Application of Hydrological Telemetry Terminal Technology in Hydrological Information Forecasting

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Abstract: Hydrological intelligence forecasting is very important for the prevention and control of flood and drought disasters in China. It can provide useful data information for flood control and drought relief work in China through the use of hydrological telemetry terminal technology, which can be used as a basis to effectively reduce the probability of occurrence of flood and drought disasters and minimize the loss of flood and drought disasters. With the rapid development of science and technology, hydrological telemetry terminal technology has been fully applied in the collection and analysis of rainfall data information, so it needs to be paid attention to. This article mainly discusses the specific application of hydrological telemetry terminal technology based on its functions and principles.

1. Introduction

The application of hydrological telemetry terminal technology plays a key role in hydrological intelligence and forecasting work. As an important part of hydrological intelligence work, hydrological telemetry systems can make full use of multiple basic modules such as data sensing devices, wireless communication devices, and systems, and link them to form an independent and complete hydrological intelligence system, which can truly combine actual water conditions to conduct more comprehensive, high-quality, and efficient monitoring, To ensure the objectivity, comprehensiveness, and accuracy of hydrological monitoring results, thereby laying a foundation for the implementation of subsequent work. In order to give full play to the role of hydrological telemetry terminal technology, it is necessary to understand and master the basic principles and practical skills of hydrological telemetry terminal technology, so as to ensure that all aspects of practical work can be controlled in place and comprehensively improve the level of hydrological information forecasting work.

2. The Importance of Hydrological Information Forecasting

Hydrological information forecasting is the core link in drought and flood control work, providing great assistance for drought and flood control work in China, and also bringing certain economic benefits. The hydrological information forecasting work is relatively dependent on manpower, for example, detection and recording need to be recorded manually, so as to record and analyze the monitored environmental water regime and summarize the change rules. After that, formulate targeted prevention plans based on the results of monitoring and calculation. If any abnormality occurs during the implementation process, the testing personnel should promptly observe it, and if it continues to develop, it should be able to handle it according to the selected measures.

At present, China's investment in hydrological information forecasting is still significantly insufficient, and some forecasting facilities are relatively backward, with weak flood measurement capacity, which has a significant impact on the development of drought relief and flood control work. Most of our country is mountainous, so under the influence of climate and terrain, floods and droughts occur frequently, which has a significant impact on our agricultural production and living environment. In the work of disaster reduction and resistance in China, hydrological information

forecasting technology, as a non engineering link, is also the most important basis for drought and flood control work. The quality of hydrological information and forecasting work is closely related to industrial and agricultural production, and it can also have an impact on the safety of public life and property. Therefore, it is very important to strengthen research related to hydrological information forecasting work.

3. Working Principle, Communication Mode and Communication Characteristics of Hydrological Telemetry Terminal Technology

3.1 Working Principle

The hydrological telemetry terminal technology is mainly based on digital technology and information technology, coupled with corresponding measures such as satellite base stations and radio remote terminals, which can effectively ensure the stability of telemetry communication and play an important role in hydrological monitoring work. The hydrological telemetering terminal technology mainly includes two equipment: a rainfall sensor and a water level telemetering instrument, which can be used to understand the hydrological situation through monitoring. In this way, the water level can be automatically sensed, and the underground water level can be continuously recorded 24 hours a day, thereby ensuring the authenticity, effectiveness, and integrity of the data itself. After accurately collecting and recording water level information, it can be transmitted back to the telemetry station for storage, thereby providing more powerful data support for the orderly implementation of subsequent work. In the process of monitoring rainfall, rainfall sensors can be used to observe and carry out corresponding work. Spring switches, internal contacts of the tipping bucket, etc., can have varying degrees of impact on the monitoring results. It can be seen that when using a water level telemeter to sense and measure the water level, it is necessary to promptly replace the tipper and adjust the spring switch, which can facilitate sending signals and recording signal data information. The hydrological telemetry terminal technology is most widely used in the link of computer analysis and recording of rainfall and water level. The hydrological information obtained can be displayed in the form of reports, images, and other forms for easy reference by relevant personnel. In the work related to hydrological intelligence and prediction, the introduction of water temperature telemetry terminal technology can optimize some of its resources, promote effective improvement of work efficiency, facilitate the early warning of subsequent disast.

