UDC 621.316

IMPROVING THE EFFICIENCY OF USING REMOTE MONITORING SYSTEM OF SMART GRID

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The article describes the possibilities of using remote monitoring of an intelligent network. The architecture for intelligent monitoring systems in the power industry is considered. The equipment for remote monitoring is described.

Introduction. With the continuous development of science and technology, the benefits of remote monitoring of smart grids have undergone an essential transformation, beginning to shift from transient monitoring to real-time monitoring, forming highly efficient and intelligent monitoring content. Relevant information shows: Most smart grids in my country have built a relatively complete smart grid remote monitoring system based on communication technology, automation technology, remote measurement, etc., and built a systematic and hierarchical remote monitoring network. The development of electrical work has laid a solid foundation [1].

The development history of smart grid remote monitoring. In the process of constructing the smart grid remote monitoring system, the system equipment needs to be reasonably selected, and the corresponding equipment system must be formed in accordance with the requirements of the smart grid. In the traditional smart grid remote monitoring system, image monitoring equipment is mainly selected as the main body of remote monitoring, and digital remote image monitoring equipment is used to transmit remote information to the front-end digital host.

The TCP/IP protocol accesses the host, calls image files, and realizes remote control.

With the continuous deepening of power grid construction, the above-mentioned video monitoring system has gradually been eliminated, and the remote monitoring system with self-healing and self-protection capabilities has begun to become the core of the development of the power grid. Especially after the mature application of smart grid checking and receiving, power grid backup and self-investment to the construction of smart grid, my country's smart grid remote monitoring system has undergone an essential transformation. The current smart grid remote monitoring system mainly integrates computers, communications, sensors and other devices on the basis of traditional power grids, forming a digital, intelligent, automated, and interactive online monitoring system, which has abnormal monitoring and self-healing capabilities, and reduces The necessary manual supervision greatly improves the efficiency of remote monitoring of smart grids [2].

Construction of remote monitoring system for smart grid. In the process of this research, the application benefits of the smart grid remote monitoring system are studied mainly by taking a certain regional power supply and distribution system as an example. The current research results are as follows.

A regional power supply and distribution system is mainly responsible for regional domestic and industrial power consumption. The power supply and distribution environment is relatively complex, the area is relatively large, and the daily management work is very heavy. Since 2012, in order to further improve the efficiency of power transmission and distribution monitoring and reduce line failures and line losses, relevant departments have begun to set up an intelligent monitoring system on the basis of traditional monitoring work, and adjust the traditional video monitoring system to form a smart meter, smart The new remote monitoring architecture with switch and indoor control as the core has comprehensively improved the stability and reliability of smart grid operation. Relevant data shows: There has been no large-scale power outage in this area within 5 months

of applying the smart grid remote monitoring system, and the quality of power supply and distribution has been significantly improved, which has very high use value and reference significance [3].

Remote monitoring system settings. The remote monitoring system of a smart grid in a certain area is mainly realized through user-side control. The smart devices are set on smart meters, smart switches, and standby automatic input devices to complete online monitoring, abnormal alarms, fault location, etc., and realize power supply and distribution of the power grid. The real-time monitoring and control of power grids have effectively improved the safety and reliability of grid operation.

Smart meter settings. Choose a smart meter with energy measurement and power supervision for installation, and determine the power, rated voltage, rated current and other values according to the smart grid line conditions to ensure that the smart meter can fully collect user power information and lay a good foundation for the development of remote monitoring work. For general meter communication, RS485 bus or carrier bus can be selected, which can be appropriately selected in combination with the actual regional communication network.

The above-mentioned devices mainly collect various data in the smart grid through smart meters, transmit voltage data, current data, etc. on the corresponding circuit to the electric energy measurement device, complete the data processing in the microprocessor, and guarantee on the basis of the electric energy supervision protocol Distributed generation management works with smart meters to achieve a smooth transition of islands and upload abnormal data. With the help of smart meters, efficient calculation and analysis of voltage, current, frequency, power factor, etc. in the faulty area are used to ensure that the system can quickly complete abnormal grid operation data Processing and alarm according to fault information, minimizing the risk of smart grid operation.

Smart switch settings. During the switch setting process, ensure that it can realize line over-current and over-voltage protection, reduce line faults through switch power-off, and realize remote online protection. There are many types of smart switches in my country's smart grid. When choosing, make sure that: smart switches can realize power consumption measurement; smart switches can transmit user power consumption data and complete system data interaction; smart switches can receive user control instructions and complete the corresponding control operations, including power-off, power-on, line switching, etc. For this reason, KSC series switches and 7000 series switches are mainly used in remote monitoring of smart grids in this area. The KSC switch is small and exquisite, which can be used for smallest signal control needs, is simple to operate, and has a relatively stable communication transmission effect. "Switch" is configured to provide single-pole, double-pole and three-pole configurations with on, off and instantaneous action, which can adapt to the harsher climatic environment, and the practical application benefits are very significant.

