Application of Electrical Engineering and Automation Intelligent Technology in Building Electrical

Huang Yuejuan

Harbin Huade University,Harbin, Heilongjiang Province,150025;Email:154311305@qq.com

Abstract: In the construction engineering system, electrical engineering plays a very important role. In recent years, the level of science and technology in China has been continuously innovated and developed, and has been widely used in various fields of people's production and life. The electrical automation and intelligent technology of construction engineering are the inevitable development trend. As a product of the development of science and technology, the intelligent technology of electrical engineering automation realizes the organic combination of various technologies, and improves the overall level of building electrical engineering.

Key words: Electrical Engineering, Automatic intelligent technology, Building Electricity

At this stage, with the advent of the "Internet plus" era, most industries in society have entered the road of information and intelligent reform and development. Electrical engineering has strong systematicness and specialty, and is one of the key links in construction engineering. The application of intelligent technology improves the overall automation and intelligence level of the construction electrical industry. Combining the theory and practice of intelligent technology, the construction quality and efficiency of building electrical engineering will be promoted, and a solid foundation for the future development of the construction electrical industry will be laid.

1. Electrical engineering and automation intelligent technology

(1) Electrical engineering

The so-called "building electrical engineering" refers to the project which is carried out around the power resources, electrical equipment and electrical technology to create, maintain and improve the sound, light, heat and other building environment. Generally speaking, the construction system of building electrical engineering includes three parts: power equipment, power line, control and protection device. Each system has division of labor and forms a whole, and supports the supply, transmission, distribution, utilization, monitoring and guarantee of power resources in the process of building operation and utilization.

(2) Intelligent technology

In the application field of building electrical engineering, intelligent technology can also be called "artificial intelligence technology" or "automation technology". It mainly uses modern technology support such as high-precision sensor and big data algorithms to realize recognition and acquisition of language, image, temperature and other real-world elements information, and then dynamically control the operation state of the building electrical system. The optimal solution of the adjustment of the power equipment, the power line and the control and protection device is found.

2. Advantages and characteristics of electrical engineering and automation intelligent technology in building electrical applications

(1) Improve the whole process of building electrical monitoring management

Once the electrical system of a building fails, it will not only affect the operation and service quality of the building, but also cause serious disaster accidents, which will cause huge safety threats and economic loss to construction users. Therefore, it is necessary to supervise and control the performance of various equipment, lines and devices. But in the traditional period, architectural electrical engineering has strong artificial characteristics in design, construction and maintenance. On the one hand, the internal quality of relevant personnel, such as working status, technical level and responsibility consciousness, will be directly linked with the quality of building electrical system, which is not conducive to the accurate and scientific implementation of relevant control behaviors. On the other hand, due to the limited number and energy of relevant personnel, the risk investigation, maintenance, equipment adjustment and other control work of building electrical system are carried out according to specific cycle. At this time, once the electrical failure occurs in the "blank period" between the two cycle activities, it will be difficult to deal with it in a timely and comprehensive way, which is not conducive to the overall operation safety of the building. After the application of intelligent technology of electrical engineering automation, the above negative situation can be effectively contained. In intelligent building electrical systems, a large number of current, voltage, temperature, image, voice and other sensor equipment are arranged. Under the application background of continuous supply of power resources, it can collect information all day and dynamically, and transmit the collected equipment, lines, devices and other information to the control platform through wireless communication and optical fiber communication. It provides the basis for the following automation and intelligent control behavior. In this way, the "blank period" influence under the traditional artificial mode can be effectively eliminated and the whole process supervision of the building electrical system can be realized. On this basis, the control platform system located in the control center layer can analyze the electrical information returned by the sensor based on modern science and technology such as big data mining technology, big data prediction technology, neural convolution network technology, and compare the analysis results with the preset standard value. After that, if the actual value reaches or exceeds the limit, the system will quickly formulate the adjustment scheme of equipment, line and device, and send feedback signal to control the building electrical system to return to a stable and reliable state.

(2) Improve the accuracy of electrical monitoring management in building

In the construction engineering system, the electrical engineering of building has strong concealment characteristics. On the one hand, most of the power supply and distribution lines and electrical equipment are not directly exposed to the external environment, which makes it difficult for relevant personnel to find the abnormality in time in the process of building use or management; On the other hand, many important parameters in the building electrical system are invisible, such as current, voltage, line load, resistance value, etc. When collecting and analyzing such parameter information, relevant personnel must carry out work practice with the help of multimeter, ammeter and other professional testing equipment. Under the influence of these two aspects, the traditional manual control mode of building electrical systems is difficult to ensure accuracy. At this time, through the construction of intelligent and automatic building electrical control system, the information collected by the sensor, such as current, voltage, resistance and load, can be converted into digital signal through scientific signal conversion technology, and quantified in the corresponding platform interface for relevant personnel to directly view. At the same time, the intelligent characteristics of the automation intelligent technology of building electrical engineering are also reflected in its integration of existing information resources and prediction of future information trends. In the visual interface of the management platform, the relevant personnel can see the change curves of power supply and distribution trend, equipment parameter fluctuation and so on in the electrical links of the building in the past period, so as to form a comprehensive understanding of the operation state of the building electrical system combining macro and micro. In addition, combined with the big data algorithm, the law analysis of various change curves can be carried out. The intelligent system and

related personnel can also predict the parameter trend of the building electrical system in the future period, so as to realize the scientific consideration of the probability of equipment failure and electrical disaster, and formulate effective fault avoidance and disaster prevention scheme. Thus, even if the building electrical system is abnormal under the condition of no control, the intelligent control center can quickly complete the actions of closing the electrical valve and breaking the electrical line according to the pre-determined risk response procedure, control the failure impact at a lower level and send corresponding alarm signals to the staff.