3.2 Communication Methody

The hydrological telemetry terminal combines computer and radio communication technologies to form a high-tech system, and staff only need to use radios to control it. This operation mode can not only effectively reduce the monitoring workload of the staff themselves, but also greatly save the number of staff themselves, labor costs, and some other expenses. In hydrological telemetry terminal systems, there are mainly GSM, GPRS, satellite base stations, and ultrashort wave communication methods. In the late 20th century, ultrashort wave and satellite stations were the most commonly used communication methods for hydrological telemetry terminals. Ultrashort wave mainly used radio stations as transit stations to transmit corresponding data, but it is easy to be interfered by the outside world. The communication rate is relatively low, and the bit error rate is also difficult to control. The overall signal is weak, and the transmission range is limited, It is easy to be interfered by electromagnetic interference, and it is difficult for the system to maintain a safe operating state. Satellite base stations themselves are frequently used and have relatively long transmission distances, but their operating costs are relatively high. Judging from the current actual usage, GSM and GPRS communication methods have relatively good security, high reliability, strong stability, and relatively low operation and maintenance costs. If there is a problem with the GMS mobile base station, you can immediately transmit the information to other base stations to ensure the safety of information transmission. If the wireless terminal inside the GSM infinite communication module fails, the short message transmission will display a failure, so you can directly check the failure. The use of GSM/GPRS networks only requires the payment of

corresponding SMS fees, and the network does not require additional investment, which can greatly reduce the cost of telemetry.

3.3 Communication Characteristics

Most of the VHF ultrashort wave communication methods previously used are radio stations that transmit data. Because this communication method basically uses ordinary radio stations, the communication rate is relatively low, and the transmission range is small, which is prone to error code, leading to significant increases in system operation difficulties. Through practical analysis, it can be known that the hydrological telemetry terminal technology has high stability, relatively high overall security, and low actual costs. Once a problem is found with one of the mobile base stations, the information will be automatically transmitted to other base stations, thereby ensuring the security, stability, authenticity, and effectiveness of information transmission; On the other hand, in the process of using the wireless communication module, it can also provide the function of short message verification. It can check whether the terminal equipment book is in good operation status by means of short message. Once the equipment itself fails, the short message sending will show that it is in failure status. In this case, the hydrological monitoring work cannot be carried out smoothly. At the same time, it is necessary to immediately check the equipment. After the establishment of the CSM network, it is only necessary to pay for SMS messages, rather than the maintenance costs of the network itself. Therefore, the overall cost is relatively low.4.Application advantages of hydrological telemetry terminal technology

3.4 Advantages of Hydrological Telemetry Terminal Technology and Equipment

The use of hydrological telemetry terminal technology consists of monitoring equipment, communication equipment, data receiving equipment, and processing equipment. The details are as follows: (1) Monitoring equipment is the most complex, designed to include water level sensing equipment, flow sensing equipment, etc; (2) Communication equipment. Infinite weaknesses, mobile private networks, etc., are included; (3) Data receiving and processing equipment. It is mainly composed of computers, data systems, etc. Each part of the equipment includes multiple advanced instruments and equipment, which together constitute a hydrological telemetry terminal system, greatly improving the efficiency and quality of information collection and transmission, and also promoting significant improvement in the accuracy of monitoring data.

