The Development and Application of the Management System of Labor Protective Clothing with the Help of Computer

QuanQuan Gong*, LianKe Xie, DanDan Dou, Kun Wang, YuWei Zang
State grid Shandong electric power research institute, Jinan 250003, Shandong, China

*Corresponding author e-mail: 61908058@qq.com

Abstract. With the development of information technology and automation technology to realize the automation and intelligence of the labour protection service management system, the development of the computer-aided labour protection service management system is inseparable from scientific and reasonable system analysis and design, which will have a decisive impact on the effectiveness of the whole system. This paper first analyzes the function model of the computer-aided management system of labour protection clothing, then studies the online acquisition of data information of the management system of labour protection clothing, and finally analyzes the function realization and key technologies of the management system of labour protection clothing.

Keywords: Computer, Management System, Labor Protective Clothing

1. Introduction
With the prosperity and development of social economy and market, the demand for labour protection clothing is increasing, and the traditional management mode of labour protection clothing is not suitable for the market demand[1-2]. On the other hand, with the rapid development of information technology and its popularization and application, the management mode of labour protection service is becoming more and more information-based and digital, and the requirements for the comprehensive management of labour protection service information are becoming higher and higher. However, most of the current labour protection service management systems are still based on the relatively static information model, which will produce a lot of sampling data information in the process of processing. Therefore, in the process of equipment condition monitoring and diagnosis, there will be a lot of management lag phenomenon, which is difficult to ensure the reliability of the labour protection service management system[3-4]. Therefore, it is of great practical significance to realize the development of the management system of labour protection service to the direction of automation and intelligence based on information technology and automation technology, and to study the development of the management system of labour protection service under the assistance of computer.
2. The function model of the management system of the labour protective clothing under the help of computer

2.1. Management system function model

The labour protection service management system mainly realizes the overall and appropriate management of the whole process information of the service cycle of the enterprise's production labour protection service, such as the account and state maintenance of the labour protection service, and generates the statistical analysis report, so as to provide the accurate basis for the production planning departments at all levels to supply and guarantee the labour protection service, so as to assist the enterprise in the decision-making analysis of its supply resource system[5-6]. Due to the objective existence of the regional distribution and functional differences of the production and relevant management departments of labour protection clothing in the enterprise, as well as the different requirements for the phased processing of the operation information of labour protection clothing, such as screening and classification, extraction and processing, the overall hierarchical distribution of the system is determined. Based on the physical topology of the field bus of the labour protection service unit and the internal LAN of the enterprise, and through close integration with the enterprise resource information data exchange centre, the overall function model of the labour protection service management system as shown in Table 1 below is proposed.

| Function model          | Function details                                                                 |
|-------------------------|----------------------------------------------------------------------------------|
| Account management      | Track and query, and provide basic support information                           |
| Operation management    | Record summary and report output operation status to provide decision reference for subsequent maintenance and transformation |
| Maintenance management  | Realize the automatic generation of the management plan of labour protection clothing and the intelligent management of the state maintenance of labour protection clothing |
|                         | Through the attribute association between labour protection clothing and spare parts, we can ensure that the labour protection clothing can meet the demand and reduce the inventory of labour protection clothing |
| Spare parts management  | Property values of life cycle, maintenance cycle, etc                            |
| Management of technological |                                                                                  |

2.2. Detailed functional requirements

It is the fundamental guidance of system design to make clear and clear the functional requirements of the labour protection clothing management system with the help of computer. The first step of system design is to clarify the system requirements. All requirements in the system are numbered and recorded to standardize all requirements. In addition, since the data processed by the computer-aided labour protection service management system is the key data of daily operation based on the computer-aided management, higher requirements are put forward for the computer software and hardware environment. In order to ensure the long-term safe, stable, reliable and efficient operation of the system, it should meet the specific detailed requirements as shown in Figure 1 below.
3. Acquisition of data information of labour protection clothing management system

3.1. Acquisition means of data information for labour protection clothing management system
The common on-line information collection of the labour protection service management system mostly adopts the multi-sensor method. After monitoring the process and environmental information of each single target from the outside of the labour protection service management system, the status information of the labour protection service management is transformed through data fusion. Therefore, there are inevitable problems such as sensor calibration, multi observation fusion processing algorithm in time and space, and it is difficult to achieve the accuracy and real-time standards. In addition, the access right to the underlying network of the labour protection service management system, whose network performance can be predicted and determined in time, can meet the real-time requirements of the labour protection service management system network. Moreover, the network nodes on the bus can not only receive the information sent to this node, but also listen to all the data frames transmitted on the network, which is the premise and foundation for the realization of online information acquisition of the labour protection service management system.

