Research and Analysis on the Integration of Power Communication Technology and Information System

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Abstract. The integrated development of information and communication technologies has a positive effect on the management level and safe production of power companies. It can change the situation of weak technical services and single management mode, and achieve healthy and stable development of enterprises. In order to accelerate the process of convergence of information and communication technologies, power companies must continue to innovate in maintenance and operation, so that they can better play a role in grid production and operation, and help enterprises create a first-class power grid.

1. Introduction

Effective and timely transmission of power information by power companies is a prerequisite for the application and development of power communication technologies. Integrating power communication technology and power information technology can truly create a scientific, reasonable, safe and effective power information system to help power companies automatically control power. The information management work has improved the efficiency of power companies.

2. Significance of the integration and development of power grid information and communication technology

Under the premise of digitalization in the world, information and communication technologies are gradually becoming an important role in power management, marketing, operation and production from the traditional edge and auxiliary status in the power system, providing a safe and efficient production for the power industry [1]. Important Guarantee. With the continuous application of power management and production applications and services, information and communication technologies are constantly expanding and gradually integrating. It is of great significance to abandon the traditional model of the development of information and communication, optimize the management system, promote technology renewal, form the information and communication value sharing, and integrate the symbiotic resource environment and development pattern, laying a foundation for the healthy long-term development of power companies [2].
3. Key elements of the integration and development of grid information and communication technology

3.1. Power transmission network communication technology
At present, the communication network of power companies basically uses optical fiber as the transmission trunk, and some large power companies are forming an optical transmission network to replace the traditional communication network. The optical transport network is a new type of communication transmission system, which can protect the routing function in the optical layer and the electrical layer, and solves the problems of poor protection capability of the transmission network, weak networking capability, small bandwidth granularity, and low adaptation efficiency. The optical transport network is divided into a management plane, a control plane and a transport plane, which realizes automatic management, connection and configuration of the optical transport network [3].

3.2. Power exchange network communication technology
Flattening, converging and IP are the main features of the switching network. The switching network is the core technology of NGN. It can provide rich service functions. Through the integration of multiple networks, the separation of bearer and control and the mobile network service and solid are realized. The integration and integration of the network can fully meet the needs of end users for multimedia and diversified services, and fully realize the integration of video, data and voice [4].

3.3. Power Internet Communication Technology
Pv6 technology is the core technology of the next generation of the Internet. Although the current next-generation Internet technology has not yet been fully applied, information and communication are consistent with the existing grid control management system [5]. With the improvement of production requirements and the upgrading of technology and equipment, Information communication can be developed in an evolutionary way with the Internet.

![Figure 1. Grid information communication technology](image-url)
4. Influencing factors of power communication technology and power information fusion

4.1. Technical factors
With the advent of the new era, intelligence has entered all walks of life. The integration of power information and power communication technology in power supply enterprises has provided many types of work methods for employees, which is an inevitable trend of enterprise development. The integration of power information and power communication technology has changed the traditional working mode of power supply enterprises. It can collect, analyze and store power data information, making the production and operation mode of power supply enterprises more flexible and changeable. It is necessary to continuously introduce advanced technology into power supply enterprises. This is an inevitable trend in the development of power supply enterprises. At present, the advanced new technologies of power supply enterprises are mainly: core technology, soft switch technology and access network technology. If we want to effectively integrate power information and power communication technology, we must proceed according to these three new technologies, and use these three as the development platforms of enterprises to promote the effective integration of these two aspects and build an intelligent platform for power supply enterprises.

4.2. Economic factors
At present, power companies are in a transitional period. With the development of the economy, the scale of enterprises is increasing, and the demand for electric energy is increasing. Therefore, the pressure on power supply enterprises is also very large. In order to increase the supply of electric energy, it is imperative to introduce intelligent technology and practically apply advanced computer network technology to promote the development of intelligent enterprises with the support of power information and power communication technology. Computer network technology continues to develop and advance, and its technology is widely used in various industries, effectively promoting the development and progress of enterprises, and the application of power supply enterprises has greatly improved its business service level and economic benefits. In order to continuously improve the transmission level of information on power supply enterprises, it is necessary to adopt some technical methods. Power information and power communication technologies must be integrated with each other. This can effectively balance social and economic development with power supply enterprises, and thus ensure the health and stability of power supply enterprises. Development and progress. The purpose of the country to increase the construction of power engineering projects is to meet the needs of social and economic development and people's work and life. However, the construction of power engineering projects requires great capital, and the effective integration of power information and power communication technologies can greatly reduce costs and maximize the economic benefits of power supply companies.

