only enhance the technical safety and stability of electrical engineering related work, but also improve the work efficiency of electrical engineering. Therefore, it has a relatively light application scope in the field of modern electrical engineering. When the development of electrical engineering enterprises, we should comply with the technological development and fully apply electrical automation to modern electrical engineering in our country. Electrical automation technology is based on the integration of artificial intelligence technology and mechanical control technology. This technology comprehensively integrates automation technology and electrical engineering to promote the automation development of electrical engineering application in management. In order to change the inherent defects of electrical engineering, it is necessary to improve the application of electrical automation technology and fully improve the safety and quality of power network. Therefore, this paper deeply discusses the positive presentation of electrical automation technology in the field of electrical engineering, analyzes the innovation and development of electrical automation technology, and provides reference for the development of electrical automation in China.

1. Introduction

The era of electrification hastens the development of human society. The practical application of electrical equipment and the maturity of electrical automation technology meet the needs of socialized mass production and further develop social productivity. In order to overcome the limitations in practical application and help electrical automation technology serve electrical engineering construction, the essence of electrical automation technology is to better realize the independent monitoring and automatic regulation of electrical system, Integrating automatic control and automatic inspection is a new automation technology. In the context of electrical automation, comprehensively detect the electrical system, first find the existing problems, and effectively solve these problems, so as to fully avoid the waste of human resource cost and manual operation. Moreover, electrical automation can improve the accuracy of monitoring results, ensure the stability of the system, prevent sudden problems, promote the application of electrical automation technology to all walks of life, improve work efficiency and promote social and economic development. Informatization and intellectualization are the greatest advantages and the most basic principles of the application of electrical automation technology. The direct purpose of using electrical automation technology in the process of social mass production is to improve the convenience of operation and promote economic and social development on the basis of providing convenience. Because if the basic process requirements cannot be met, the actual production needs cannot be met, and the electrical automation technology realizes the organic combination of electricity and machinery. Through the full use of computer technology and comprehensive consideration, the electrified equipment with reliable quality, high operation convenience and stable function is selected.

Electrical automation technology itself has the characteristics of multi-disciplinary intersection. It is designed to have a wide range of disciplines and a higher degree of specialization. On the basis of the rapid development of high-tech industry, electrical automation technology mainly depends on electronic information technology and computer network communication technology. Therefore, the design of software and hardware in electrical automation system is very important. Software is the

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guarantee and hardware is the foundation. The normal operation of the whole electrical system depends on it. Therefore, the design of the technical implementation scheme needs to be combined with the specific use situation. In order to adjust the power system, reduce the time required for the response of the power system, improve the work efficiency, ensure the smooth operation of the power system and improve the degree of safety, the electrical automation technology uses the self-regulation function realized by the intelligent controller to break through the limitations of space constraints, making remote control possible. The automatic regulation of power system also has technical support because of this real-time and long-distance self-regulation function. The electrical automation system itself has the ability of monitoring and has a high degree of informatization. It can feed back the problem information in time and quickly, so as to help the staff better grasp the operation situation, respond quickly and take countermeasures. The software and hardware facilities provided by the electrical automation system meet the requirements of electrical engineering and fully meet its requirements for facilities. The higher their informatization level, the higher the regulation level of electrical automation, and the better the development of electrical engineering relying on the informatization level. The realization of electrical automation system needs the strong support of computer technology. In a variety of technologies integrated into its own design, it needs computer technology as support. With the utilization of computer technology, the design speed and quality are significantly upgraded, and the labor cost and time cost are reduced. In case of deviation, it can be quickly modified and remedied by computer. Therefore, computer technology realizes the upgrading and optimization of electrical engineering design, so that designers can better master the core knowledge of electrical equipment, ensure that the design quality of electrical equipment can meet the needs of consumers, and make the whole design process easier to operate and carry out.