(3) Improve the linkage of building electrical monitoring management

The electrical system of building has a strong linkage operation characteristic. Once a certain electrical equipment, control protection device or a certain section of electrical circuit fails, it will easily cause domino effect, which will gradually cause the overall block or even paralysis of the electrical system, and then lead to power failure. Therefore, it is difficult to achieve the effective treatment effect if the single equipment or single section line is controlled and adjusted after the fault occurs. Under the background of the application of intelligent technology of electrical engineering automation, the building electrical system body, sensor equipment and intelligent control center can be connected into a collaborative operation and mutual influence of the Internet of things. In this way, once a system link has a running situation, while being controlled and adjusted, other related equipment, devices and lines will be transferred accordingly, so as to eliminate the influence of faults in multiple points and comprehensively, so as to ensure the safe and stable operation of the building electrical system. In addition, with the continuous development of modern construction industry and electrical intelligent technology, various intelligent equipment and control technologies with different functions emerge endlessly. It can be incorporated into the construction of the Internet of things system of building electrical engineering, which can trigger multiple linkage protection mechanisms at the emergency point, and avoid and deal with the hidden dangers for the first time. For example, intelligent fire spray system, smoke alarm system and high temperature alarm system can be designed in building electrical engineering, and the relevant sensing devices and security equipment can be arranged in the environment of distribution room and lighting area, so as to form a hidden protection network and achieve ideal electrical fire control effect.

3. Application analysis of electrical engineering and automation intelligent technology in building electrical

(1) Automatic control

With the increasing attention of people to construction engineering, building electrical engineering as an indispensable and important content has been paid great attention to. It is different from traditional architectural engineering design. In the process of modern construction engineering construction, it is necessary to combine the architectural electrical system to realize the mutual relationship between construction engineering and electrical engineering. That is, the common neural network control automation system. In the automatic control system, the system adjusts and optimizes itself according to the set parameter subsystem. The whole system enriches the form of automatic control by using intelligent technology. Taking the PID controller as an example, this controller replaces some control systems, which can assist other systems to develop specific equipment and simulate the process of automatic control. Taking residential buildings as an example, the electrical energy saving in the building is calculated in the network system by using the automation intelligent technology. Through the network evaluation simulation and result analysis, we take practical and reasonable electrical energy saving measures to formulate the electric energy saving scheme, so as to ensure the best effect of the electrical energy saving design applied to the building. In addition, the heating and air conditioning system in residential buildings can optimize the heating system and ensure good heating effect by means of automatic intelligent technology while providing normal heating service for people. Meanwhile, it emphasizes its energy saving, and finally achieves the energy saving purpose by adjusting frequency conversion through scientific calculation.

(2) Real time monitoring

The construction and construction of construction projects has the characteristics of long cycle and large-scale complex systems. The intelligent technology can be used in the real-time monitoring system to realize the continuous and non-dead angle monitoring of construction projects. With the advanced intelligent monitoring system, the construction site of the construction electrical engineering can be monitored in real time and the monitoring data can be transmitted to the project management personnel in real time. It broke the time and space restrictions. Judge the possible emergency and accident problems in time, and formulate effective solutions to avoid leakage, water leakage, stealing work and reducing materials. Intelligent monitoring systems are used in the buildings of parking lots and other places. On the basis of intelligent and automatic, each parking space can be monitored by light sensitivity. When there is a vehicle parked in the parking space, the automatic intelligent system can receive signals, automatically identify the vehicle information and transmit it to the interactive interface. Users can quickly find parking spaces through the interactive interface, to achieve the ultimate goal of reducing carbon emissions, saving gasoline resources and protecting the ecological environment. The intelligent electrical appliances can be applied to facilities such as natural gas valves and electric gates by using electrical engineering and automatic intelligent technology, and the functions of intelligent monitoring system can be improved. Through real-time monitoring and monitoring, natural gas leakage and electricity stealing can be avoided. When there is any abnormal problem, the system can alarm in time and take corresponding measures.

(3) Intelligent management of building power supply and distribution

As an important part of the construction project, the power supply and distribution system provide power support and power supply guarantee for the operation of various facilities and equipment. Intelligent technology can be used to monitor the power supply and distribution system of the building in real time, and the power consumption of each household in the area can be automatically counted and the adjustment work shall be carried out when appropriate. The intelligent distribution system has strong automatic detection function, can detect safety problems such as short circuit and leakage in time, and strengthen the security and stability of the building power supply system. The application of automation and intelligence technology provides perfect technical guarantee for the modernization of building electrical engineering, detects the fault problems quickly, reduces the time of putting into operation in the construction electrical engineering by manual means, reduces the economic loss and cost investment that may be generated by building electrical engineering, and uses the automation intelligent technology. It ensures that the construction project meets the requirements of relevant quality standards.

Concluding remarks

In a word, electrical engineering and automation technology have been widely used in building electrical, which makes building electrical more safe, reliable and can only improve the integration and efficiency of building electrical engineering systems.

reference

[1] Lizhiqing. Application of intelligent technology in building electrical engineering [j]. Real estate, 2019 (15): 134

[2] Wang ruiran. Application of intelligent technology in building electrical engineering [j]. Industrial Science and technology innovation, 2019,1 (21): 76-77