Figure 2. Contact diagram of the power communication technology network
4.3. Cultural influence factors
With the deepening of the intelligent development of power supply enterprises, the power communication technology is constantly improving. The mode of intelligent development of power supply enterprises can make the employees of power supply enterprises have more forms of work. The development of communication technology depends on computer network technology. It provides technical support for communication technology, and the integration of power information and power communication technology can effectively improve the efficiency of power supply enterprises. At present, the power supply enterprise system is constantly undergoing transformation, and it has gradually entered the market economy. Since the competition in the market economy is very fierce, if it is still to be eliminated as before, it is necessary to strengthen the management of power supply enterprises, improve their work efficiency, and then promote power supply. Enterprise development has reached a higher level.

4.4. Influencing factors in information
Advanced computer network technology and software are the most advanced technologies, and they are also the characteristics of the integration of these two technologies. The core technology of computer network is established, and the program is embedded in the network. The program has expandable functions, thereby improving the working efficiency of the computer network system. The continuous development of optical fiber and wireless broadband technology has greatly improved the integration of power information and power communication technology. For power supply enterprises, component power information systems, storage and analysis of various power communication information, integration of power communication networks and WLAN technologies. To make the service home, to provide more excellent power business services for the majority of electricity customers.

5. Analysis of integration measures of power information and power communication technology

5.1. Institutional integration of power information and power communication technology
To improve the power dispatching system, it is necessary to construct and improve the power information and power communication technology system. To ensure that the two technologies are consistent in scheduling, the power supply enterprise's equipment room and dispatching department must be independent, effectively promoting the mutual exchange of power information and power communication technologies. Convergence, power supply companies must build a complete automated dispatch system. The power supply enterprise subsystem and the virtual layer are integrated to realize the connection between the fixed terminal and the mobile terminal, so as to avoid the synchronization when transmitting the power information, thereby improving the fusion of the two technologies, and realizing the consistency of the power information and the power communication technology scheduling, and further improve the application efficiency of power information, provide a good channel for the transmission of power information of power supply enterprises, and also monitor power communication information in real time, so as to find problems in time and solve them in time. The integration of power information and power communication technology also requires rules and regulations, and it is not arbitrary. As a basic management system, power supply enterprises must constantly improve the technical level, which can make the power supply enterprise's business activities more secure and stable, and standardize its work and achieve integration.

5.2. Dispatching of power information and power communication technology
In the production and operation activities of power supply enterprises, there are many businesses, and each link must be consistent, so that the energy can be smoothly and safely transmitted to the electricity customers, so the power supply enterprise must build a dispatch center. The power information and power communication technology are fully integrated. The dispatching department and the computer room of the power supply enterprise should be independent. It is not only to make the power information communication technology communicate with each other. The two must be independent. The
dispatching center of the power supply enterprise is the unified management of the two technologies. The place of supervision, the establishment of the dispatching center is perfect, real-time monitoring of various power information of the power supply enterprise, effectively improving the utilization rate of power information, and unified deployment can ensure real-time monitoring and real-time transmission of power information data of the power supply enterprise, and the operation staff can be in the dispatch center. Calling various power information to monitor the production and operation of power supply enterprises in real time, generally find problems in time and solve them in time.

5.3. Integrating the work flow of power companies
In the development of power companies, in order to achieve the integration of power communication and power information, it is necessary to have a unified dispatching room, and power dispatching staff to monitor and dispatch information and communication. In order to realize the comprehensive integration of power communication and information in the construction process. To connect, it is necessary to separate the dispatching room and the computer room of the power system, and establish a unified information management platform in the power grid. After the power communication and information fusion, the power communication part transmits information as the transmission channel of the power information. When the information is transmitted, the work permission of the information needs to be realized through communication scheduling, and the monitoring result of the information part needs to be fed back to the communication scheduling. This increases the understanding of the communication channel on the transmission status of the transmission information; enhances the operation, maintenance and management of the communication information. By establishing an information monitoring system in multiple directions, monitoring of each communication station is realized through unified monitoring, thereby ensuring the efficiency and security of power communication and power information fusion.

