Research on the Design of Electrical Automation Control System Based on the Application of Computer Technology

Wei Chen1,*, Yujie He2, Qianqian Pei3
1School of Mechanical and Electrical Engineering, Yunnan Land and Resources Vocational College, Kunming, China, 652501

*Corresponding author e-mail: chenwei@ynghtxy.net

Abstract. Electrical automation control system is a widely used system. With the development of computer technology, electrical automation control system and computer technology are combined to effectively improve the intelligence of electrical automation control. Electrical automation is also a very advanced technology.

Keywords: Electrical Automation, Control System, Computer Technology, Intelligence, Principle

1. Overview of computer control systems for electrical engineering and electrical automation

Electrical automation has been widely used in various industries and fields, such as military, aerospace, industry. Electrical automation in China started relatively late. Nowadays, electrical automation is still developing. There are still some problems in electrical automation, such as serious energy consumption. The corresponding managers should innovate constantly, integrate computer control technology, strengthen the monitoring and regulation of electrical system, and ensure the automatic and stable operation of electrical engineering. Nowadays, electrical automation in China is still developing. The application of electrical automation has greatly saved manpower and material resources. The combination of electrical engineering and computer technology is also a key project in the future. The combination of the two greatly improves the degree of electrical automation, computer system intelligence, computer can accurately adjust the system. At the same time, the computer can improve the stability of the whole electrical engineering operation and make the electrical operation more simple and efficient. In addition, it can be combined with other intelligent systems to initially realize the coordinated development of modern intelligent power. The computer control system can save data independently, carry out point-to-point inspection of data, and operate conveniently. To a certain extent, it can reduce the investment of manpower and material resources in electrical engineering and reduce enterprise cost. The proportion of electrical automation control systems used in life is also significantly increased, as shown in Figure 1:
2. Problems in computer control system of electrical engineering and electrical automation

2.1. Higher energy losses in electrical engineering
In electrical engineering, a lot of resources have been wasted, this kind of waste is caused by the nature of work, we can not avoid, and our country has faced with a certain degree of resource shortage. It violates the basic theory of sustainable development and strengthens the capital cost of electrical enterprises, which is not conducive to the long-term and stable development of enterprises.

2.2. Low integration of electrical systems
At present, the electrical system is still in the process of continuous development, the degree of automation is also constantly improving, the level of electrical automation in different enterprises is different, the information in the process of communication is not compatible, and the real resource information sharing can not be realized. The computer control system is not comprehensive enough, the electrical automation system can not be scientifically integrated together, once the software is upgraded or exchanged data, the compatibility degree is not enough, and the overall work efficiency is low.

2.3. Quality of electrical engineering not up to standard
In addition, there will be accidents in the process of operation of electrical systems. There are many unexpected factors in the actual operation of electrical systems, and the corresponding managers are not familiar with the basic operation management consciousness of the computer and can not effectively apply the computer control and monitoring system. In addition, the transfer of material personnel in the process of electrical power construction is unreasonable, and the code of operation is not observed in the construction process. The moral quality of related personnel is not high, causing major safety accidents.

3. Application of computer control system for electrical engineering and electrical automation
Computers are now widely used in all aspects of people's lives. Computers have become an irreplaceable part of people's lives. Computer technology has been widely used in many industries, and electrical automation has begun to be combined with computer technology, electrical systematic is as shown in Figure 2.
3.1. Introduction of data to reduce energy loss
In the continuous progress and development of technology, the combination of electrical engineering and computer technology is also a very important project. Computing technology can bring many benefits to electrical engineering, and can effectively reduce the energy consumption of equipment. Achieve sustainable development, but also effectively alleviate the energy pressure in China. We can use the computer control system to carry on the inspection in time, fill in the safety report after qualified, after the quality reaches the standard, we can carry on the next step work. Enterprises can introduce big data calculation, continuously optimize the energy saving design in line innovation electrical engineering, and effectively reduce energy loss. In the process of design, designers can use some components with small resistance, which can effectively restrain the loss of transformer. Can guarantee the user's electricity safety. We should carry out a comprehensive inspection of different batches of materials, we should ensure that the lines are intact, fundamentally solve the problem of excessive energy conversion efficiency, and ensure the stable development of enterprises.

