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Original Paper

Optical Fiber Communication Technology and Its Application in Power Communication

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Abstract

In the background of the rapid development of China's power communication industry, the development level of optical fiber communication technology is constantly improving, which reflects the higher application value in the power communication system. Giving full play to the role of optical fiber communication technology can effectively improve the operating efficiency of power communication system, fully meet the actual needs of our people, and provide favorable support for the social development of our country. In view of this, this paper analyzes the application of optical fiber communication technology in power communication, hoping to provide an effective reference for the further development of power communication industry.

Keywords

Light communication technology, Electric power communication, Apply

1. Introduction

In recent years, as the pace of construction of China's power communication engineering continues to accelerate, the operating environment of the power communication system is becoming more and more complex, and it is difficult to complete the scheduled work objectives only by relying on traditional technology, which requires attention to the application of modern technology such as optical fiber communication technology to achieve the purpose of improving the operating efficiency of the power communication system. By deeply analyzing the main advantages of optical fiber communication technology and exploring the specific application of light communication technology in power communication, it can provide some effective reference for relevant practitioners and promote the sustainable development of power communication engineering.

2. The Main Advantages of Light Communication Technology Analysis

At present, the development of the power grid has gradually realized the intelligent application, that is, the so-called smart grid, the important basis of the smart grid is power communication, the use of different types of power communication technology, can ensure the fast, safe and stable operation of the smart grid, frankly speaking, the power communication technology in the smart grid determines the intelligent level of the smart grid to a certain extent From the macro point of view, it can promote the development of domestic power industry. Therefore, in the development process of domestic smart grid, it is necessary to pay attention to the application of power communication technology in smart grid, which is very important for the development of smart grid. However, at present, there are still many shortcomings in the application of power communication technology in the smart grid. Fortunately, the application of different types of power communication technology is in the initial stage, and the existing problems are relatively common. Therefore, in the subsequent development process, it is necessary to pay attention to smart grid and power communication technology, achieve the organic combination of the two, and promote the development of smart grid.

2.1 Strong Anti-electromagnetic Interference Capability

Generally, in the application process of optical fiber communication technology, quartz is mainly used as an insulator material for light information transmission, which has the characteristics of strong corrosion resistance and strong insulation performance. The anti-electromagnetic interference ability of optical fiber communication technology can be brought into full play, which can reduce the impact of lightning, ionospheric changes, and sunspot activities on the power communication system, and also avoid man-made electromagnetic interference, so that the power communication system is in a normal state of operation. At the same time, the technology can be combined with the power conductor, making it a double type of optical cable.

2.2 The Broadband Information Capacity is Large

Compared with other technologies, optical fiber communication technology has the characteristics of larger information transmission capacity and faster information transmission speed, which can fully meet the needs of China's thermal information transmission, so that the overall efficiency and quality of information transmission are guaranteed. With the development of light communication technology, the problem of information transmission in power communication can be effectively solved, which provides favorable support for the efficient operation of power communication system.

2.3 Long Information Transmission Distance and Low Loss

In the operation process of the power communication system, the use of light communication technology for information transmission can not only achieve long-distance information transmission, but also reduce the loss caused by the information transmission process, so that the economic benefits of enterprises can be improved. At the same time, this technology has a strong security, can ensure the security of the information transmission process, so that the information transmission in power communication is faster and more accurate.

3. The Specific Application of Light Communication Technology in Power Communication Analysis

3.1 Optical Fiber Composite Phase Line

The application of optical fiber composite phase line to the power communication system can coordinate the frequency resources, electromagnetic compatibility and lines in the system, and improve the efficiency and quality of the system's information transmission, so that the power communication can fully meet the actual needs of our people. As far as the current situation is concerned, the optical fiber structure can be divided into two parts: armored outer layer and optical fiber unit, which is more suitable for the transmission lines that need to be replaced after aging and the transmission lines that have just been built. Although the use cost of this technology is high, it has strong reliability and can be applied reasonably according to its actual situation.

3.2 Light Composite Ground Wire

According to the development of the previous power communication system, the technology of optical fiber composite ground wire is often used, which can effectively reduce the construction cost of the power communication system, ensure the reliability of the system operation, and no longer need to use a lot of time to maintain it, so that the work efficiency of the enterprise can be effectively improved. General fiber composite ground lines are often used in lines that need to be replaced or have just been built, which can ensure the stable operation of power communication systems. For the application of this technology, the main consideration is that the fiber composite ground wire can be used as a lightning protection line in the line, which has a good positive effect on improving the impact resistance of the guidance, and can realize the effective protection of the transmission line. At the same time, through this technology can carry out efficient information transmission, to achieve the purpose of integrated use of optical cable and overhead ground.

3.3 All-media Self-bearing Optical Cable

Compared with the traditional technology, the all-dielectric self-bearing optical cable has stronger load-bearing performance, which can effectively reduce the influence of external load on the power communication system. In order to give full play to the functional utility of all-dielectric self-bearing optical cables, it is necessary to select optical cables with high mechanical strength and use all-dielectric materials to ensure that the ability of optical cables to withstand current meets the requirements and is easy to work normally in high voltage and strong current environments. In view of the current situation, the application effect of this technology in power communication is good, which can use high-voltage transmission poles to complete the construction of power communication networks, and can also be laid with other transmission lines at the same time, improving the efficiency of engineering construction and reducing the cost of engineering construction.

3.4 Modern Light Transmission Networking Technology

1. Ethernet passive optical network. The application of Ethernet passive optical network to power communication can provide users with rich service transmission functions by means of Ethernet. At the

same time, this technology has the characteristics of multi-point structure, passive light and so on, and can improve the service opening ability by using Ethernet passive optical network topology technology, and can improve the overall efficiency and quality of maintenance work.

2. Packet transport network. In order to improve the security of power communication system, it is necessary to give full play to the role of packet transmission network, select different examples reasonably according to the characteristics of the system, and divide the network into access layer, aggregation layer and backbone layer according to different regional levels. Packet transmission network can realize the function of ring network protection and linear protection, and make network level protection more comprehensive and effective, so as to promote the normal operation of power communication system.

3. Intelligent optical network. The combination of intelligent optical network technology and power communication can realize the dynamic sending of service requests by the client, and automatically select the route, and can also use signaling control to establish and dismantle service connections, and automatically complete the main meaning of network connection intelligent instrument optical fiber communication network.

4. Conclusion

In summary, light communication technology in power communication reflects a high application value, can promote the efficient operation of power communication system, fully meet the needs of information transmission, and can further reduce the cost of system operation. In order to give full play to the role of light communication technology in power communication, enterprises and related personnel should strengthen the research of light communication technology, and rationally apply it to engineering construction to promote the sustainable development of power communication industry.

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