



Discussion on the Application of Intelligent Technology in Mining Electrical Engineering Automation

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Abstract

Science and technology are updating at a faster pace, and China's power industry is also developing in a better direction. The scale of the power system is getting larger and larger, and the system operation mode is becoming more and more complex. Adding intelligent technology to the automation of coal mine electrical engineering can ensure a more stable operation of the power system and further improve the level and quality of power supply. Therefore, this article mainly analyzes the application of intelligent technology in the automation of mine electrical engineering, hoping to provide some reference and help in helping coal mine enterprises obtain more comprehensive benefits.

Keywords

Mining electrical engineering; Automation; Intelligent technology; Application

As we all know, during the development period, each enterprise can achieve better development and further improve its development level by applying more advanced technologies. Adding intelligent technology to coal mine electrical engineering automation can lay the foundation and provide assistance for improving the development level of enterprises. It can also solve the problems existing in traditional automation control, improve the efficiency of coal mine production, and save more expenditure costs. Based on this, this article mainly discusses the application of intelligent technology in mine electrical engineering automation.

1. The Meaning of Electrical Engineering Automation

What is electrical engineering automation? It is mainly to better integrate various aspects such as electronic computers, electronic technology and integrated networks, and finally form a discipline with comprehensive characteristics. Electrical engineering automation has been applied in many fields and is closely related to people's daily life and work. Especially in the industrial field, it is used more prominently and plays an irreplaceable role in improving industrial production efficiency and other aspects. Moreover, electrical engineering automation courses have been set up in major colleges and universities. The main purpose is to cultivate batches of compound talents with high comprehensive quality, strong working ability and high level of professional engineering and technical knowledge. Students learn the knowledge of electrical engineering automation and apply it to the practical process to help enterprises solve problems in electrical engineering technology. With the continuous passage of time, my country's social economy has accelerated its development speed, and the level of industrialization is also improving. The application of electrical automation technology can provide support for industrial development.

2. Intelligent Technology Research

In the future social development process, intelligent technology will play a very important role. Through the use of artificial intelligence technology, it can help power engineering data to be intelligently mined and processed, and the work efficiency can be significantly improved, providing support for the better development of various industries. By adding intelligent technology to the product, relying on the already input logical thinking mode, the logical ability of the product can be significantly improved, and the actual functions of the product can be continuously increased. Intelligent technology is a new technology that follows the pace of the times, and it will play a role in promoting the development of various industries.

3. The Importance of Applying Automation Technology in Coal Mine Electrical Engineering

3.1 Improve work efficiency

Through the scientific application of intelligent technology in coal mine electrical engineering, there is no need to use the traditional manual data input mode as in the past. Because the traditional mode of manual data input is very backward and easily affected by various factors, various problems occur, and the efficiency of data processing is greatly reduced. By applying intelligent technology, problems such as long manual work and easy errors can be solved, and the requirements of automatic control can be met. In addition, in coal mine electrical engineering, the application of intelligent technology can also reduce the workload of relevant staff. Intelligent automatic control technology uses self-adjustment to form an unmanned control system, which greatly improves work efficiency.

3.2 Improving control accuracy

As we all know, electrical equipment is very complex and includes many contents. Only by using high-tech scientifically can the working performance be improved. Real-time monitoring of the actual working of the equipment can ensure that the electrical equipment can operate more smoothly. Artificial intelligence technology can play its role and can completely collect and process information in an automatic way to ensure that the collected information is more accurate. The biggest feature of adding intelligent technology to coal mining enterprises is that it can help adjust the control accuracy of coal mine electrical engineering and ultimately present better control effects.

3.3 Achieving remote control goals

The commissioning of mine electrical automation system is one of the most obvious advantages and characteristics of the automation system. It plays an irreplaceable role in the specific application process. By analyzing from the perspective of work, it is found that it fully meets the requirements of the electrification production process. The automated control comprehensively monitors the operation of the equipment, and adjusts the equipment parameters based on intelligent technology to ensure that the equipment can run more smoothly during operation. Compared with the traditional manual adjustment method, intelligent processing and adjustment are more accurate and do not require more cost.

4. Problems in Traditional Electrical Engineering Automation

4.1 Problems in troubleshooting

An analysis of traditional electrical engineering automation control systems revealed that the biggest problem is risk. During troubleshooting, workers are easily affected by a variety of factors, and there are unreasonable areas when formulating preventive measures, which may even have a serious impact on mine electrical automation.

4.2 Low level of automation

It is very difficult for traditional electrical engineering automation to truly achieve electrical engineering autonomy, and its application scope is not very wide. However, by adding intelligent technology to electrical automation, the goal of autonomy and automation can be truly achieved.

4.3 Problems with the ventilation system

As we all know, mining engineering is an underground operation. The working environment faced by workers and related equipment is particularly complex, and can even be described as harsh. Therefore, in order to create a better working environment for workers, a good ventilation system is very important. However, in the past work, there have always been problems with the ventilation system, which affected the normal operation of the workers.

5. Application of Intelligent Technology in Mine Electrical Engineering Automation

5.1 Application in product design

Complexity and professionalism are the main characteristics of coal mine electrical engineering automation systems. Especially in electrical engineering automation systems, when designing sensor products, practical operations are particularly complex and difficult, and many high requirements are put forward. In order to help coal mining enterprises obtain more economic benefits, it is necessary to further improve the efficiency of electrical equipment production, and intelligent technology can be added to the design process of enterprise electrical engineering products. In addition, in the process of product production and design, more human resources are required. At this time, it is necessary to avoid the adverse effects of human factors on product production and design. Because of the differences in staff, his work experience and work ability are high and low, and there are also great differences in many other aspects. If the ability of the designer is weak, then there will inevitably be problems with the design effect, and it will be particularly difficult for coal mining enterprises to truly achieve rapid development. Therefore, it is necessary to combine the requirements of coal mining enterprises for products, reasonably apply intelligent technology, collect relevant data and information, and ensure that the product has strong reliability in its production process.