3.2. Implementation of integrated control.
What is electrical automation? Electrical automation is to make use of computer technology to make electrical engineering have a unified automation system. At the same time, as a work manager, we should actively introduce advanced technology to improve the automation degree of electrical engineering. In this way, we can effectively save manpower and material resources, at the same time, administrators should actively improve the management concept, can adopt some advanced management concepts, actively complete the automatic development and application of electrical engineering, and realize the mutual sharing between resources and information. To ensure the sustainable development of electrical engineering in China. Electrical automation control can accurately judge the transformer circuit, effectively solve the circuit fault, and realize the dynamic detection of the whole electrical engineering. Operators should fully mobilize their subjective awareness and improve the integration level of electrical automation to further complete the compatibility of electrical engineering.

DCS distributed control system can be introduced, which can help us to complete integrated management. This system can be effectively combined with computer software to form an overall information management. We can input the data of electrical engineering into the model, split, count and contrast different data through computer control system to form a complete data sharing platform. Adopting big data calculation method can help to resist the influence of material price change and maximize the profit of electrical engineering [1].

Figure 2. Electrical systematic drawing.
3.3. **Forming a data-based management mechanism**

The knowledge involved in electrical engineering is very extensive, including extensive professional knowledge. The application of computer technology can successfully replace manpower and material resources, avoid errors caused by manual operation and improve the overall quality of electrical engineering. Enterprises should train foundation construction personnel regularly to help them establish responsibility consciousness and safety management standard.

4. **Application of computer control system for electrical automation**

4.1. **Application in Microcomputer Monitoring System of Air Compression Link**

Electrical engineering is also used in air compression. We all know that air may be affected by external factors in the process of compression [2], and the data obtained are not accurate. PLC technology can effectively solve the above problems, can calculate the internal temperature, pressure and other important data in time, to ensure the accuracy and practicability of air compression data [3].

4.2. **Road traffic systems**

At ordinary times, the traffic lights we see in our life are also the result of PLC control. After entering the traffic system, electrical automation technology has made a great contribution to the development of transportation. PLC can completely replace the toll station and traffic light system, ensure that the traffic personnel can use the remote control of the signal, realize the unmanned management, improve the traffic flow of the highway, and promote the overall development of the highway traffic. The use of electrical automation enables traffic lights to achieve automatic control, greatly alleviates traffic pressure, and makes a very important contribution to the development of China's transportation industry, not just traffic lights. Many electronic products around us use electrical systems, which are inseparable from our lives. Electrical system brings us a lot of convenience in life, and helps people to live [4].

4.3. **Circuit breaker control applications**

In power plants, we can see a common element, that is, circuit breaker, circuit breaker is a very important element, can effectively improve the safety of the circuit. However, due to the large number of electromagnetic components in circuit breakers, the application of PLC system in circuit breakers can ensure the correspondence between input and output, and reduce the difficulty of maintenance. The degree of electrical automation in our country needs further development. This technology will be used in many industries in the future. Electrical automation has been widely used in all aspects of our lives. Our life has been inseparable from electrical automation, such as washing machines we usually use, or roadside traffic lights are used in electrical automation systems. The combination of computer technology and electrical system brings faster development to electrical system [5].

5. **Summary**

Through the elaboration of this article, we also understand the electrical automation system, the perfect combination of computer technology and electrical engineering has greatly improved the efficiency of electrical engineering, and laid the foundation for the development of many industries. Electrical automation is still in the process of continuous development, the future system will be more intelligent, accurate. At the same time, in electrical engineering, relevant managers should also actively introduce advanced technology and management concepts. In the future development process, the degree of intelligence will continue to improve, scientific research personnel should continue to work hard to improve the level of technology development, for the future development of electrical appliances industry in China laid the foundation [6].

**References**

[1] Luo Feng. Analysis of Computer Control System for Electrical Engineering and Its Automation
[2] Analysis on Application of Computer Control System for Liu Wentao, Electrical Engineering and Electrical Automation [J]. Information and Communications ,2019(01):199-200.

[3] Zhang Bo. Application of Computer Control System in Electrical Engineering and Electrical Automation [J]. China equipment Engineering ,2019(06):183-184.

[4] Fan Fangyuan. Application and Analysis of Computer Control System for Electrical Engineering and Electrical Automation [J]. Information recording material 20(06):120-121.

[5] Application of Computer Control System for Electrical Engineering and Electrical Automation [J.] by Yang Weibin Computer programming skills and maintenance 2016(16):50-51.

[6] Tao Hongchun. Application of Computer Control System for Electrical Engineering and Electrical Automation [J.];2 Industrial Design ,2017(04):188.