

Original Research Article

Application of Electromechanical Installation Construction Technology in Practical Engineering

Zichuan Huang*

Hengtai Mechanical and Electrical Co., Ltd. E-mail: zichuang@163.com

Abstract: Nowadays, with the continuous development of economy and society, the frequency of electromechanical installation projects in various industries is getting higher and higher. With the continuous improvement of mechanization level, the requirements for business personnel engaged in mechanical and electrical installation engineering are getting higher and higher. Electromechanical installation is a very important part in construction engineering. Only through continuous innovation, technical renewal and transformation, can the engineering function be effectively guaranteed and the economic benefit be increased. As urban construction enters the fast lane, people's requirements for the quality of life are gradually improved. The installation of construction electromechanical projects is the most prominent link in construction engineering, so construction units should pay attention to the installation of engineering electromechanical projects. The emphasis of engineering electromechanical installation is the control of installation quality and the innovation of installation technology. Based on the author's practical experience, this article first emphasizes the necessity of electromechanical installation, and then explains the relationship between construction engineering and electromechanical installation in combination with engineering practice, aiming at emphasizing the irreplaceable role of electromechanical installation in construction engineering.

Keywords: Construction Engineering; Electromechanical Installation; Risks

1. Introduction

Electromechanical installation engineering is an important part of construction engineering, and the industries involved in it cover the whole daily life of people. Including the installation of various equipment, electrical, water supply and drainage, heating, ventilation, fire protection, communication and automation control systems in industrial, civil and public works. The construction activities of mechanical and electrical installation project cover all stages of equipment procurement, installation, commissioning, trial operation, completion acceptance, *etc.* The ultimate goal is to meet

the functions of buildings.

2. Overview and characteristics of the project

The electromechanical installation project is an important part in electromechanical engineering industry. In order to explain the general situation and characteristics of the installation project more clearly, the following examples are given. A university built a comprehensive office building with a total area of about 100,000 square meters, with 1 underground floor and 18 floors above ground. The main contents include HVAC, water supply and drainage, electrical and equipment inst-

allation and other installation projects. The characteristics of this project are embodied in the following points.

2.1 Large quantities and wide cooperation

A major feature of general university projects is short construction period and heavy tasks, and construction personnel from various industries need to work at the same time, which requires close cooperation between personnel from various industries. In addition, civil engineering, decoration and electromechanical installation are carried out at the same time, resulting in the scene of large area, multi-discipline and large number of people simultaneously carrying out construction. Although it is only a simple building, considering the short construction period, it is necessary to consider the external shape, internal layout, structural structure, internal and external decoration, material practices, equipment and construction requirements of the building at the same time.

2.2 High technical requirements and crossed operation

During the construction process of the project, there are many phenomena of large area, many people rushing to work, and crossed construction at the same time. Therefore, it is necessary to do a good job in cooperation with the owner, the general contractor, civil engineering and various electromechanical specialties, and create a good construction atmosphere. As mentioned above, there are a large building area and high floors in the comprehensive office building built in this project. Large-area material transportation and aerial work are necessary working methods. This project is a super high-rise building, and loading and transporting electromechanical equipment and materials is one of the key links in electromechanical construction.

3. The risks of installation project construction

3.1 The national safety standard system needs to be improved

For the construction of electromechanical installation projects, China has formulated relevant safety standards, but on the whole, it is not perfect. The standards involved are very wide for electromechanical

equipment, and there are many product types, such as large towers, compressors, steel structures, and pressure pipes. In the installation process of large-scale tower, it is necessary to consider whether the hoisting environment, weather, subgrade, rigging and crane's lifting model number are consistent with the weight and shape of the equipment. Coupled with the continuous development of science and technology and economy, production activities are becoming more and more frequent. All production activities should put safety first, and only in this way can the safety of mechanical and electrical installation project construction can be ensured. The mechanical and electrical safety production standards are relatively comprehensive, but there is an obvious problem that the provisions are not consistent with the actual production. It will lead to inconsistency between the mechanical and electrical production requirements and the status quo, resulting in the construction unit failing to smoothly construct. Therefore, it is necessary to improve the safety standard system, and formulate standards and specifications in line with the actual situation, so as to enhance the effectiveness of the construction of electromechanical installation projects.

3.2 Backward management thinking

In the construction of mechanical and electrical installation projects, there is still a problem of backward management ideas. If this problem is not taken seriously by the construction units, it will virtually form a safety risk. For example, the construction unit doesn't pay much attention to the safety problems existing in the compressor. When the compressor equipment fails, it is simply repaired. As long as the compressor can work again, the potential safety hazards of the equipment are not thoroughly inspected, which will cause the equipment to fail again in a short time. In the construction of electromechanical installation project, the operation and management of electromechanical equipment are complementary to each other. The construction unit must update the previous ideas and put safety first when installing electromechanical production. If the construction unit only pays attention to production and neglects safety, instead of improving the construction quality, it will cause many safety accidents in the installation process, thus reducing the installation quality and bringing unnecessary troubles.

