

Application and management analysis of coal mechatronics engineering technology

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Abstract: In recent years, with the continuous development of our country's social economy, the competition between different industries has become more and more intense. By relying on mechatronics technology, coal mining enterprises can significantly improve technical production efficiency, reduce the costs of media enterprises in the production process, improve the strain capacity of products, save more non-renewable energy and material consumables, and achieve greater coal economic production goals. The coal production system is operated by various electromechanical production equipment. With the acceleration of the replacement of mechanical and electrical production equipment, the coal production system has become more and more advanced, and has achieved a certain degree of technological innovation and effectiveness. This paper discusses the application management of mechanical and electrical integration technology in coal mine, and will conduct research from the perspective of the application of mechanical and electrical integration technology in coal mine, combined with the needs of coal mine production, and put forward some feasible improvement countermeasures to provide more good strategies for achieving better production and economic benefits, so as to continuously reduce pollution and loss and maximize the benefits of comprehensive coal production and management.

1. Introduction

With the rapid development of modern science and technology, mechatronics technology has been widely used in coal mine production. Thanks to the high development of the technology, the production efficiency of coal mines is becoming faster and faster, and the development of mechatronics technology is also due to the development of science and technology and the upgrading of technical systems, and the continuous development of green environmental protection and modularity, high precision, high speed, high flexibility and direction. Although at present, China's mechatronics technology development speed is relatively rapid, technology is becoming more and more advanced. However, compared with the advanced level of Japan, the United States and Germany, there is still a relatively large technical gap. In the context of the continuous transformation of social technology in China, we should always adhere to the application of advanced technology as a new direction of development, constantly optimize the ability and level of technological innovation, train more professionals and technical experts who can engage in mechatronics, and support the development of more mechatronics enterprises, in order to continuously promote the application and innovation of mechatronics technology and production capacity in our country. In the context of the concept of a conservation-oriented society, more and more coal enterprises have realized the importance and indispensability of achieving efficient production, which is a new production option to replace the traditional electromechanical production mode. Therefore, it is of great significance and value to strengthen the research on the application management of mechatronics technology in coal mines, and at the same time, it can also realize the application and development of mechatronics technology for the vast number of coal mine enterprises, so as to provide more development suggestions.

2. The role of mechatronics engineering technology in coal production

In recent years, China's social economic development has become very rapid, while social production efficiency has also been greatly improved, to meet the majority of people's life and consumption needs, and in this context, China's coal resources have become increasingly nervous, in order to meet the social and enterprise development of the huge demand for coal, it is necessary to constantly increase the production capacity and efficiency of the media [1], however, In such a rapid and efficient development situation, the quality of coal production becomes difficult to ensure, and it is also very easy to cause major technical and safety accidents. In this way, it will seriously threaten the life and property safety of production personnel and the production efficiency of enterprises, resulting in counterproductive effects. In this case, this is to avoid the emergence of various problems in production. At the same time, the application of mechanical and electrical integration products in coal mine production can carry out efficient and environmentally friendly production through the use of this technology, which can minimize the complicated coal production and management process and production intensity of the enterprise, and carry out comprehensive control over coal production, thus minimizing the occurrence of enterprise safety accidents. We need to continuously improve the production capacity and efficiency of China's social coal, so as to achieve better social and enterprise economic benefits and value.

3. Application analysis of coal mine mechatronics engineering technology

The technology of mechatronics in coal mine has been widely used in the field of coal production, and has become one of the important means to improve the efficiency of coal production. This also provides a good development opportunity for the innovation and development of coal mine mechatronics technology, and how to improve mechatronics technology becomes more and more urgent [2].

3.1 Coal Mine Safety Production Monitoring System

Mechatronics technology mainly involves three different aspects, including: mechanical, automatic, computer. In the process of mine operation and production, the monitoring system mainly monitors the work of underground or open-air equipment, if there is a problem in production, it can help the production manager to find some problems in production in time, and fully protect the safety of coal workers to ensure coal mine production and safety. In recent years, with the rapid development and popularization of local area network technology in China, various data in coal mine areas can be highly unified with the host information, and the accumulation of information technology can be completed.

