

# Application Analysis of Power Communication in Intelligent Power Grid

Qiao Zhihui

Ordos Power Industry Bureau, Inner Mongolia, Ordos 017000

**Abstract:** In the course of the development of China's modernization construction, the intelligent power grid is one of the main contents, and the power communication can effectively promote the construction of it. In order to make the power communication technology play a good role in the intelligent power, so that China's power industry can develop continuously, the chief need is to effectively implement the power communication in the intelligent power, and only the combination of the two can ensure the smooth development of power enterprises. Therefore, great support from our government and related departments is a urgent need for construction of the intelligent power. Because the power communication technology is not only the key element in the development of the power industry, but also the solid foundation of the development of intelligent power grid, therefore, the full application of power communication in the intelligent power grid should be paid great attention to and be implemented energetically.

**Key Words:** Intelligent power network; Power communication technology

**Publishing Online:** 30th Nov 2017

## 1 Introduction

GridWise is the basic development direction of the power system in our country in the future, and power communication will provide help for the realization of intelligent power grid, through which better service will be provided. In order to develop the power system, it is necessary to develop the system dispatch work which should be centralized control so as to improve the security

of power supply system and rationalization of distribution. In power system, we should use power communication to commercially regulate basic works such as automation and security maintenance so as to promote the intelligence of power grip.

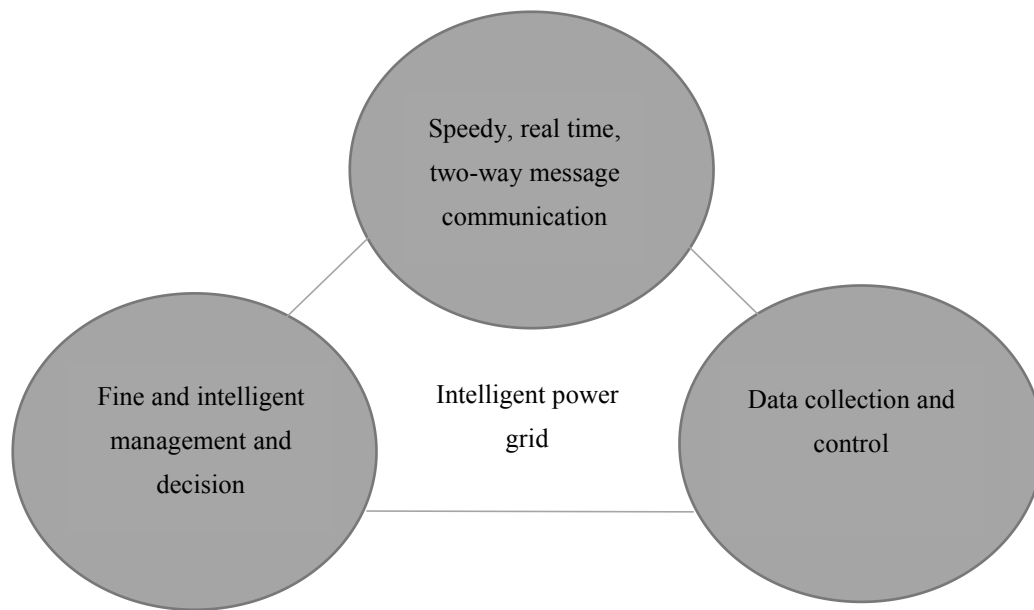
## 2 Overview of the Power Communication and Intelligent Power Grip

Power communication is a critically important component of modern power system, and also the guarantee of effective commercialization of power industry. It is able to dispatch the power system centrally in a wide range to realize the scientific and reasonable operation of power system and distribution of electric energy. As a basic link of power grid security automation and the beneficial help to realize the modernized management of power industry, power communication plays an increasingly important part in power communication.

Intelligent power grid is the symbol of automation of power system and a specific process for effective management of power system. Based on power communication and combined with all kinds of advanced intelligent technology and equipment, the intelligent power grid can create a highly efficient and economically safe power coverage, ensure safety and efficacy in all aspects of power transmission, and monitor users and their locations all the time so that once electric accident or incorrect electricity behavior happens, the sensor can automatically closed into safe mode. Except meeting user's electricity needs, the intelligent power grid

can also accept different types of power generation. See

characteristics of intelligent power grid in Figure 1.



