On Automation Practice and Application in Applied Electronics

Cai Weigang

Xi'An Aeronautical Polytechnic Institute, Shaanxi, Xi'an, 710089, China

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Abstract: With the continuous development of the socialist economy, the demand standards of various industries in the society for the power system are increasing, and the traditional human power supply has been difficult to meet the needs of social development. At the same time, the development and popularization of modern information technology provide good opportunities for power system development. The application of electronic information technology to the power system can not only increase the speed of operation of the power system, but also enhance the efficiency of the power system, save labor costs, and improve Economic benefits of power enterprises. This article analyzes the relationship between power automation systems and electronic information technology, specifically analyzes the practical advantages of electronic information technology in power systems, explores the application strategies of electronic information technology in power automation systems, and explores the role of electronic information technology in power automation systems. The development direction aims to provide a reference for the better application of electronic information technology in power automation systems.

1. Introduction

The development of modern information technology affects people's daily life and also brings good development opportunities for the power system. The power system is an indispensable element for the long-term development of various sectors of society, and it is also an important part of building a harmonious society in my country. The use of electronic information technology in the power system can make the power system develop towards automation, intelligence and mechanization, help to improve the systematization and scientificity of the power system, improve the efficiency of the power system, and have a positive reality for the sustainable development of power companies significance. Therefore, this article focuses on the practice and application of electronic information technology in power automation systems, with a view to further promoting the integration and development of electronic information technology and power automation systems.

2. Interrelationship between Electric Power Automation System and Electronic Information Technology

In the power system, substation, distribution, transmission, and power generation are the basic working links. Transformers, switches, transmission lines, and generators are primary power equipment. Communication facilities, computer systems, computer monitoring systems, protection systems, and measurement and control The system etc. are secondary equipment. Under normal circumstances, the application of protection and regulation devices to primary power equipment can strengthen the safety performance of power systems, reduce labor costs, and improve the economic benefits of power companies. At the same time, secondary equipment is widely used in the power system, which is the basic guarantee for the normal operation of the power system. In the modern social environment, power system automation is an important development direction for my country's power companies, involving distribution grids, power dispatching, and power generation control. It mainly refers to the automation and systematic management of power transmission, power dispatching, and power generation control. Power system automation involves many fields, such as detection, adjustment, and control in the production process; power supply devices and

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power system security protection systems; information transmission and economic management of power entrepreneurs, etc., are inseparable from automation technology. The main purpose of the current use of electronic information technology in power automation systems is to stabilize the power voltage and frequency, ensure the safety performance of the power system, and enable people to use electricity normally.

Electronic information technology is mainly through the use of computers, information technology, etc. to transmit, analyze and transport network data information and other automated information technology. Electronic information technology replaces the traditional data information transportation and transmission, reduces the pressure on the staff, makes the communication technology, household appliances and computer network test automation and scientific operation management, improve work efficiency and increase economic benefits.

In the actual production process, the power automation system can systematically monitor different work links to ensure that there are no leaks in each work link, so that the power system can operate safely and stably, and ensure that people use electricity normally. In recent years, with the rapid development of modern information technology, people's demand for electricity has been increasing. Under this social trend, traditional power systems are facing great pressure, mainly manifested in the basic work of traditional power systems such as voltage transformation and power generation. The stability of the link is not strong, coupled with the limited energy of the staff, they cannot be responsible for the supervision of the operation of the power system at all times. As a result, the power system operation is prone to leakage safety performance degradation, and it is easy to cause problems such as mechanical equipment failure and affect the normal transmission of the power system Electrical energy. Therefore, the application of electronic information technology to power automation systems is an inevitable trend for the development of power companies and an important direction for the development of power systems. The in-depth application of electronic information technology can not only realize automatic monitoring of the power system, reduce labor costs and improve the safety performance of the power system, but also strengthen the production level of the power system and improve production efficiency. All in all, electronic information technology is the fundamental guarantee for the automated operation and management of the power system. The use of electronic information technology in the power system can further explore the optimization direction of electronic information technology and provide a practical basis for the better development of electronic information technology in the future.

3. The Practical Advantages of Electronic Information Technology in Power Automation Systems

3.1 Improve Work Efficiency

Electronic information technology is an inevitable requirement for the development of the times in power automation systems, and it is also an important way to promote the continuous improvement and development of my country's scientific and technological level. The application of electronic information technology to power automation systems can shorten equipment commissioning time and increase the speed of power equipment operations, so that power production operations operate strictly in accordance with standard standards, which helps power companies control production costs and improve work efficiency. Therefore, power companies should dig deeper into the fusion of electronic information technology and power automation systems, strive to improve electronic information technology, and promote the better development of power automation systems.

