Research on Fire Alarm Monitoring System of Fire Engineering Based on Network

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Abstract. Under the background of rapid development of information technology, the design of fire alarm devices in fire engineering in China is becoming more modern and humanized. At present, under the traditional alarm function, the fire alarm system device embodies the functions of centralized alarm monitoring, fire linkage, automatic prevention and control, data transmission and so on, which lays a good foundation for the fire alarm construction of the new generation fire protection engineering. In this paper, the operation status of the fire alarm monitoring system of network fire protection engineering in China is studied and analyzed, hoping to provide reference for the corresponding units.

1. Preface
With the coming of 21st century, China's fire engineering technology has been on the road of modernization, scientification, intelligence and integration. Under the background of urbanization and economization, the linkage construction of urban fire monitoring system has laid an important foundation for ensuring the safety of urban fire use and avoiding fire accidents.

At present, modern fire protection engineering has the characteristics of network, which embodies the urban fire early warning and monitoring, fire linkage system control, intelligent fire alarm and fire alarm control. This paper studies and analyzes the application of fire alarm monitoring system in network fire protection engineering, hoping to realize propaganda, popularize science and guide fire protection construction.

2. Analyze the operation characteristics of intelligent fire monitoring and early warning system

2.1 Fire monitoring and information feedback
The main equipment of intelligent fire early warning and monitoring system includes single-chip microcomputer, heat sensitive and smoke sensor hardware equipment. Operators can judge the fire situation by detecting the environment, and then feedback the residual smoke and illumination problems during the fire by using measuring devices, and make timely linkage with the outside world, and then transmit the information to the single-chip microcomputer. Operators or intelligent equipment can compare it with multiple fire parameters to judge whether the fire has occurred.
2.2 fire occurrence judgment process
If there is a fire, the on-site system will transmit the information to the MCU, and the corresponding prevention and control unit will receive the fire alarm information fed back by the alarm, thus forming a linkage information chain in the form of a network. The alarm control system of the fire control center will compare and control the data according to the monitoring source information in time, and then complete the monitoring and processing task after analysis. In this process, the MCU will feedback the fire information according to the program written by the computer.

3. Based on the network environment, the application of fire linkage control and emergency treatment
Fire linkage control system is an independent module to ensure the operation of modern fire protection engineering, which is linked with fire hydrant control, water spray smoke control and exhaust system, emergency information dissemination and alarm control system. That is, the controlled device realizes information control through network physical connection. It optimizes the mediation problem existing in traditional hard control (the controlled device and linkage device have no network induction module and are completely connected directly), gn, soft control can also be adopted.

3.1 fire hydrant control design research
Fire hydrant control design should have automatic and manual functions, aiming at the operation of internal monitoring modules in fire prevention areas. The staff shall set up and connect two lines for fire hydrants within the scope, namely, "soft control" and "hard control" as mentioned above, and do a good job of double fire management to ensure the stability and safety of pump valve opening. In addition, automatic information processing connection lines are set to ensure the accuracy of soft control, as shown in Figure 2 below.

(fig. 1 structure diagram of fire alarm monitoring system for fire protection engineering under the construction of network environment)
3.2 Water Distribution Settings

The fire control center can grasp the operation problems of water spraying equipment in the monitoring area in time. This operation system is similar to the traditional fire hydrant operation. However, after the network linkage treatment, the operator only needs to connect the pump valve of water flow voltage to remotely control the water spraying effect.

3.3 Study on Smoke Control and Exhaust Settings

When the temperature is high than 280 DEG C, the smoke-proof valve will be blown at high temperature, thereby realizing the linkage control of module. Considering that the recovery signal is connected with relevant programs through the host computer to realize the operation of smoke control and exhaust fan, the corresponding staff should adopt feasible module analysis and control processing plan. Because the smoke exhaust valve is in an indoor flue gas pipeline movement state for a long time, the processor needs to discharge indoor smoke to the outdoor, and the bus module can be directly connected through the reply signal processing mode, so as to realize the connection of the smoke exhaust fan to run. Because the air supply valve is in the closed places such as elevator front room and independent stairs for a long time, it is necessary to introduce outdoor connected fresh air in time. In addition to the network connection control mode, the project can also be manually controlled by the host computer.

3.4 Emergency Communication Control

Emergency information dissemination control refers to the establishment of a perfect information communication system to ensure that the system can connect urban information systems together. Fixed walkie-talkies are also required in special positions such as the whole water pump room, air conditioning room and elevator control room. Taking the residential area as an example, according to the characteristics of floors and fire-proof areas, several fire-proof branches are set up, each branch is equipped with certain broadcasting equipment, and the volume and wheat can be controlled according to the distance and the flow of people, so as to ensure emergency and rapid crowd dispersal.
3.5 control of alarm device
The alarm device is the necessary equipment of the fire alarm monitoring system, and the whole system is connected with the local alarm module. When a large area fire occurs, more than two fire prevention areas should be connected with an alarm control system with information exchange; For densely populated office buildings and shops, semi-automatic or manual control systems should be designed, as shown in Figure 3 below.

![Alarm device control system](image)

**Fig3 Alarm device control system**

4. Suggestions for promoting the application of fire monitoring system in China's network fire protection engineering

4.1 Reasonable use of technology to reduce the risk of civil air defense
In the past, fire alarm and monitoring were often realized by human operation, while the fire alarm and monitoring system based on network realized the whole fire alarm and monitoring by computer through system setting. In the whole system, the networked equipment can transmit the fire alarm, operation status and fire situation to the monitoring center in time and quickly, and then provide decision-making basis for the fire department to go out to the police quickly by analyzing and processing the data. Therefore, the whole fire alarm monitoring is in a benign operation state of early alarm, timely treatment, quick response, loss reduction and elimination of fire hazards. After the system is started, the network-based fire alarm monitoring system can run continuously to ensure the timeliness of information transmission. Once some fire-fighting facilities are cancelled or closed illegally, the system will automatically make some responses, so that the staff can take some corresponding emergency measures in time, so that the unit can resume the normal operation of the fire-fighting facilities. Its system structure is shown in Figure 4 below.
4.2 adopt intelligent technology to realize scientific fire control

The network-based fire alarm monitoring system for fire protection engineering, as shown in Figure 5 below, is an intelligent management mode with 24-hour monitoring in the whole management process. Often, through the query of records and the backup and recording of data, managers can be well documented in the management and better manage the personnel on duty. Therefore, all fires can be accurately and timely predicted, effectively dealt with, and the effectiveness of work is improved.

5. Conclusion.

To sum up, with the rapid development of China's information technology, the functions of China's fire alarm and monitoring system are becoming more and more prominent. In terms of traditional alarm and monitoring functions, China's modern fire alarm and monitoring system makes rational and scientific use of a large number of network resources, to a great extent, it realizes the integrated design of monitoring, information linkage, regulation, fire prevention and alarm, and improves the construction of urban fire alarm and monitoring system. At the same time, the existing fire monitoring system based on network is constantly being updated. It is hoped that the personnel of the corresponding fire engineering institutions in China will continue to learn in combination with the actual production and promote the all-round development of the urban fire monitoring system in China.
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