3.5 Progressiveness of Hydrological Telemetry Terminal Technology

Hydrological telemetry technology is a relatively new type of scientific technology, which organically integrates computer technology and hydrological monitoring technology, and has obvious comprehensiveness. In the process of practice, it is possible to achieve all-weather monitoring and automated monitoring of hydrological monitoring objects. After the monitoring and telemetry equipment obtains the monitoring data, it can transmit information through the transmission system. After receiving the information data, the detection center can analyze and organize it through a special system. For example, in the process of monitoring rainfall, rainfall sensors are the most important and important equipment. The sensitivity of the rainfall sensors themselves is closely related to the measurement results. Therefore, the timeliness and accuracy of the sensors themselves should be effectively guaranteed, in order to ensure the efficiency and stability of data and information transmission. After receiving various information and data, different application software can be used to process the incomplete data, so as to meet the basic needs of flood control departments at all levels to query information. Staff can also comprehensively analyze the water situation, and in case of emergencies, they can formulate targeted response plans based on the predicted information to minimize the harm caused by natural disasters.

4. Application of Hydrological Telemetry Terminal Technology in Hydrological Information Forecasting

4.1 Automatically Collect Hydrological Data

The hydrological telemetry terminal technology is a key part of hydrological information forecasting work. It can automatically collect and organize hydrological data through the hydrological telemetry terminal system, and establish a special information transmission system to ensure the timeliness and effectiveness of information transmission. At the same time, it can also ensure that the hydrological information collection work proceeds more smoothly, and under the conditions of grasping factors such as rainfall and ground water level, real-time transmission of corresponding data can promote the smooth development of data statistics and data processing. In addition, within the limited current conditions and specified time frame, collect relevant data such as monthly average law and job completion rate to analyze the feasibility of telemetry technology..

4.2 Enable Active Query of Data

In the process of monitoring hydrological data, the monitoring center can be used to collect hydrological data information, query the monitored hydrological data information, and conduct comprehensive analysis on it. In this process, the monitoring center needs to send corresponding instructions according to the specified process. When the instructions reach the remote monitoring terminal system, they can return the corresponding information and data, and the query of hydrological information data has been completed. According to the specifications, standards, and requirements related to hydrological monitoring, remote measurement can be used to determine the hydrological information of terminal equipment, and the monitored hydrological information can be transmitted to the remote monitoring center in the shortest time..

4.3 Remote Monitoring is Possible

Remote monitoring is a key part of the entire hydrological information and forecasting work. With the help of hydrological telemetry terminal technology, it is possible to observe the state of the hydrological environment in real time and monitor hydrological elements. With the help of expert technology and methods, instructions can be transmitted to terminal systems and equipment, and corresponding instructions and data can be sent based on actual needs to achieve effective supervision of the overall system operation. In case of abnormal equipment operation, effective countermeasures can be taken in a timely manner to ensure the stability and effectiveness of the entire hydrological monitoring system.

4.4 Accurate Prediction and Analysis of Hydrological Information Can Be Achieved

There is a very close relationship between the work efficiency of telemetry terminals and hydrological intelligence forecasting. As an important equipment within the hydrological telemetry system, telemetry terminals need to collect, organize, and summarize useful hydrological forecasting information based on actual conditions, and conduct appropriate regulation and control after comprehensive analysis. The overall time value of hydrological telemetry terminal technology is high. Reasonable use and timely updating of equipment can fully realize the timely value of hydrological telemetry terminals.

5. Conclusion

On the whole, the hydrological telemetry terminal technology can automatically collect, collect, query, detect, and control water temperature data, and then analyze and understand the basic hydrological conditions through the obtained data, resulting in the most useful hydrological detection report. This provides useful data support for subsequent data analysis and response measures formulation by the flood control department, and also contributes to the development of hydrological forecasting work. It can be seen that attention should be paid to the application of hydrological telemetry terminal technology in practical work, the basic principles of hydrological telemetry terminal technology should be grasped, corresponding analysis and research should be carried out in combination with the water resources situation of the monitored area, and the

hydrological telemetry terminal technology should be scientifically applied to ensure that the hydrological intelligence and forecasting work is carried out more smoothly.

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