

Application of Modern Communication Technology in Water Conservancy Work

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Abstract: The role of communication is very important in the process of flood prevention work. Modern communication technology can transmit information effectively and implement the communication target of dispatching instructions. Today, the communication technology covers various types such as mobile communication, satellite communication, short-wave communication, optical fiber communication and digital microwave communication. These modern communication technologies are widely used in transmission of information during the process of domestic flood prevention and water conditions. This article focuses on the research of using modern communication technology as the main objective and its specific application in water conservancy work.

Keywords: *Modern Communication Technology; Water Conservancy Work; Application*

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0 Introduction

In recent years, the water conservancy system built a flood control communication network independently and implemented the combination between the public and flood control communication network. Besides, the water information transmission communication network was also successfully constructed. The self-built flood control telephone network and the public switched telephone network of the domestic water conservancy department have integrated effectively, which has boosted the association of water conservancy enterprises across the country. The water regime

automatic measuring system can transmit the water data information to the water conservancy department with the help of wide computer network, which provides a valuable reference in decision-making. Plus, with the modern communication technology, the water conservancy department can obtain information through the transmitted data, which allows them to grasp the water condition on time and make a necessary decision on flood control work and measures. In summary, it can be seen in-depth that studying and analyzing the application of modern communication technology in water conservancy work has provided a certain practical significance.

1 Technical characteristics of water conservancy system

1.1 Promoting cross-regional water diversion

China has a vast territory but when it involves the development of various regions, it is susceptible to many factors such as ecology, environment and society. In the construction of water conservancy project, expansion is needed to sort out and adjust hydraulic resources effectively^[1]. However, in order to improve the use of water resources, it is necessary to implement cross-regional water division projects to achieve the comprehensive development of water conservancy dispatching systems.

1.2 Water circuit involves many hydraulic buildings

The main purposes of building a hydraulic structure is to supply water and water and ensure the quality and stability of work during construction^[2]. Besides, making full use of the automatic control technology can also enhance this work. Plus, it is necessary to combine the basic characteristics such as fully utilizing

the role of modern technology and prioritizing the use hydraulic tunnel, water source management and river water division projects as an important information management in a developing a water conservancy project.

The monitoring system and scheduling operation are the focus in scheduling management with the help of computer platform^[3]. In this way, the remote monitoring of water conservancy dispatching can be improved comprehensively, and the statistics and management of relevant water division information can be systematically implemented, which resulted in a smooth development of water conservancy dispatching work. Therefore, it is necessary to introduce modern communication technology to further improve the quality of water conservancy dispatch system.

2 The application of modern communication technology in water conservancy work

Through the research and analysis of technical characteristics of water conservancy systems, it is necessary to focus on the specific application in water

conservancy work to continuously improve the quality and status of water conservancy work. Thus, it can prove a continuous improvement of the quality and effect of using modern technology in water conservancy work.

2.1 Using television and video conference calls

Television and video conference calls are essentially multimedia communication systems in the new era. Television and video conferences focus on communication network technology, computer technology and microelectronics technology. These are all committed to the digital development of media as shown in Table 1. Through using these different networks, a real-time transmission is achieved, and users can communicate with each other. Plus, under common circumstances whereby conferences are usually held in different locations, the users can listen to other party's voice and witness visuals that are provided. Thus, this allows both parties to understand the entire atmosphere, scene, object, documents and pictures around the room which has optimized the quality and efficiency of work to a certain extent^[4].

Table 1. Television and video conference call composition

Component	Main Technique
1	Communication network technology
2	Computer Technology
3	Microelectronics Technology

The public conference television business is the backbone of network. The composition of this network includes digital channels, conference broadcasting equipment and multi-point control unit (MCU). Therefore, the conference television system is mainly composed of a communication transmission channel and a conference room. In addition, the conference television system venue can be refined into a main venue and a branch venue. The former is the core of the conference and television system control, the internal arrangement of control equipment, switching equipment, visual and audio equipment, etc.^[5]. However, for communication channel of the conference television system, it generally includes three types such optical cable, optical cable and satellite channel and satellite. The main function is to transmit to information by collecting and compressing the primary signal of the venue. The conference television signal received by the channel needs to be combined with demultiplexing and audio video decoding process to restore and form the

data signals, audio and video signals of the conference venue.

2.2 Using flood control mobile communication vehicles

In an event of emergency such as the failing of network during a water conservancy work on the field whereby dangerous situation occurs and communication are missing, a mobile communication vehicles (MCV) is required on the scene to transmit live audio and video signal to the command center through satellite or wireless broadbands. Moreover, a mobile communication vehicle can also transmit information by telephone, fax and GSM mobile phone to the command center effectively^[6]. At the same time, on scene staff needs to keep in touch with the car intercom system. The command center can understand the danger of the water conservancy site in various forms. Thus, experts and leaders can formulate more accurate decisions based on the specific conditions of the scene.

In other words, it is specialized to help the leaders in dealing with emergencies through the command center effectively. Plus, real-time command and dispatch of the scene allows the safety of lives and properties as well as continuously strengthen the ability of disaster prevention and mitigation.