5.4. Basic technology for converging power communication and information
The fusion of power communication and power information is based on the basic information of both. When the power system is in the communication mode, the corresponding communication management system should be established to ensure the safe and stable operation of the communication, and at the same time, the standardization and standardization of the communication operation and maintenance work are realized. Develop a communication emergency response plan and realize the feasibility of its operation. The communication operation is carried out in strict accordance with the operational requirements and specifications, and the implementation of the site is monitored. Communication quality is guaranteed through rigorously standardized operations and communication monitoring.

5.5. Realizing the sharing of power information resources
By establishing an information system operation platform and a unified information monitoring center, information resources can be shared. In the operation process of the information system, the system must be managed uniformly and the system monitored and scheduled. In order to ensure the safe and normal operation of the system, it is necessary to arrange professional personnel to operate it, so that it can regulate and maintain the power grid information resources in a professional manner. In order to grasp the operation status of the grid information system in time, the IMS system can be established to monitor it in real time. Then, the operational indicators of the information in the system are analyzed and adjusted periodically, and the information system is regularly maintained to ensure the management level of the information management system.
5.6. Integrating multiple power communication technologies

In combination with the current development of power systems, consider the technical integration of power communication technology and power information. In the future, the data information of the power industry exists in a dynamic manner. Although the power system has the ability to transmit large amounts of data at this stage, as the demand for society increases, the load on the power system will inevitably increase. The power system relies on data development. Therefore, the development value of the power industry lies in the technology integration of power communication technology and power information. The integration of technology level mainly includes the integration of core network layer, network access and soft switch technology.

5.6.1. Converging the core network layer. The integration of the core network layer is mainly realized by IP technology. The purpose is to strengthen the reliability and security of the communication network. The convergence of the network layer is mainly manifested in the timely delay control, which is realized by the stability of the power system. Increase the utilization of bandwidth to some extent. Because the distribution network itself has strong stability, the integration of the core network layer can help the power system to fully expand. The core network for building multi-user convergence has been recognized by the power communication system. By building a high-reliability, high-stability, low-latency boutique network, the broadband utilization rate is improved and high-quality power services are provided.

5.6.2. Converged access technology. Through the development of access network technology, it can effectively promote the promotion and use of related applications, but the current network development of power companies is not too ideal. The converged network can serve the power enterprise, especially the passive optical network (PON), from the fixed network, Ethernet to mobile WLAN. Therefore, the access network technology does not have a good redemption environment and cannot be promoted and used. The integration of power information and power communication technology can promote the development of access network technology. By effectively integrating monitoring and network technology, system monitoring and network connection can be realized. Through the integration of power information and power communication technology, the access network can realize broadband access of public data networks, which can affect the future development of the power communication industry. Can adapt to the requirements of the times.
5.6.3. Two-way fusion soft switch technology. Traditional circuit-switched equipment differs greatly from information systems. Soft switch technology can better support existing voice and data services. Soft switch networks can also provide open application interfaces, which can easily utilize new network facilities. In combination with the needs of the power system, various power information services are carried out, and the effective integration of power information and power communication is better realized. To realize the two-way convergence of soft switch technology, it is necessary to connect multiple communication systems. The four aspects of service, control, transmission and access affect the evolution of soft switch networks. Through the combination of the above four aspects, data transmission at all levels can be optimized. Improve the safety and reliability of the power grid and alleviate the information transmission at different levels, such as technology and service plane. It can also improve the complexity of diverse media in information transmission and realize the integrated operation of power communication technology and power information.

![Figure 4. Technology convergence technology of power communication technology and power information](image)

6. Conclusion
In summary, as a component of the modern information communication field, the effective integration of power communication technology and power information requires the inspection and guidance of science and technology. As a core technology for development, power communication technology can fully play the role of modern information communication. To realize the intelligent and highly informational development of power information systems, fundamentally improve the quality of power companies without quality, which can help enterprises achieve huge economic benefits and expand social influence to the greatest extent.

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