Prepare the setting of self-investment device. In the process of transforming the smart grid in a certain area, the standby automatic input device is very important, and the paper system suitable for regional transmission and distribution has been formed by drawing on the experience of setting up the standby automatic input device of the power grid in the province. The core of the automatic input device is the UFV-200 control system, which has passed the industrial 32-level.

The ARM core realizes data processing and configures backup protection to complete the corresponding two-way backup investment according to different conditions. For example, when abnormal information is checked or the standby input is manually commanded, the standby automatic input device can perform standby automatic input operation according to specific data and instructions, realize very complicated standby power automatic input logic and two-way standby input, and minimize line failures The resulting interruption of power transmission and distribution has comprehensively improved the safety and stability of the smart grid.

Visual display system. The intelligent control module integrates the data collected by the front-end, comprehensively analyzes the position data and status data, determines the actual operating status of the lines in each area of the smart grid, and obtains that the online monitoring and processing data results are stored in the system.

This kind of data is relatively complex and often needs to be visualized and displayed. The actual operating status of smart grid lines can be displayed through images, text, videos, etc., to ensure that managers, maintenance personnel, etc. can quickly determine the actual operating status of the smart grid. Based on the data of smart meters and smart switches, the accurate location of the fault area is completed. Once a problem occurs, the remote monitoring system sends out alarm messages and control instructions to eliminate the fault in time and quickly restore regional power transmission and distribution.

Data storage. During the construction of the smart grid remote monitoring system, the data storage unit needs to be emphasized. The historical data storage unit and the report generation unit are formed according to the actual data storage requirements, and the power value, clock information, geographic information, etc. are sorted according to a certain time interval to form Complete smart grid operation status report; save the generated report through online storage of historical data, directly borrow the historical data function in the visual display to call up the visual data graph, realize quick comparison, and provide powerful data for smart grid monitoring and fault analysis support.

Application effect. During the operation of the above-mentioned monitoring system, real-time monitoring of the power consumption status of the smart grid is realized, and the line loss status in the area is comprehensively controlled and coordinated. The line loss area in the area is fundamentally reduced, and the monitoring and management of power resources are strengthened. Realize the real-time analysis of power data and form the "record" of power application, which provides a good technical guarantee for anti-theft. It can realize real-time meter reading and reduce unnecessary manual meter reading input in conventional smart grid monitoring. Greatly reduced the company's power monitoring costs; realized real-time and intelligent smart grid monitoring, provided reliable data and technical foundation for power supply marketing automation, and realized the overall improvement of the company's smart grid modern management benefits.

Optimization of Remote Monitoring of Smart Grid. *Build a remote monitoring database.* The amount of smart grid information data is relatively large, and simple remote monitoring of the smart grid cannot meet the data processing task. Therefore, database technology can be introduced in the process of daily operation, the corresponding monitoring data information can be stored through the database, and it can be digitally processed, stored and output, which lays a good digital information foundation for the development of remote monitoring of the smart grid. In the process of database construction, the binary processing method can be appropriately selected to adjust the image information, thereby increasing the storage capacity.

Adjust the communication mode of the system. With the continuous development and improvement of communication technology, the communication technology can be adjusted when the smart grid remote monitoring work is carried out, and the communication system can be reasonably optimized according to the conditions of each region, and real-time data services and status data pushes can be provided to managers to ensure that they can be comprehensive Grasp the operating status of the smart grid. If the anti-interference ability of carrier communication is poor, you can choose areas with simpler regional lines and shorter communication lines when setting up; RS485 has stronger anti-interference ability but higher cost, and it can be used in remote areas during the setting process. Areas with severe transmission and interference, etc., under the premise of ensuring the effectiveness of communication, realize the control of cost investment and maximize the operating benefits of the smart grid remote monitoring system.

Realize the professional construction of the team. In the process of improving the smart grid remote monitoring system, personnel must grasp the overall structure of smart grid remote monitoring, appropriately introduce intermediate interface equipment, and combine the four-remote system with the multimedia monitoring system to form a good monitoring structure. You can appropriately choose the form of layer-by-layer scanning to analyze the operation status of smart grid remote monitoring equipment and implement targeted

data processing. Once the displacement information is accompanied by time, immediately request the terminal to implement information control [4].

Conclusion. In the process of constructing the smart grid remote monitoring system, it is necessary to emphasize the various parts of the remote monitoring device. On this basis, set up electricity collection, intelligent control, backup protection and centralized monitoring to form a systematic functional system and view system, Management system and information processing system, so as to build a complete remote monitoring structure, realize the comprehensive control and coordination of remote information of the smart grid, and fundamentally improve the monitoring benefits of the smart grid.

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