3.2 Coal mines use equipment shearers

The main equipment used in coal mine production is the shearer, which is indispensable. The mining and running performance of the shearer determines the mining capacity and output. Therefore, the mining rate of the shearer affects the economic income of the mining enterprise. Especially after the high application of mechatronics technology, the shearer can achieve efficient traction and prevent the emergence of production resistance to the greatest extent. In addition, after the rapid application of mechatronics technology, the shearer can be well prevented. In the process of coal mining, there is a sudden decline, and even if there is a decline, it can be controlled and adjusted in time.

3.3 Coal Mine Transporter

Coal mine transport machine is an important transportation machine in coal mining, which undertakes the transportation of all coal in coal mines and is the main power supply machine. However, due to the operation of the coal transport is prone to loss. The application of the integrated technology to the coal mine transport machine can significantly improve the transport capacity, can realize the automatic operation of equipment, reduce personnel costs, and improve the operation efficiency and economic benefits of the transport aircraft.

3.4 Belt conveyor

In many modern coal mining enterprises, in order to improve the production capacity of coal, basically the belt conveyor will be used for transmission, and the belt conveyor has many advantages, such as long distance and large throughput, plus the automation level of these transmission equipment is generally relatively high. Therefore, it has gradually become an indispensable important equipment in coal mines. At the same time, it is also necessary to fully take into account the single amount of conveyor transport and the total length of a single machine. In this way, we can truly ensure that the monitoring range and functions of the conveyor can reach the production needs of coal mining enterprises.

4. Problems in the management of Mechatronics Engineering Technology

4.1 The technical management quality of managers is not high enough

As the management personnel technical management quality is not high enough, technical ability is not good, lack of professional ability, education is generally low. As a result, many technical management work implementation and try are not in place. However, on the contrary, mechatronics technology is a professional with relatively high technical requirements. Relevant technical management personnel, not only to have a solid basic knowledge of coal production management, but also need to master a number of different technologies. Such as: automation control technology, etc., which makes the corresponding mechanical and electrical integration technology professionals in coal production relatively accurate. And because many coal enterprises are in cost and management considerations, the introduction of mechanical and electrical integration professionals is insufficient, resulting in some training professional work is not in place, so it will lead to the professional technology is difficult to play its role.

4.2 Technical equipment management is not in place

In the process of coal production and mining, some coal mining enterprises pay more attention to the actual production and ignore the technical equipment management work, so that the aging degree of some technical equipment has become very serious, and in turn will directly reduce the technical production efficiency and level. Some coal mining enterprises are in a high-load production state all year round, and in such a production environment, the relevant technical production equipment has not been replaced in time, resulting in the deterioration of technical equipment management.

4.3 The mechanical and electrical management departments clearly lack a sense of responsibility

Compared with the traditional old coal mining enterprises, modern coal mining enterprises have become more and more advanced, and in order to improve the production efficiency and quality of coal mining enterprises, there are some basic positions of management. However, due to the lack of professional skills training of relevant management personnel in coal mining enterprises, many managers obviously lack a sense of work responsibility, and everything that has nothing to do with themselves is basically managed with a mentality of more than one thing, such as: Some leaders lack the sense of management responsibility, muddle along in the work, only care about promotion, or engage in some things unrelated to production, lack the spirit of enterprise ownership, how the production efficiency of the enterprise has nothing to do with themselves, as long as their salary as usual. In addition, because the technical means of the enterprise are relatively backward, the promotion of management personnel have set the corresponding technical standards, and make the mechanical and electrical management department failed to play the greatest role.

5. Management measures for the application of mechatronics engineering technology in coal mines

5.1 It is necessary to strengthen the professional technical ability training of coal mine enterprises

Although, in recent years, the application level of mechatronics technology in China's coal mining enterprises has been improved and has achieved great development. However, from the reality point of view, the quality of enterprise management personnel is not strong enough. As we all know, whether the quality of the management personnel of the enterprise is excellent is an important basis for its work and one of the important guarantees for coal production. Therefore, in order to ensure the work of mechanical and electrical management personnel in coal enterprises, comprehensive training should be carried out for important and front-line technical backbone personnel in the future coal production, and professional knowledge and technical assessment should be conducted once a month and regular job training should be conducted. When laying a solid technical and professional foundation for different personnel in different positions, To teach them some advanced production concepts, as well as technical application methods, the final is to fully ensure that these personnel in the shortest time, can better master the professional electrical integration operation and management technology. In addition, in the actual production of coal to fully show, strengthen the application of technology, at the same time to gradually develop a good habit of continuous learning and improving self-ability, with The Times, follow the main direction of future technological development, so as to better participate in the field of coal production, single-mindedly serve the coal production operations of enterprises. Moreover, enterprises should continue to increase the recruitment of coal mechatronics technical professionals, and attract more outstanding personnel to join the team. In this way, the production technology and capacity of coal enterprises can be continuously improved, so as to better serve the coal production industry^[3].