3.2 Optimized Working Mode

The power automation system mainly includes the basic working links of power generation, transmission and transformation. The optimization of the work mode is mainly to improve the unstable operation of the work equipment in the traditional labor mode and improve the production standard of the power automation system. In fact, in the actual power production process, the

operation of the power automation system is more complicated, and the professional skills of the workers are higher. If the workers who install the power automation system do not have professional knowledge, they will face huge challenges. In this case, the use of electronic information technology can simplify the operation of the system and reduce the difficulty of operating the power system. Non-professional staff can complete the installation of the power system simply by referring to the operation manual.

3.3 Stable Operating System

The use of electronic information technology in the power automation system can improve the stability of the power system, and the staff can more accurately control the operating time of the power system, thereby improving the efficiency of the power system and ensuring the quality of the power system. At the same time, the use of electronic information technology can also strengthen the power system detection function, so that the power system can quickly complete the cleaning and maintenance work within a certain time, make the power system stable operation, and ensure that the power system can be more standardized and standard operations.

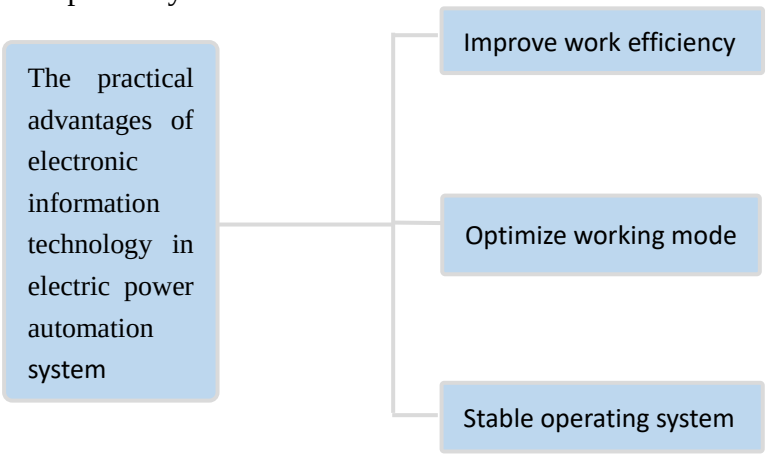

Fig.1 The Practical Advantages of Electronic Information Technology in Power Automation Systems

4. Application Strategies of Electronic Information Technology in Power Automation Systems

4.1 Application Strategy of Distribution Network Automation Technology

The distribution network mainly includes cable equipment, overhead line equipment and distribution transformer equipment, etc., occupying an important position in the power automation system. In the process of managing the distribution network, the usual staff can usually only adopt the traditional manual management mode to manage the work. This kind of management method has strong uncertainty and high risk. At present, under the premise of cooperation between electronic information technology and electric power automation system, the distribution network has realized automation and systematic management. Staff can query and monitor the operation of the distribution network systematically, and can flexibly choose the management mode during the management process. , Such as offline management mode and online management mode, a higher degree of freedom. In addition, the distribution network automation technology also has decentralized control performance, that is, the decentralized control system is connected to the bus, the anti-test device is installed in the switchgear, and the macro control loop is controlled by multiple computers, and the computer operation center can control the collected control. Information and specific parameters are fed back to the lower-level computer console to achieve decentralized management of the distribution network.

4.2 System Automation Technology Application Strategy

In the power automation system, the operation of the system automation directly determines the degree of automation of the power system, which is an important technical guarantee for the

effective implementation of automatic operation of the power system. Therefore, on the one hand, in the actual operation process, the staff should make full use of electronic information technology to optimize the service performance of the power system, increase the speed of power system automation, and strengthen the standardization and standardization of the power system; on the other hand, improve the power system Intensity, according to people's electricity demand, increase investment in electronic information equipment in a timely manner. At the same time, we must formulate strict, standardized and standard operating procedures, and put forward high requirements and high standards for the staff, and strive to improve the ability of the staff to operate the power automation system to lay the foundation for the next power production. In addition, to further meet the needs of power system automation, workers can achieve their goals by collecting power system data, analyzing power system data, and sending power system data. This method can not only improve the accuracy of power system data information, but also reduce Labor costs, to avoid problems such as system failures, improve the stability of power automation systems.

4.3 Application Strategy of Power Dispatch Automation Technology

Electric power dispatching refers to the scientific and rational distribution of electric energy in the electric power automation system to make the electric power system operate stably. The main function of power dispatching is to dispatch electrical energy to ensure the standardization and accuracy of the operation of the power automation system, so as to meet people's demand for electricity. In the actual operation process, the operation of power dispatching automation technology is relatively complicated, and its functions are mainly reflected in: based on the operation of electronic information technology, after detecting the relevant data of the power automation production system, collecting data and analyzing the overall operation of the power automation system, thus More accurately grasp the operation goals of the power system to ensure that people use electricity normally. In fact, in the power automation system, the staff has limited energy and it is impossible to monitor all day. The application of electronic information technology can effectively improve the supervision performance of the power automation system, realize automatic supervision, and avoid problems such as system failures in time. Strengthen the safety performance of electric power automation systems.