3.3 Imperfect detection technology

Detection technology plays an important role in the construction of electromechanical installation projects. It can find many hidden dangers in the installation and formulate effective prevention strategies, so as to predict the problems and faults in electromechanical equipment, take precautions in advance and contain the problems in the bud. During the installation of pressure pipes, due to many historical reasons, many construction units still use traditional pressure pipes. These pressure pipes have been running for many years, and may have been aging for a long time. They will fail soon after running, and even if they continue to run, the final effect is not good. However, it is obvious that some construction units are not aware of the importance of upgrading pressure pipes, and think that they only need to buy them again, without paying attention to the safety inspection link. Then many pressure pipes with faults enter the construction site, which seriously restricts the installation work.

3.4 Low professional quality of construction personnel

From the current situation of electromechanical installation project construction, the professional quality of construction personnel does not meet the actual needs. The group in close contact with the project is construction personnel, whose construction level and quality directly affect the quality of electromechanical installation project. Construction workers are also one of the sources which may bring safety risks. Many construction workers go to work directly without professional training, which will bring potential safety hazards to construction. Mechanical and electrical installation work is mostly carried out in the plant area or workshop, and the construction risk coefficient of each specialty is higher, with high requirements for construction personnel. Most construction workers of electromechanical installation projects are manual workers, and their education level is not high. Although they also have safety awareness during construction, their domain is relatively poor. Many construction workers learn from the past to gain safety awareness. Only by strengthening training can the construction units thoroughly enhance their safety awareness.

4. The application of construction technology of electromechanical installation in construction engineering

Construction plan of this project mechanical and electrical installation operating point is scattered. In the actual construction between the installation type of work, the interaction and cooperation between each installation project and civil construction work is particularly critical. After comprehensive analysis, the installation work can be divided into three stages and six processes. The three stages are as follows. (1) In the initial stage: to closely cooperate with civil engineering to complete the pre-embedding and reservation work. (2) Installation stage: with the civil engineering structure handing over the site one after another, substantive construction will be carried out. (3) Commissioning and acceptance stage: each sub-item workload should be basically completed in the installation stage, which is the key stage of the whole installation work. The six construction processes are as follows. (1) Cooperate with civil structure construction to complete the pre-embedding and reservation work. Complete prefabrication, inspection and testing of materials. (2) Pipeline laying (about electricity); Main pipe installation (about water); Air duct hoisting (about air conditioner). (3) Electrical box installation (about electricity); Branch pipe installation (about water); Distribution duct installation (about air conditioner). (4) Installation of equipment, lamps and sanitary ware and air outlets. (5) System test and equipment commissioning. (6) Prepare for acceptance and completion, and assemble technical data for completion.

5. Management strategies for safety risks in mechanical and electrical installation project construction

5.1 Improve the safety management standard system

In the construction practice of electromechanical installation project, it is necessary to strengthen the optimization of safety management standards on the original basis, abandon and destroy the inapplicable standards, and supplement the effective management standards. In this way, not only can the construction

personnel have laws to follow, but also the safety management concept can be well publicized and promoted, avoiding the confusion between the old and new standards. After the safety management standard system is completed, it must be implemented in the whole construction process to play a management role. It is necessary to organize the equipment and materials used in the installation, and improve the self-management of construction personnel. The construction unit can also formulate a reward and punishment mechanism to punish the construction personnel who do not comply with the safety management standard system, thus playing a deterrent role. Although this management method is mandatory, it is an effective means to improve the construction safety of electromechanical installation projects. Only by making front-line construction personnel aware of the necessity and importance of self-safety, can they complete production and protect themselves. In addition to construction personnel, on-site management personnel and leaders must abide by safety management specifications, equip with safety protection articles and protective facilities as long as they enter the construction site. Those who fail to follow the rules should be punished according to the management standard system, and leaders are no exception. So that the leaders can play a leading role and realize the production concept of "everyone is in charge of safe production and management".

5.2 Reduce production safety hazards

In the construction of electromechanical installation project, it is necessary to minimize the potential production safety hazards, so as to ensure the reliability of the project construction. In addition, the current industry is increasingly dependent on the use of electromechanical equipment. Only by improving the construction safety can the value of electromechanical equipment be brought into play. In order to improve the safety, efficiency and quality of the industry, it is necessary to ensure the correctness of mechanical and electrical equipment installation, control the quality of the whole installation process, control all potential safety hazards and escort the safe production.

5.3 Strengthen the inspection and maintenance of mechanical and electrical equipment

First of all, in the maintenance of electromechanical equipment, while testing the lubrication system and operating space, attention should also be paid to the testing of large towers, as well as the testing of the braking protection, travel limit and other equipment of electromechanical equipment. Secondly, the accuracy of mechanical and electrical equipment must be tested by professionals in order to find out the potential safety hazards and ensure the performance of mechanical and electrical equipment.

6. Conclusion

In this project, the quality defects put forward by users will be investigated within several months after the completion of the project, and the modification scheme and technical measures will be worked out. With the consent of the owner, effective and free services will be provided in a timely without affecting the construction and production, thus ensuring the project quality.

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