

Influencing factors of elevator safety performance and strategies to strengthen elevator inspection and testing

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Abstract: With the rapid development of China's social economy, people's living conditions are also constantly improving, in China's current urban development, basically all buildings are equipped with elevators to facilitate people's daily travel. However, some problems will inevitably occur during the use of elevators, and elevators due to their characteristics, once there is a problem, there may be casualties. Therefore, in the current social development, more and more attention is paid to the safety performance of elevators, and the elevator must pass the performance test before use, and the safe elevator can be put into use. However, the performance testing of elevators also has certain influencing factors, and it is precisely these influencing factors that lead to the unstable detection of elevators, so in the current social development, it is necessary to strengthen the inspection and testing of elevators to ensure the safety and stability of elevators in use.

1. Introduction

With the current rapid development of urbanization in China, the number of high-rise buildings in the city is also increasing, and elevators have become the standard of high-rise buildings, the use of elevators not only meets the application needs of high-rise buildings, but also facilitates people's work and life to a certain extent. However, due to the characteristics of elevator use, this also makes the elevator in use may appear some safety hazards, so the elevator must be regularly tested during use, only the elevator that passed the test can be put into normal use, the elevator testing process will also affect the test results due to some factors, so in the current elevator testing process must also strengthen the inspection and testing link, through the strengthening link to truly avoid the factors affecting the elevator detection, so as to ensure the scientific rationality of the elevator testing and inspection results.

2. Various Factors that Endanger the Safety Performance of Elevators

2.1 The Carrying Capacity of the Elevator

Many regions have begun to use elevators to meet the needs of residents going up and down the stairs, but elevators in different regions are also strictly different in terms of passenger use, and if the elevator is overloaded during use, it may cause problems in the operation of the elevator. Overload has always been an important factor affecting the accuracy of elevator inspection, many elevators are also due to overload problems caused by some safety hazards, so in order to effectively solve the relevant factors affecting elevator detection, the first thing to set up for the elevator to prohibit overload signs, to prevent elevators due to overload caused by potential safety hazards.

2.2 Early Regulatory Elements

Elevator as a special use of equipment, elevator every day to go through large-scale use, and long-term elevator use will also make the elevator appear a certain degree of wear, and elevators generally have professional staff to supervise responsible, but in China's current management has been a lack of supervision, especially in the operation of the elevator in the process of basically few professional staff will supervise, only after the elevator problems, there will be professional staff to supervise and maintain the elevator. Due to the lack of supervision, the elevator cannot be effectively rescued in the first time when something goes wrong, and it is precisely because of the lack of supervision that it is difficult for the elevator to accurately find the problem and solve the problem in the detection process, which also has a certain impact on the normal use of the elevator.

2.3 Maintenance Cost Elements

The elevators used in the interior of the house are basically maintained and managed by professional responsible personnel after installation, and most of the elevators used in residential areas are managed by property management personnel ^[1]. However, in China's current elevator management, many properties will rarely manage the elevator in the cycle time due to cost, and this situation makes the elevator often have some problems after a long period of work. Due to its special characteristics, once there is a problem, it is likely to affect the life safety of the occupants, and it is precisely because of the maintenance cost of the elevator that it is difficult to find accurate results in the detection process, so in order to effectively solve the elevator safety hazards, it is first necessary to solve the maintenance cost of the elevator.

3. Problems in Elevator Inspection and Testing

3.1 Inspection and Testing Work is not in Place

The elevators used in the building basically have relevant testing processes, especially the elevators used for a long time, which must be tested according to the specified time, and the smooth operation of the elevator is guaranteed through testing, and only the elevator without any problems with the test results can be put into normal use. However, in the process of elevator use in China, there is often a phenomenon that the detection work is not in place, according to the relevant laws and regulations of the national elevator safety production, it can be seen that the elevator construction enterprise needs to carry out professional inspection and testing work after the elevator carries out capital construction, the operation of the elevator, carry out professional inspection and testing work, and in the process of elevator inspection and testing, the elevator inspection and testing report is

systematically described, so as to grasp the key points in the elevator inspection and testing work. However, according to the specific operation status of the elevator at this stage, it can be seen that some inspectors have not carried out inspection and testing work in place when testing the elevator, and the inspection report depicted in the inspection elevator also has many problems such as a single content, which promotes the frequent occurrence of elevator inspection and testing errors.

3.2 The Implementation of Self-Inspection Work Cooperation is not in Place

Many elevators will be tested according to the specified time before starting, but the elevators in some communities are rarely tested during use, which makes the elevator detection work unable to be in place, and the elevator users cannot effectively know the safety of the elevator, especially the elevator may appear aging damage during long-term use, which will cause more serious safety hazards to the use of the elevator. Personnel engaged in elevator inspection and testing related work must carry out inspection and testing work in the elevator inspection link, according to the requirements of on-site inspectors, but combined with the actual situation, elevator personnel in the process of maintenance and inspection, there are often engineering construction personnel in the process of mutual cooperation and implementation, inspector quality to be improved and many other problems. The main factors causing this problem are manifested in the following two aspects: First, because with the gradual increase in the number of elevators, many companies are forced to accelerate the installation rate of elevators, and in this process, the significance of self-inspection work will be ignored, which may lead to elevator quality will not be ensured [2]. Second, in the process of elevator self-inspection, some personnel will describe specific content in the elevator self-inspection report without carrying out self-inspection, so that the authenticity and accuracy of the content of the self-inspection report cannot be guaranteed.