4.4 Application Strategy of Substation Automation Technology

In recent years, the development scale of my country's electric power companies has expanded rapidly. Among them, substation automation technology is gradually being improved and reformed. At the same time, the application of electronic information technology to substation automation systems is the current key research direction of my country's power companies. Under the role of electronic information technology, staff can conduct statistics and analysis through the information data transmitted by electronic information equipment in order to clearly understand the operation of the substation automation system. In the actual operation process, the most important role of substation automation technology is to convert the electrical energy transported by the electric power automation system into high-voltage electrical energy, and then carry out voltage reduction treatment, and finally deliver safe electrical energy for people. Substations mainly include transformers and switches, etc. Combining electronic information technology with them can improve the safety performance of substation automation systems, strengthen the power system supervision system, and reduce labor costs and improve the economic benefits of power companies.

5. The Development Direction of Electronic Information Technology in Power Automation Systems

5.1 Strengthen Equipment Compatibility

With the continuous improvement of science and technology, a great breakthrough has been made in the integration and development of electronic information technology and power automation systems. However, in the actual operation process, the power automation system still

has problems such as incompatibility of equipment, which affects the normal operation of power automation systems. Specifically, in the operation procedure of the electronic automation system, each device is susceptible to electromagnetic interference, causing problems such as crashes or loss of information data of the electronic information equipment, resulting in a leak in the operation of the power automation system. Therefore, in the future development, power companies should focus on strengthening equipment compatibility and improving the efficiency of power automation systems and electronic information equipment.

5.2 Development of Electronic Vision Technology

At this stage, under the rapid development of modern information technology in the social environment, a series of electronic vision technologies, such as video technology and infrared imaging technology, relying on information technology, are widely used in power automation systems, and gradually become important for power systems to process power image information. Technology System. Electronic vision technology replaces traditional manual monitoring methods, realizes automatic monitoring, reduces labor costs, and enhances the efficiency and simplicity of the monitoring system. Based on this, on the existing basis, scientific researchers should strive to develop electronic vision technology and fully apply it to actual work to achieve the intelligent development of power image information processing.

5.3 Increase the Operating Speed of the Power System

From the current point of view, the operation speed of China's power automation system is not fast enough, and the performance of power equipment is not strong. Information processing delay problems often occur. This will affect the overall normal operation of the power automation system, delay work schedules, and increase production costs. The main reason for this problem is that the electronic information technology is not perfect enough. Therefore, in order to further deepen the cooperation mode of electronic information technology and electric power automation system, relevant technical researchers should pay attention to the optimization and improvement of electronic information technology, increase the speed of electronic information technology information processing, and enhance the operation speed of electric power automation system.

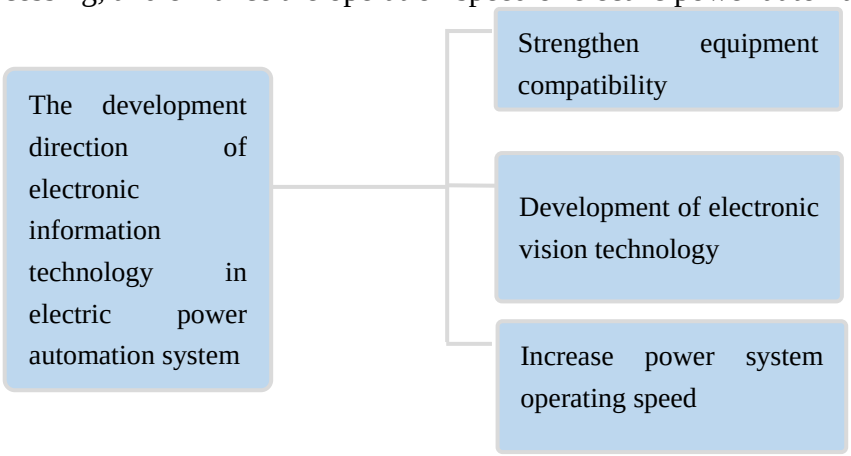

Fig.2 The Development Direction of Electronic Information Technology in Power Automation Systems

6. Conclusion

In summary, electronic information technology is the fundamental basis for the long-term development of electric power automation systems, and the application of electronic information technology in electric power automation systems is directly related to the future development trend of electric power automation systems. It can be said that the use of electronic information technology is electric power automation The fundamental way of sustainable development of the system. Therefore, in the actual development process, electric power enterprises should fully pay

attention to the application of electronic information technology, understand the basic connotation of electronic information technology, master the relationship between electronic information technology and power automation systems, and then according to the actual development of the enterprise and social development needs Scientific use of electronic information technology meets the development needs of all sectors of society in all aspects. At the same time, it is necessary to continuously optimize the automatic power system to make it more scientific, standardized and standardized.

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