2.3 Using emergency visual communication technology

Emergency visual communication technology focuses on making full use of wireless high-definition picture data communication technology. Besides, due to its' real-time and convenient features, it is simple to set up at low cost and has strong versatility whereby it can be used through mobile network instantly^[7]. In addition, due to time constraints especially in an event of emergency during a water conservancy work, the demand for using visual communication technology is higher. Therefore, it is necessary to use this technology to cooperate with digital cameras and personal digital assistant (PDA) with mobile communication functions to obtain the ideal on-site high-definition pictures which can result in a better decision-making process. Among them, the digital camera needs to achieve the connection with the PDA through a wireless mode. Then, at the same time with the agreement, the target of the accompanying shooting can be achieved. In the actual application process, it is required to connect the PDA and the Internet by using a dedicated wireless network card.

When the PDA application software is running, the digital camera and the PDA will be linked and then the shutter can be pressed to take a photo. Thus, the text information of the water conservancy scene can be edited accurately and transmitted to the rear via the wireless network.

Finally, at this point, the rear decision-makers can get the real-life scene of the water conservancy as soon as possible^[8].

In recent years, the application of emergency visual communication technology is generally based on picture communication. The main reason is that, compared with video, the requirements for data communication broadband are lower, therefore the picture provided can be clearer and the quality is up to standard. In other words, video has higher requirements for transmission communication bandwidth. Therefore, if the bandwidth is insufficient or the channel stability is not strong enough, it will affect the clarity and stability of the video. Plus, in an event of emergency during water conservancy work, decision makers need to obtain static scenes on the scene instead of dynamic scenes. Therefore, the requirements for dynamic video are not high. In summary, visual communication plays a higher role in communication technology than a video communication. As shown in Table 2, specific criteria is needed to follow these requirements to achieve an accurate emergency monitoring equipment in taking high resolution photos of the scene as well as selecting various monitoring equipment on site.

Table 2. Emergency monitoring equipment selection focus

Situation	Focus
Long-term monitoring of certain river	If the application is monitoring a certain river, a fixed device and complete the shooting at a fixed interval should be selected.
Understanding the sensation of the river at certain moment	Understanding the sensation of a certain moment in the river, shooting in different positions and angles should be selected.

2.4 Using of transmitted information from scenes

The way water information is transmitted to the station mainly includes ultrashort wave, wired telephone, short wave and satellite, etc. However, laying fixed telephone lines requires a higher cost. Once a certain distance is exceeded whereby short-wave or ultra-short wave are used, it is required to create a relay station, or even to add a secondary relay station, which can affect the transmission effect but results in the increase of cost^[9]. In addition, the smooth effect of the short-wave channel is not ideal, and some devices have difficulties in adapting to the voltage requirements of the rural power grid.

Therefore, it is necessary to compare and filter multiple overall technical solutions as well as the design can be completed in combination with specific conditions and product equipment performance. In recent years, in the context of the successful efficiency of short-wave sending and receiving, the water information can be sent or received in various forms. It can set up various types of communication equipment such as ultrashort wave, short wave and telephone, which provides the necessary guarantee for newspaper communication as well as collect the water information of the stations in each water condition center within 20 minutes. In result, the reliability

and timeliness of water information transmission are optimized^[10].

2.5 Using published and query anti-flood information

In the water industry, flood control is very important. Through the usage of mobile communication, the flood control workers can obtain a variety of information such as new water briefings and flood forecasting and transmit them to leading mobile phones to make full use of flood control decision on time. In addition, the flood prevention workers can send corresponding query commands to the system

by means of short message and send corresponding data results to the query staff mobile phone to ensure that they grasp the flood prevention situation effectively.

In the water resources management scheduling configuration, irrigation area information and water and sediment adjustment, the role of communication technology cannot be underestimated. Although mobile communication methods are widely used in flood control and drought prevention and water resources management, technical difficulties always exist as shown in Table 3.

Table 3. Technical difficulties in flood control

Difficulties	Content
1	The high cost of wired telephone at hydrological station
2	Short-wave channel communication is unsatisfactory
3	Ultrashort and short waves are easily blocked
4	Create a relay station or a secondary relay station

2.6 Using e-government

The goal of actively creating an e-government system is to achieve a good work efficiency and to ensure transparency in government affairs. Therefore, making full use of the computer network to review the official documents, and variety of communication means to grasp the information and related work information of the official documents are necessary. This is to ensure that the circulation time of the official documents and the time of transmitting information are continuously shortened, and the transparency and efficiency of the work are fully optimized.

3 Conclusion

In summary, the above focused on the specific path of modern communication technology used in water conservancy work, which is mainly embodied in television and video conference calls, anti-mite mobile communication vehicles, emergency teletext communication technology and transmission of field collection information. The release and inquiry of flood prevention information and e-government have not only facilitated the development of water conservancy work, but also effectively boosted the application of modern communication technology. Thus, this has resulted in a valuable reference for the comprehensive sustainable development of modern water conservancy.

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