3.3 Inspection Causes Safety Problems

In the process of elevator inspection and testing, in addition to encountering many problems such as poor inspection and testing work, self-inspection work cooperation and other problems, it will also cause a series of safety problems because of the imperfect elevator inspection and testing. That kind of elevator in the detection process is easy to lack of posting safety warning signs, so that some unwitting personnel still use the elevator, in the process of use caused by elevator fall or elevator interruption and other phenomena, will cause a serious threat to the life safety of elevator passengers. Elevator inspection process should also strengthen management, if the elevator in the inspection process lack of management, will also cause more serious safety problems.

4. Strengthen the Strategic Analysis of Elevator Inspection and Testing

According to the problems existing in elevator inspection and testing, it is mainly through the optimization of the environment to improve the performance of the elevator. Start with supervision to improve the smooth performance of the elevator. Starting from the inspectors, reducing elevator safety accidents and other aspects, the idea of strengthening elevator inspection and testing is carried out at a deeper level.

4.1 Improve the Performance of Elevators from the Optimization Environment

Elevator in the detection process first need to solve the use of the elevator problem, many elevators in the process of use completely ignore the carrying capacity of the elevator, which makes the elevator in the process of use often due to overload problems caused by problems, and the emergence of this

problem will also cause a certain degree of impact on the detection of the elevator. In order to effectively strengthen the accuracy of the detection results in the elevator detection process, first need to solve the elevator riding environment, by solving the elevator riding environment. It really improves the performance of the elevator, and also avoids the possibility of potential safety hazards in the elevator through detection.

4.2 Start from Supervision to Improve the Smooth Performance of Elevators

In the inspection process of the entire elevator operation equipment, its content includes safety parts, system testing, etc., and in the elevator operation link, if there is a problem caused by the elevator automatic control system, it will affect the operation of the elevator in the middle and late stages, such as: the more common elevator fault power circuit short circuit fault problem. In view of this, elevator inspectors need to start from supervision, and then improve the stability performance of the elevator, in order to improve the actual effect of elevator inspection, mainly by improving the method of abnormal process of short circuit fault system, to ensure the soundness of the line short circuit basic inspection process. In addition, the performance of the elevator can also be inspected by establishing a supervision department to ensure the safety factor of the elevator in use.

4.3 Start from the Inspection Method to Ensure the Efficient Operation of the Elevator

First of all, we start from four aspects: estimation inspection, slide rail non-destructive testing technology, environmental noise detection, and instantaneous speed inspection to ensure the high efficiency of elevator operation. First, estimation test. The estimated inspection method means that the inspectors have rich work experience, and then in the process of elevator operation, according to the estimation and detection methods, the influencing factors that endanger the smooth operation of the elevator are analyzed. Second, environmental noise detection. The noise inspection and testing method refers to the application of scientific and reasonable inspection methods to test the noise that occurs during the operation of the elevator. The sensor for noise inspection needs to be installed at a height of 1.5 meters above the ground, and the elevator can be inspected and tested in the form of multi-anchor noise detection. Third, instantaneous speed detection. Under normal circumstances, the detection of elevator operating rate is dominated by the three stages of operation, braking system and vibration, at the same time, in the elevator operation link, there will also be vibration acceleration and capacity operation acceleration situation replacement, and the operating frequency of elevators in different tracks is not the same.

4.4 Start with Inspectors to Reduce Elevator Safety Accidents

With the current social development, elevator safety hazards continue to occur, the current society is also paying more and more attention to elevator safety testing, so there is currently a shortage of inspectors in China's elevator testing work. Elevator testing staff need to undergo a long time of training to be put into the post, but due to the current lack of staff, this also makes some enterprises in China lack professional elevator maintenance personnel and inspectors, and the emergence of this situation makes the elevator inspection link appear more influencing factors^[3]. Therefore, in the current elevator inspection work, first of all, we must strengthen the professional quality of the staff, especially the property and the elevator management staff in various regions must strengthen the professionalism of the inspectors, through the strictest scientific testing, reduce the possibility of elevator safety hazards, truly eliminate the probability of elevator safety hazards, and also ensure the smooth operation of the elevator through scientific testing.

5. Conclusions

All in all, the use of elevators not only facilitates people's travel to a certain extent, but also realizes the construction of urbanization to a certain extent, but due to the characteristics of elevators, there is a certain danger in the use of elevators. Therefore, only the elevator can be put into normal use after reasonable inspection, and the elevator in the testing process, due to a variety of factors, may affect the accuracy of the test results, so in the current elevator testing process, it is necessary to strengthen the management of the detection link, focus on solving the various factors affecting the elevator detection, and truly ensure the accuracy of the elevator testing results.

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