**Figure 1 Characteristics of intelligent power grid**

### **3 Current Situations of Application of Power Communication Technology in Intelligent Power Grid in China**

#### **3.1 Unstable Operation of Power Grid**

It is one of the common problems in the operation of power grid that the power grid is not stable enough. There are many reasons for the unstable operation of power grid, including earthquake, typhoon, man-made destruction and other external factors. In addition to these external factors, the internal factors of the grid include are flawed practical plans, non-standard quality testing of the origin of the source, and non-standard power construction and so on. Different factors will have different impact on the power grid, and the common problems are the power imbalance of power grid, low efficiency of power supply, etc. Currently, in the process of the construction of intelligent power grid, owing to the lack of effective means and solutions to face these problems, we only have methods such as carrying out simple risk prediction and strengthening the operation and management of power grid, which cannot fundamentally solve the problem of

unstable power grid operation.

#### **3.2 Communication Technology Itself Has Some Defects**

At present, China's market competition is more intense, power communication technology should seize good opportunities to develop and improve, but to a certain extent, it can not very well meet the high demand from intelligent power grid. As the most important core technology of intelligent power grid operation, China's power communication technology has made progress on many levels on the transformation between digital communication network and analog network and the transformation of software and hardware, which proves that the power communication technology has changed and progressed greatly in the course of development. However, there are some deficiencies that we should pay attention to and deal with. When the power communication technology is broken down, timely measures often cannot be provided, so that ideal results have not achieved in the specific construction and repair of the intelligent power grid.

## **4 Perfecting the Application of Power Communication in Intelligent Power Grid**

### **4.1 New Energy Field**

The application of power communication technology in the intelligent power grid has diversified characteristics, and the new energy field is mainly divided into two aspects: renewable energy and non-renewable energy. The traditional power system takes the non-renewable energy as the main part, but after the development of the intelligent power grid, renewable energy is used as the main power generation, and the power system is changed. At present, there are many scholars and experts are constantly researching on the new energy field, especially on methods for the control of renewable energy, so that it can play a good value in power communication and effectively improve economic benefits. The premise of integrating into the new energy for the power communication industry, management personnel's formulation of the interface must be reasonable, and the voltage and electric power should be automatically controlled by intelligent system. When using new energy to generate electricity, we should manage the power communication technology effectively, so that the power system can meet the demand of new energy operation.

### **4.2 Application in Power Transmission**

The construction of intelligent power grid is also to better carry out the transmission of power resources, make the power system more efficient, improve the capacity of transmission, advance the operation efficiency of China's power grid, and enhance the optimal allocation of power resources. Currently, there are two applications of power communication in intelligent power grid, which are the real-time monitoring and the expansion of transmission capacity. The real-time monitoring of power system mainly collects the basic situation of power system operation, collects the information of emergencies, the operation of the intelligent power transmission line and the surroundings, etc. In addition, except expanding of transmission capacity, first of all, we should establish

effective plans to ensure that different institutions, units and devices can transmit power in a stable manner, handle the power data in an unified way, in order to establish the intelligent power grid finally.

### **4.3 Application in Power Distribution**

In order to make the operation of intelligent power grid safe and stable, the premise is to have a flexible and reliable power network architecture, and to cooperate with the secure communication network, so that various resources can be distributed seasonably and intelligently. In this regard, we should pay attention to, after the application of electric power communication to the distribution, better function of processing failure automatically, to ensure that fine energy storage components and distributed power equipment can be effectively connected to the power system, so that the overall power supply capacity is improved. At present, intelligent distribution has realized the network communication and sensor test, which not only has greatly promoted our country's distribution system to the integration direction development, but also has promoted the further interaction between users, and the compatibility is also much stronger than before.

To sum up, the transformation of the power industry cannot achieve success without the application and development of power communication in the intelligent power grid. It can be seen that power communication plays a more and more important role in the intelligent power grid, and the application of power communication in the intelligent grid is increasingly extensive, which makes the intelligent power grid gradually become smarter from informatization and plays a very important role in the distribution process and the safe operation of the power grid. Some disadvantages were also found in the application of power communication in the intelligent power grid, so it is necessary to increase the power technology of high-end talent training and strengthen the study of power communication technology, and finally realize the sustainable development of intelligent power grid.

## References

- [1] Zenghui. Discussion on Application of Power Communication Technology in Intelligent Power Grid[J]. Telecom World,2015,(21):86-87.
- [2] Zhang Hongxia, Guo Baocai. Application of Power Communication Technology in Intelligent Power Grid[J]. Information & Communications,2014,(12):244-245.