

Application of Intelligent Scenarios in the Operation and Maintenance Supervision of Special Equipment

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Abstract: At present, with the increase in the use of special equipment, the quality level and safety management of special equipment is particularly important, and the construction of intelligent special inspection is of great significance. The application of intelligent management scenarios can efficiently solve the safety problems in the use of special equipment, effectively curb the occurrence of accidents, and realize the normalization and intelligence of safety supervision. Subsequent exploration and practice can be carried out accordingly to better promote the scientific and technological research and application work in the field of special equipment. This paper analyzes in this regard.

Keywords: Intelligent scenario; Special equipment; Operation and maintenance supervision

Introduction

With the whole society to special equipment safety concerns and higher requirements, how to get out of the dilemma, and further reduce the accident rate has become a new period of China's special equipment safety regulatory authorities are facing a huge challenge. China's safety regulation mainly lies in the government's implementation of safety regulation. Regulation in economics refers to the market economy, the government in order to correct market failure, the realization of the social public interest and in accordance with the law and the rules of the microeconomic subject to implement a series of direct or indirect intervention, management and supervision of behavior, is divided into economic regulation and social regulation of 2 categories. Safety regulation is an important social regulation, special equipment safety supervision should be dominated by administrative means of the traditional regulatory model to the government safety regulation model, that is, the legal and economic means of supervision model.

1. Special equipment safety regulation connotation

According to economics, in the absence of the necessary constraints, the market by itself is unable to solve some important problems related to economic development and the social good, and government regulation is recognized as a necessary means to overcome the negative consequences of market failures. With the public's concern for health, safety and environmental issues such as social issues, as an important part of government regulation, safety regulation (safety supervision) is increasingly important. Special equipment belongs to the production and living areas are widely used in high-risk equipment, improper use can cause group deaths and injuries of vicious accidents, and account for a large proportion of special equipment safety accidents. Special equipment accidents will not only cause great harm to the victims, but also cause serious negative impact on social stability and even the authority of the government^[1]. At the same time, due to the higher threshold of professional knowledge, a considerable part of the users of special equipment lack of sufficient professional knowledge and risk awareness. Negative externalities and information asymmetry phenomenon in the field of special equipment is more serious, therefore, do a good job of special equipment safety supervision, to ensure the safe operation of special equipment is an important public management responsibilities of the government. Special equipment safety supervision that is the government of special equipment to implement the safety regulations, refers to the government regulatory agencies (special equipment safety supervision departments) based on relevant safety laws and regulations, through administrative licensing, testing and inspection, safety supervision and administrative penalties and other acts, the production and operation of enterprises involved in the safety of special equipment production and operation behavior to supervise, inspect and deal with, in order to ensure that the workers, in particular, the operation of special equipment, To ensure the safety and health of workers, especially the operation and use of special equipment, a kind of social regulation. The intelligent scenario of special equipment operation and maintenance supervision integrates modern information, equipment control technology, big data fusion intelligent algorithms with special equipment technology to find out the relevant laws behind a large amount of information on equipment operation status, and arrive at an efficient, safe and environmentally friendly equipment safety operation path^[2]. Intelligence is not only related to equipment and personnel data collection,

data transmission and processing and automation system integration, but more to use big data, artificial intelligence technology, respond to the equipment environment and various changes in the operation process, make intelligent decision-making support, effective management of special equipment system, focusing on highlighting the use of cloud computing, Internet of Things, artificial intelligence, big data and other technologies to solve the special equipment operation and maintenance. It emphasizes the use of cloud computing, Internet of Things, artificial intelligence, big data and other technologies to solve the efficiency, safety and efficiency problems in the operation and maintenance of special equipment.