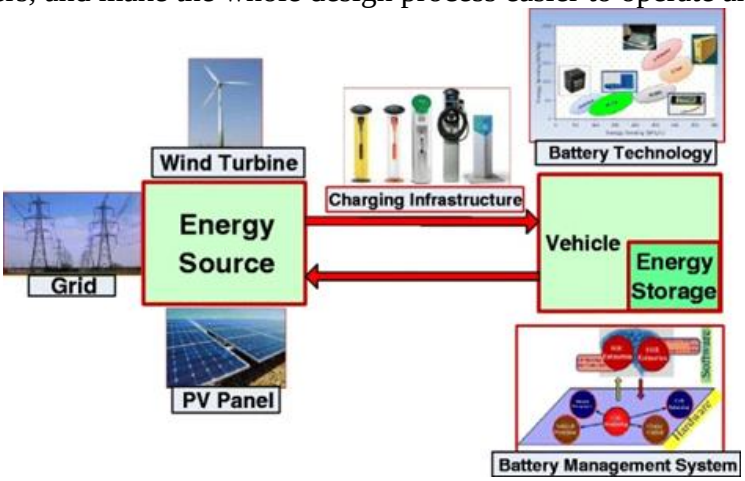

Figure 1 Power supply framework

2. Shortcomings of electrical automation technology

2.1 Electrical automation equipment is greatly affected by external environmental factors

During the actual operation of the equipment in the automatic electrical engineering control, if it is affected by the surrounding environment, it cannot be effectively solved, and these direct effects are usually not avoided. However, the equipment used for the automatic engineering control of the electrical industry often needs to be used under the environmental conditions to implement the necessary electrical automation technology, When preparing to use various electrical engineering automation equipment, it is also necessary to monitor the overall use and operation environment of the whole equipment in real time, which greatly increases the difficulty of technical use and management of electrical automation control equipment.

2.2 The effect of electrical energy saving is not significant enough

The poor performance of electrical production engineering controlled by electrical automation industry technology is the current obstacle to its promotion, 1. One of the most important technical

problems. On the one hand, all kinds of resistance heating of transmission lines exist objectively and can not be effectively eliminated; On the other hand, the current may also pressurize the whole transmission electrical line, resulting in resistance heating and power consumption. This problem is particularly prominent in the electrical industry in the building.

3. Application strategy of electrical automation technology

3.1 Research and development of energy-saving technology

The key to electrical automation innovation is to strengthen energy conservation and optimize environmental protection performance, so that the performance of electrical automation technology can better serve electrical engineering. On the one hand, we can start with the selection of resistance. Due to the influence of electric energy transportation resistance and distribution line problems, the electric energy consumption increases, and the operation cost of electrical engineering also increases accordingly. Improving energy-saving performance and reducing resistance is the key. Reasonable optimization can be carried out through the design of resistance cross-section and length to reduce power loss and circuit resistance, realize energy-saving transformation in the process of power transmission, and improve the energy-saving performance of electrical automation technology as a whole. Especially for equipment with high energy consumption, voltage transformation and energy saving are essential. Selecting wires with strong stability can not only ensure effective conduction and automatic regulation, but also upgrade energy-saving optimization and achieve energy-saving goals. The above operations are based on the energy consumption characteristics of automation technology and the operation needs of electrical engineering. The R & D and adoption of energy-saving technology not only ensure the further use of automation technology, but also maintain its own advantages, make the distribution system and automation technology more coordinated and perfect, reduce energy consumption and cost, and achieve coordinated development of economic and social benefits.

3.2 Implement integrated management and control

The establishment of integrated management and control system can break the bottleneck that traditional control technology can not meet the needs of management and control under the new situation. The so-called management and control integration is a measure that combines automatic control and intelligent regulation, effectively connects various engineering links while carrying out technological innovation, and aims to improve production quality and production efficiency. For example: when collecting the operation status of electrical equipment, the transmission details and communication details of each link are optimized through control technology to realize accurate signal transmission and scientific integration, so as to ensure the coherence of signal reception and instruction transmission. For another example, the integrated control system can use network management to realize the intelligent control of electrical equipment, or through signal command. In case of equipment failure, the control system will send out an alarm in time and automatically, and display the fault location and the cause of the error at the same time, so as to ensure the timely solution of the fault and improve the stability of project operation. These technologies can not only realize the control optimization of electrical engineering and the integration of management and control, but also highlight the control advantages of automation technology and promote industrial progress with technology.

3.3 Improving artificial intelligence

Artificial intelligence is the pursuit of automation technology, one of the main objectives and one of the significant advantages. It breaks through the limitations of low production efficiency, time-consuming and laborious fault measurement and failure to ensure accuracy under the traditional manual mode, makes up for the deficiency that the traditional manual production capacity lags behind the market demand, and contributes technical support and driving force to improve the engineering production efficiency and engineering production quality. The use of automation technology in

electrical engineering can apply artificial intelligence to the operation of obtaining fault location and fault information, conduct real-time monitoring of the whole process, accurately determine the fault source by using the signal transmission mode, take emergency response measures, prevent the problem from spreading, and ensure the operation efficiency and quality. Therefore, artificial intelligence technology needs to be continuously improved, optimized and expanded to reduce the burden and pressure of troubleshooting, improve the speed and accuracy of problem troubleshooting, and ensure the normal operation of electrical engineering.