5.2 Strengthen the management of mechatronics engineering equipment

As we all know, technical equipment is the biggest key to improve the efficiency and output of coal mining, so we should strengthen the management and maintenance of technical equipment, pay attention to the operation of technical equipment, and replace some old obsolete equipment in a timely manner. In this way, we can fully ensure that the technical equipment can achieve the best operation and working state. At the same time, it is necessary to make reasonable use of technical equipment for production, and in the process of using technical equipment, unnecessary safety accidents should be prevented to the maximum extent, so as to continuously improve the production efficiency and quality of coal mining. At the same time, it is necessary to vigorously establish a set of perfect supervision and management mechanism and system, and repair some technical equipment, and carry out regular inspections of equipment that already has problems. The purchase or repair of some equipment, as well as the update of different links must be supervised and managed, so as to truly realize the whole process of management supervision. In addition, it is necessary to further increase the investment in mechatronics technology, at the same time, it is necessary to continuously strengthen the management of mechatronics technology, and further improve the infrastructure, and ultimately improve the management level of technical equipment, which can really play its due role in coal production and help coal production enterprises better production to ensure the safe conduct and development of coal mining.

5.3 The function of mechanical and electrical management department needs to be strengthened

Without proper protection, on the contrary, it is very easy to cause a series of technical security accidents [4]. This new in the real process of coal mining and production, there is usually a situation of contempt for the motor management department, because of this, so that the implementation of various management work and news reports can understand one or two. Therefore, in the new development environment, if the coal mining enterprises want to improve the safety of coal mine production and improve the application management efficiency of mechatronics technology, then it

is necessary to increase the management of the mechanical and electrical management department, to optimize the technical production management mechanism of the department, it is necessary to establish a feasible technical management program. In order to continuously promote the technical management level and efficiency of this department, the mechanical and electrical integration technical management department should constantly improve its management awareness in coal production, and should strictly engage in relevant technical production work in accordance with relevant requirements to improve coal production capacity and level [5]. In the process of daily production, the department should regularly update the technical equipment system, rationally design the system according to the production requirements and tasks, rationally report the technical parts that are more likely to be damaged in the equipment, check the main factors of the occurrence of safety accidents, and stop the illegal operation of the work. In this way, the application level and ability of mechatronics technology can be improved, which plays an important role in the production of coal, and makes coal production more efficient and efficient, and puts an end to all kinds of technical accidents in time. Especially through the use of mechatronics technology to achieve production innovation, not only can significantly improve coal production capacity, but also its own performance and quality can be improved [6]. At the same time, to a large extent, we also continue to improve the level of coal production and manufacturing, so as to make our country's social labor productivity has been improved. Based on this, it is necessary to further strengthen the functions of the mechanical and electrical management department, optimize the management work, restrict the behavior of production and management personnel, enhance the awareness of safety production, adhere to green environmental protection production as the first concept of production, in order to save more energy, but also to further reduce the consumption of various materials.

6. Conclusion

In recent years, with the continuous advancement of China's social industrialization, the application level of mechanical and electrical integration technology in coal mines has been greatly improved, completely changed the face and situation of coal mine production, and promoted the development of coal mine production in the direction of safety and efficiency. With the continuous progress of society, the social demand for coal is increasing day by day, therefore, we should strengthen the management of coal mine production, especially improve the importance of mechanical and electrical integration technology management, change the previous awareness of equipment management. Although mechatronics technology as early as the 1920s of the last century, it has been widely used in coal mining and production list, but because China's coal mining technology production level is still relatively backward, failed to popularize the technology, thus restricting China's coal production and mining level, but also caused safety accidents. Therefore, in the future, coal mining enterprises should increase the promotion and application of mechatronics technology, and reasonably reduce the relevant links to ensure the operation capacity and level of technical equipment, and build digital and intelligent technology network, improve the application level of mechatronics technology, ensure the safety and stability of mechatronics technology, and better production to satisfy the huge demand of coal resources for our social and economic development.

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