

Research on the Construction of Grassroots Emergency Command System Under the Background of Informatization

-- Based on X Fire Station

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Abstract. Along with our economic development and public safety demand intensify., the task of fire rescue team is further expanded, and the construction of fire rescue command system becomes more and more important. This paper takes the information construction of the fire rescue team as the center, and studies the construction of the grass-roots emergency command system, aiming to promote the construction of the fire rescue system and improve the emergency rescue level of the fire rescue team. This paper takes the emergency rescue command system of the special service station of X Fire rescue detachment as the research object, and studies the construction of the basic emergency command system through literature research method and interview investigation methods.

Keywords: Fire rescue; Emergency command; System construction.

1. Introduction

After the fire protection reform, the emergency rescue mission has been further expanded, which is largely due to the substantial increase in the types and frequency of emergencies. The construction of the grassroots emergency management system is the "last mile" of emergency management. We must further strengthen the construction of disaster response capabilities, strengthen risk management, and establish an emergency management system with "unified command, both special and regular, quick response, and top-down linkage" [1] to minimize production safety accidents, natural disasters and related casualties and property losses, and create a safe and stable social environment for the Chinese people.

In recent years, many fields have begun to gradually apply emerging cutting-edge technologies such as functional drones, virtual reality, and the Internet of Things. These technologies have also been gradually applied in emergency rescue missions and have played an important role in improving rescue efficiency. For example, Xu Gang et al. used GIS technology [2] to establish a dynamic fire safety supervision platform for rental housing based on the full integration of geographic coordinates and regional geographic information data. Guo Ruiqing et al. designed and developed laser guidance technology and used geographic information system (GIS) databases for emergency rescue mapping [3]. In order to meet the needs of emergency response, Tang Liang and other scholars developed an emergency management system based on Web GIS, namely a platform system with three modules: "source, connection, and processing" [4]. However, the application of these advanced technologies in the field of fire protection is mostly in its infancy, and there is much room for improvement in the future. Therefore, this paper takes the emergency command system of L Fire Station as the starting point to analyze the relevant issues of emergency command system construction, in order to provide a reference for the construction of grassroots emergency command system under the background of informatization.

2. The Current Status of The Construction and Development of The Emergency Command System of The X Special Service Station

The emergency rescue system emerges and evolves along with the development of the fire rescue team, and the construction of the fire rescue team progresses in line with the continuous advancement of society. The initial application and continuous development of the emergency command system within the fire rescue team keep pace with the global development trend. The information and era of the current society suggest that the functions of fire rescue teams are constantly changing, and meanwhile, higher demands are imposed on the development and application of the emergency command system.

2.1. Preliminary application of the X fire emergency command system

Since 1982, the X fire rescue detachment has established a fire emergency command system and has been incorporated into the Chinese People's Armed Police Force. The X fire department uses computer technology to collect fire data. In 1996, the X Public Security Fire Department established a local network to meet its special needs. It has its own special fire information software, but due to the lack of comprehensive, integrated and organized management, the fire safety computer development at that time could not achieve effective coverage of the emergency command system.

2.2. The leapfrog development of the emergency command system of the X fire station

In order to meet the fire rescue needs of Xilinhot City, the X fire station joined the relevant big data comprehensive operation and management platform to display and publish the most timely and accurate data of the X fire station. And through the police cloud data platform, the data sharing network is continuously improved to promote the sharing of fire data in L City and improve the emergency rescue response level in L City. Since 2015, under the overall planning of the X public security organs, the X fire station has successfully connected to the basic three-level fire safety information network and integrated rich information software into the general command system of X.

2.3. In-depth application of the emergency command system of X Fire Station

By the end of October 2020, the X Fire Brigade will pass the POC test and verify that, according to the system construction technical requirements plan approved by the Inner Mongolia Fire Brigade, it has completed the bidding and procurement of the standardized construction of the intelligent police response system as a procurement requirement. The Inner Mongolia Fire Rescue Corps organized and completed the decision-making analysis and command and dispatch system that supports the corps, detachments, and then fire rescue stations. After forming a mature system, the X Fire Station will prepare for the basic hardware environment of "one map of the city's fire protection" [5] according to the requirements of the detachment.

3. There Are Deficiencies in The Construction of The Emergency Command System of X Fire Station

The ongoing reform and development of China's emergency rescue team is aimed at eliminating numerous deficiencies and contradictions in the construction of the emergency rescue system. Currently, the fire rescue team has just gone through the reform and transition period, and various problems existing under the original system have also been exposed. After the reform and transformation of Xilin Goole Special Service Fire Station, there are still some shortcomings deserving attention and improvement, such as the weak early warning ability of disasters, the difficulty in meeting the demands of emergency rescue construction, and the shortage of professionals.

3.1. Weak early warning capabilities for disasters

Given the particularity of the tasks performed by the fire brigade, these are often inseparable from local public safety, so data from relevant local functional departments such as meteorology, earthquakes and municipal administration are often required. However, the fire department, which was previously affiliated with the army, had relatively difficult information communication with relevant municipal departments. This is mainly because the municipal department and the fire brigade each have a unique internal information system, and the information is all internally circulated. Due to reasons such as confidential information, information communication cannot be achieved through the Internet, and the accuracy and data application are not in place, and the data efficiency is not high. These factors have a great impact on the efficiency of emergency rescue command. In addition, the former fire brigade has led to low skill levels of internal personnel in the team, relatively weak computer skills, and a limited number of personnel available for the emergency management system, which has led to a shortage of personnel who can operate the emergency rescue system.