2. Application of Intelligent Scenarios in the Operation and Maintenance Supervision of Special Equipment

2.1 Visualization information service platform construction

Arrangement of 5G base station and signal enhancement module, can effectively avoid the inspection instrument to collect data cumbersome procedures, so as to improve the reliability of the inspection data; low-power features to solve the power supply problem of the portable integrated inspection tool, convenient for inspectors to carry, improve inspection efficiency. Therefore, the information service platform of the data source there is diversity, such as through online monitoring, inspection personnel mobile sensory data, institutional cooperation data access, etc., all the special equipment [boilers, pressure vessels, pressure piping, elevators, cranes, passenger ropeways, large amusement rides, plant (field) within the special motor vehicles] included in the dynamic management of the platform can be the practical situation of the equipment, inspection The situation, including information parameters, the use of detailed information in a timely manner to monitor the unit, the use of cloud technology will be multi-channel data through the network for unified centralized storage, analysis and further development, to achieve resource sharing, through the system focuses on the existence of problems or over the cycle of inspection of special equipment in a timely manner for early warning and notification of the community and the regulatory authorities. At the same time, the data center is compatible with the service platform, you can effectively integrate the equipment of the appointment inspection and printing reports through the network, etc., the formation of both the effective management of special equipment and inspectors, but also to provide information services to customers and the community platform.

2.2 Driving and Social Benefits of Intelligent Scenarios

The establishment of a big data service platform allows online monitoring of special equipment with functions such as visual health diagnosis of regulatory information, fault early warning analysis, operation and maintenance reminders and recommendations, and safety rating of special equipment. The functional role of the big data center includes: (1) accident early warning, strengthen the incident, after the fact supervision; (2) to facilitate the market-oriented management of testing organizations; (3) to promote the optimization of inspection function institutions; (4) according to the comprehensive status of equipment operation, to further guide the inspection cycle; (5) to enhance the transparency of the equipment to the manufacturers and maintenance companies to make ratings, to the community to notify the community, and in turn, to form a with the perception, interconnection, analysis, Prediction, decision-making early warning and other intelligent scenarios of special equipment inspection management model.

2.3 Intelligent management scenario in the context of 5G technology

The implementation of online real-time inspection and maintenance through the Internet of Things remote monitoring system or remote inspection and maintenance through video and other information technology means, which puts forward urgent requirements for the safety supervision and inspection of special equipment. The development of industrial equipment intelligence and the 5th generation mobile communication technology (5G) for vertical industry intelligent applications provide an opportunity to solve this problem. Intelligent scenarios highly simulate artificial behavior, through the visual, auditory, tactile, gustatory perception of special equipment operation, the use of 5G communication technology (a network) on the operation of special equipment characteristics of the parameters of the transmission of the background database through the fusion of multiple sources of data to form a unified operation and maintenance supervision platform (a map), and post-processing of the data and development, the formation of a centralized analysis of the big data center, combined with the video graphical Analysis and positioning, released through the cloud platform, so that the realization of expert video-assisted operation and maintenance and inspection platform possible; management can be on the special equipment operation and maintenance departments and inspectors to carry out a full range of efficient management, the real realization of a centralized command, “zero” delay in conveying information, real-time inter-departmental linkage, so as to unify the instructions, unified rescue, Unified investigation, unified analysis, the formation of full coverage of special equipment intelligent operation and maintenance management mechanism.

Conclusion

In summary, in recent years, the factors affecting the safety of special equipment are more diversified and coupled, and the elements of

safety risk prevention and control of special equipment are more and more risky. Intelligent scenario technical characteristics are built on the basis of digital technology, the use of modern wisdom concepts to complete the various types of special equipment inspection and management of all information accurate and timely collection, standardized integration, network transmission, intelligent diagnosis and early warning, visualization and display, intelligent services and so on.

References

- [1] Xu Chao. Analysis of the application of artificial intelligence technology in special equipment inspection and testing[J]. China equipment engineering,2020(07):172-173.
- [2] FU Tiehua, CHEN Xianfeng, ZHANG Guoan. Internet + digital transformation in special equipment inspection and management of practice and thinking[J]. China Special Equipment Safety,2020,36(04):5-7.