3.2. Data information module structure and process
First of all, the main functions of the computer-aided labour service management system module are not only information addition, maintenance and other functions, but also the computer-aided management module functions, as well as data operation safety tracking and so on. Secondly, the function of the user data operation tracking module of the labour service management system provides the system administrator with the tracking function of all user operations, which provides users with the functions of automatic adding and querying data records and deployment records.
Figure 2. The structure and flow of data information module

Besides, when the user misoperates, resulting in data confusion, the function of recovering data manually and investigating the user's responsibility and facilitating the user to view the current management and operation status records of labour protection clothing. In addition, the structure and flow of data information module are shown in Figure 2.

4. The function realization and key technology of the management system of the labour protection clothing under the help of computer

4.1. The interface design of the management system of labour protective clothing with the help of computer

First of all, in order to log into the computer-aided management system of labour protection clothing, users must verify and pass their own identity. Therefore, it is necessary to assign code to each user to represent the unique identity and provide the development result information. Secondly, after the user logs in successfully, he/she will enter the function interface of the computer-aided labour protection service management system, and judge which operation authority the user has through the weight value of the user. The user authority is recorded by the authority table in the database, and the user authority is divided according to the following weights. In addition, after the user logs in successfully, enter the labour protection clothing warehousing interface, and click the corresponding menu to record, classify, modify, report damage, delete and report related management operations for the size, model, manufacturer and other information of the labour protection clothing. The interface can manage the configuration of labour protection clothes, display the information names of all the available labour protection clothes in the database, save the management data, and set the information properties of labour protection clothes.

4.2. The key technology of computer aided management system of labour protection clothing

First of all, it needs to be applied to the transceiver management technology to solve the problem when multiple users operate on the same data and prevent other users from modifying the data in another unfinished transaction. Secondly, the database connection technology makes the relevant node information into the form of connection string to realize the access to the database and the maintenance of the computer-aided labour service management system. In addition, the key technologies of the computer-aided labour service management system also include the control technology, the technology of setting the connection library, the technology of adding the field display, the technology of editing the control, and many properties and methods of the database.
control, so as to realize various convenient operations on the database of the computer-aided labour service management system.

5. Conclusions
The development of the computer-aided management system of labour protection clothing is inseparable from the scientific and reasonable system analysis and system design, which will have a decisive impact on the effectiveness of the whole system. In this paper, from the perspective of information and automation of the computer-aided management system of labour protection clothing, the function model of the computer-aided management system of labour protection clothing is constructed, and the interface design and key technologies of the computer-aided management system of labour protection clothing are studied. And through the on-line acquisition of data information of the labour service management system, the supply status and utilization rate of the labour service can be reliably guaranteed and improved, which further improves the standardization, scientization and modernization of the labour service management.

Acknowledgement
This work was supported by Science and technology project of State Grid Corporation of China (Design and development of labor protective clothing system for power supply enterprises).

References
[1] Guo Fei, Zang Baohua, Han Xiumei. Design and implementation of social insurance management system based on mixed mode [J]. Fujian computer, 2012 (05).
[2] Li Menghui, Tian Lei. Discussion on social insurance management system [J]. Labor and social security world (theoretical Edition), 2013 (07).
[3] Liu Neimei. Development and application of computer aided management system [J]. Value engineering, 2001, 10:78-82.
[4] Guo Xi. Research on computer database management system [J]. Computer CD-ROM software and application, 2010,5, 56-57.
[5] Kuang Kongwu, Wang Xiaomin. Information system analysis and design (3 editions) [M]. Beijing: Tsinghua University Press, 2006.
[6] Miao Qingfeng. Discussion on informatization of labour insurance management, business manager [J], 2011.17.