5.2 Application in fault diagnosis

In coal mine electrical engineering, all the equipment used has refined characteristics. Electrical engineering works continuously, and related equipment also needs to run 24 hours a day. With the continuous increase in working hours, the possibility of equipment problems increases. In the traditional fault solving mode, the staff all rely on their own work experience to find the problems and the location of the problems. The operation and maintenance staff need to enter the equipment maintenance and inspection process in a regular manner. However, because the quality and work ability of the staff are uneven, in some cases, there is no way to analyze and judge the fault more accurately, which has a lot of impact on the normal production of coal mines. However, by adding intelligent technology to the fault diagnosis of mine electrical equipment, the advantages highlighted are particularly obvious, that is: the reasonable application of intelligent technology can find the problems of electrical equipment and the main reasons for the problems as quickly as possible, and then send the relevant information to the operation and maintenance staff, laying the foundation for better and more scientific problem solving.

5.3 Application in ventilation system

Because coal mining is very complex and the working environment of the workers is particularly harsh, they are likely to be affected by many factors and encounter dangerous problems. Therefore, an excellent ventilation system is very critical and important and cannot be ignored. In addition, a good ventilation system can also create a better working environment for the workers. If you want to optimize the ventilation conditions in coal mines, you also need to rely on the use of intelligent technology to build a more complete ventilation system, fully integrate various technologies, and ultimately present a better ventilation system use effect, ensuring that the ventilation system in coal mines can be safer and more stable during operation, and reduce and reduce the possibility of risks.

5.4 Application of optical protection association in coal mine electrical engineering

By adding optical interconnection technology to electrical engineering, this technology can play its role (higher interconnection level, widespread network access, etc.), which can lay a foundation for the better development of electrical engineering. Optical interconnection technology, combined with the automation control of electromechanical systems, can strengthen the management of coal mining enterprises in the development process, further improve the level of enterprise management, and avoid the impact of human factors during the development of enterprises, which

may lead to problems. Not only that, optical interconnection technology has strong anti-interference ability. Compared with other technologies, optical interconnection technology will not be easily affected by external factors, and plays an important role in steadily improving the speed of power information transmission.

5.5 Application in coal mine safety monitoring

Because the production conditions in coal mines can be described as "bad", the possibility of problems is very high. Therefore, it is very necessary to carry out safety monitoring work, mainly relying on the intelligent safety management auxiliary mode to build a safe intelligent monitoring system to escort the safe production of coal mines. The safety monitoring system can give full play to the advantages and characteristics of intelligent technology, become the most effective "assistant" for relevant managers, help them to bring more accurate and real data reports, and lay the foundation for the high-quality development of coal mine safety management. Under the background of the new era, large-scale coal mining enterprises will use telemeters, infrared automatic sprayers and other equipment in the process of development. All of these equipment have one feature, that is, they are highly advanced. Advanced electromechanical equipment can carry out comprehensive supervision and control of the entire process of coal mine production, which is conducive to maintaining the safety of coal mine production. For example: In order to complete the coal production task more efficiently, a coal mine began to build an intelligent demonstration mine, implement intelligent upgrading and transformation in key areas, and help mines to produce efficiently; deeply promote intelligent risk pre-control, help mines to produce safely; promote the application of clean and energy-saving technologies, and help build green mines. The intelligent upgrade of Shangwan Coal Mine promotes the high-end, intelligent and green development of the manufacturing industry. In the narrow underground passage, more than a dozen computers are placed on a workbench. The director of the electromechanical information center of Shangwan Coal Mine said that this is part of the intelligent construction of the coal mine. The staff can directly see the operation of coal mining equipment such as coal mining machines and hydraulic supports on the monitor, and can also remotely control the equipment through the computer.

5.6 PLC technology

What is PLC technology? It mainly refers to programmed logic controller. It is widely used in power system automation. In the context of the new era, traditional and complex switches can no longer meet the requirements of the development of power system automation. For this reason, PLC came into being and appeared in front of people, gradually replacing traditional switches. The application of PLC technology can not only control the process flow, but also greatly improve the level and efficiency of work, and ensure a more accurate power supply system.

5.7 Intelligent control technology

Intelligent control technology is a new technology that follows the development of the times. It can truly achieve the goal of completing automated operations without human control. Mechanical equipment simulates the thinking mode of the human brain, which significantly improves the control quality of electrical control systems and also makes electrical engineering automation intelligent technology valued and widely used. Especially when facing highly dangerous work, intelligent robots can successfully complete related tasks and reduce costs, ultimately achieving the goal of achieving comprehensive benefits.

6. Conclusion

In short, the speed and pace of coal mine electrical engineering automation technology has been accelerated, and intelligent technology has been applied in many industries and fields. The full integration of the two can effectively solve the problems existing in the development process of coal mining enterprises, prevent human factors from having an adverse impact on work efficiency, and save more manpower costs, helping coal mining enterprises to obtain more comprehensive benefits in the development process. In addition, the scientific use of intelligent technology can also help relevant staff quickly and timely discover problems with electrical equipment, and then arrange professional fault personnel to quickly enter the equipment problem solving process to help the equipment quickly return to a healthy state, and continue to help coal mining enterprises to better develop.

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