3.4 Strengthen network management

Network management should also be included in the automation construction of electrical engineering, because automation technology is inseparable from the support of network technology. The coordinated and unified use of network technology and automation technology is also the key to the long-term development of electrical engineering. We are not unfamiliar with the network. It has penetrated into all aspects of our life, production, work and study. In the electrical field, the network is also unique and plays an irreplaceable advanced role. Strengthening network management and applying network technology to the automatic management of electrical engineering is also an inevitable requirement under the current situation. Network management mainly involves the following aspects: obtaining data and information, integrating data and information, analyzing data and information, exchanging and transmitting information. This realizes the integrated network management of data and makes the system run more efficiently. For example, in the process of signal transmission, in order to avoid data signal interruption and ensure the stability of data transmission, the data interface must be strictly reviewed and the factors affecting the interface connection must be handled in time. In order to clarify the parameter standards and requirements, the equipment parameters and fault types can be recorded in the data management system in the form of input on the network, so as to facilitate the final integration and analysis of data. For example, when overhauling and maintaining electrical equipment, the monitored parameter information can be compared with the standard parameter information recorded in the network system. If there is any deviation or problem, respond immediately, adjust and carry out follow-up work.

4. Strengthen the innovative strategy of the application of electrical automation technology in electrical engineering

4.1 Optimize electrical projects

The application of electrical automation technology can significantly improve the operation quality of electrical engineering. Therefore, it is necessary to further improve the application quality of electrical automation technology, especially the optimization of electrical projects. However, there are many projects that need to be optimized in the electrical project, and the system has different optimization requirements in different links. Therefore, in the actual electrical project optimization, it is necessary to fully grasp the specific work tasks and performance requirements, effectively excavate the problems, timely communicate with various departments and professionals, and ensure the detailed optimization function of the electrical project, Provide necessary guarantee conditions for promoting the overall operation quality of electrical engineering. At the same time, in the further optimization of electrical projects, the system operation cost will also be significantly reduced, which can provide guarantee for the improvement of economic benefits of electrical engineering.

4.2 Improve the energy saving of electrical automation

At present, the application of electrical automation has played an important role in improving the work quality and efficiency of electrical engineering, but the problem of energy consumption always exists, especially in the construction of electrical engineering in the construction industry, the power resources generated by the resistance transmission of power pipeline can not be effectively saved, the rapid rise of line temperature has also become an inevitable phenomenon, and the sudden increase of power cost increases the actual construction cost. In this case, electrical engineering technicians

should also further help the construction personnel master the actual situation of electrical equipment as soon as possible, plan a reasonable power work plan in detail, minimize the waste of power resources, and then improve the economic benefits of the project.

4.3 Application of PLC technology to provide control function

PLC technology can play an effective control function for a certain control link of the project, and then significantly improve the control quality. Moreover, the application and operation of PCL technology is relatively simple and convenient, and it can also reflect great application value in the application cost of technology. PLC technology has a broader development prospect in the field of electrical engineering in the future. In the case of electrical automation technology combined with PLC technology, it can improve the operation quality of the system, and PLC technology will replace the existing control equipment. On this basis, it can greatly reduce the cost of the existing control equipment in the actual work, and plays an important role in promoting the operation efficiency of electrical automation. In the application of PLC technology, it is necessary to do a good job in the planning and design of the programming program to ensure that the program meets the technical application and reduce the number of errors in the program as much as possible.

4.4 Protect external equipment

In electrical engineering and its automation equipment, there are some common defects, that is, the external equipment is very vulnerable to external environmental factors, such as low temperature, high humidity, excessive air pressure and sudden climate change, which may have a certain impact on the normal use of internal parts of the equipment. In serious cases, it may even directly lead to the failure of normal application of the equipment and increase the maintenance cost of the equipment. In order to avoid the above problems, it is necessary to do a good job in the basic protection of external equipment, strengthen the quality of external equipment protection, regularly calibrate and measure the damage of equipment, and ensure the normal operation of equipment.

4.5 Unified system development platform

At present, electrical automation technology has been widely used in electrical engineering, and people realize the contribution and role of modern technology. Due to the needs of technology, number of cases, concept and other factors, there are many problems in the development of system platform. The lack of unity of the system platform leads to the lack of standardization in the application of automation technology, which leads to many problems. The unified development of the system platform can save capital cost and time cost, facilitate design optimization, and unify the standard at the same time. During the development of the system platform, it is necessary to implement unified management of the system development according to the unified goal, so as to strengthen the timeliness of the platform system and ensure the unification of the power system.

5. Conclusion

The application of electrical automation technology in electrical engineering can improve the safety and reliability of system operation, improve the effectiveness of system management and control, and improve the application value of electrical engineering. The practical application of electrical automation technology in electrical engineering is mainly reflected in three aspects. On the one hand, the application in power dispatching can promote the operation of distribution network to be more safe and reliable; On the other hand, the application in power measurement and control can ensure the safe transmission of power and improve the operation efficiency of power plant; Finally, the application in intelligent substation can promote the realization of efficient operation mode.

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