3.2. It is difficult to meet emergency rescue needs

X Fire Emergency Communication and Mobile Network System is a key component of the emergency management system within the alliance and the largest efficient network system in various disaster response systems, but the system still lacks an integrated and management mechanism for comprehensive disaster response. From the perspective of the construction goal of establishing a comprehensive, all-hazard, full-chain unified response and joint combat platform to provide multiple information such as quantity, type, location, etc. for storage, demand, allocation, social mobilization and logistics distribution, there are still many unreasonable, unclear and undynamic monitoring problems. In addition, there are also problems such as unclear emergency material reserve system, unclear social donation base and management, and duplication or mutual interference of rescue units. There is also a lack of supervision on the management of emergency rescue volunteers. It is also necessary to integrate relevant emergency rescue materials, social emergency forces and collaborative forces, guide the reasonable redistribution of rescue forces, and systematically allocate social donations and emergency reserve materials by improving the emergency communication network.

3.3. Low quality of talents within the team

The fire rescue personnel with older age and lower education in the X fire station find it difficult to adapt to the more complex work platform in the field of computer hardware and computer software systems, and it is difficult to use the information rescue platform to achieve rescue or combat needs. On the other hand, most people are satisfied with maintaining the status quo. Coupled with the stable traditional rescue environment and the slow development of emergency rescue system construction, fire rescue personnel lack the motivation to adapt to new things and the vitality to actively learn, resulting in the coordinated development of emergency rescue system needs and information construction.

4. Research on the Development Countermeasures of The Emergency Command System of X Fire Station

4.1. Build an intelligent command center and early warning capabilities for disasters

Based on the existing emergency rescue system and relying on the "one map" of big data in the whole autonomous region, X will build an intelligent data collection system that matches the emergency rescue system and the construction of the emergency rescue system. Integrate X's basic emergency rescue data and command elements, and encourage areas with conditions to build 3D databases; enhance the operational management capabilities such as data reception of mobile terminals in the emergency rescue system, and realize synchronization, collection, positioning, audio-visual interaction, and emergency management "one map"; combat auxiliary information, including

map digitization set plans, as well as historical cases, personnel equipment conditions, combat position information visualization, rescue equipment status, physical characteristics of commanders and fighters, etc., to realize the visualization of on-site information collection and multi-angle image integration. Pilot development of a new generation of equipment display system based on the Internet of Things, which is used for auxiliary startup, information recording and automatic data collection in rescue operations. At the same time, using the information collected by the intelligent data collection system to generate disaster accident models, and using algorithms to simulate and generate disaster reports that are of reference value to rescue operations, such as disposal points and decision-making suggestions.

4.2. Build an intelligent emergency communication system to meet emergency rescue needs

Strengthen effective coordination and cooperation between relevant government departments within the alliance. Since the city communication coverage continues to use the old wireless communication system to maintain the normal operation of the three-level networking mode, including 350MHz, digital PDT and 800M; in an emergency, the emergency command center and the local emergency service department will cooperate to plan emergency radio frequencies, equip emergency equipment, coordinate with the radio management agency, scientifically allocate frequency resources, and formulate emergency wireless equipment communication plans; reasonably use the 370 MHz resources designated for emergency management to develop an emergency management narrowband wireless communication network; transmit audio and video signals directly to the back-end control center through satellite and mobile communication platforms to achieve remote dynamic control. At the same time, the government and emergency management departments will promptly revise the emergency plan, determine the disaster situation and emergency response needs, determine the emergency rescue professional team, use the combat command headquarters formed by the rescue team as the central hub for collecting images and information at the accident site, and participate in various emergency response-related disaster detection, simulation and early warning monitoring and other work.

4.3. Improve the quality of internal talents in the team

Adjust and optimize the leadership and command mechanism of the emergency command system of the X fire station to respond to emergencies, strictly implement the sense of responsibility of the "top leader", clarify the direction of construction ideas, formulate flexible decision-making mechanisms, optimize the rules of procedure, focus on solving difficult and key points, ensure flexible and efficient decision-making, and improve the effectiveness of the decision-making process. Building a more optimized discussion mechanism and professional team, improving the application, management and emergency communication guarantee capabilities of data, is the core topic of research on the construction of an information system. From leading team decision-making and assisting major project decision-making to promoting the intelligent development of emergency fire management systems, it is feasible and constructive.

5. Conclusion

This paper combines the strategies of strengthening the construction of fire emergency command system with the strategies of informatization and intelligence, and finds three problems in the construction of fire emergency command system: the team in the special service station of X Fire Rescue Brigade has weak early warning ability to deal with emergencies, it is difficult to meet the needs of emergency rescue, and there is a lack of high-level talents. In order to meet these challenges, the fire rescue work of X Fire Station should be led by X Fire Rescue Brigade, refer to the advanced experience of foreign countries and other provinces and cities in China, improve decision-making services, and optimize the emergency communication hub and communication equipment network of the intelligent command center. By optimizing the new emergency response mechanism of the

emergency rescue system and the intelligent data collection system for receiving and handling alarms, the communication ability in emergency situations can be improved, the fire safety information system can be upgraded, the high-level decision-making mechanism process can be optimized, the inspection mechanism can be improved, the communication control mechanism can be strengthened, and the construction of the grassroots emergency command and rescue system can be improved.

However, due to the wide range of data and content involved in the emergency management system, it will involve many functions of the government, which will have a certain impact on the efficiency of the construction of the emergency management system. At the time of writing this article, X Fire Station was in the development period of emergency command system construction. In the future, the emergency command system of the X fire station needs to do more work in combination with its actual situation, conduct in-depth research on various factors such as the combat training system, personnel training, fire safety, etc. for responding to domestic emergencies, expand management points, and explore more comprehensive methods in the information construction of the emergency rescue system.

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