

Construction Safety Management of Mechanical and Electrical Installation Projects

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Abstract: Various industries today rely on the support of electromechanical equipment, expanding its scope of application and leading to an increase in electromechanical installation projects. However, due to the high level of expertise required and the potential risks involved, it is crucial to emphasize safety management during construction. This paper delves into the significance of construction safety management for electromechanical installation projects, identifies common problems encountered during construction, and proposes solutions. This analysis aims to provide relevant personnel with essential guidance and references for managing electromechanical installation projects safely.

Keywords: Construction safety; Mechanical and electrical installation; Installation engineering; Engineering projects; Safety management

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1. Introduction

Mechanical and electrical installation projects are complex engineering projects. The construction involves advanced science and technology, such as automation control, software, computer information, and electronic technology. Engineering project construction is highly systematic, but certain safety hazards can occur during the process. The quality and safety of mechanical and electrical engineering have an important impact on preventing issues faced during construction. Mechanical and electrical installation companies must emphasize safety management to prevent accidents. Engineering construction companies need to investigate and solve various safety hazards promptly.

2. The importance of construction safety management of mechanical and electrical installation projects

Safety management plays a crucial role in mechanical and electrical installation projects as they can be risky. It is vital to mitigate hidden safety hazards and decrease construction risks. If proper safety management is not implemented during the construction period, or if there are any loopholes, it can result in a series of accidents,

such as electric shocks, fires, and power outages, which can severely impact the progress of a project. Hence, mechanical and electrical companies must prioritize improving safety management awareness and efforts. Safety management should be performed comprehensively to enhance the safety and reliability of mechanical and electrical engineering installation. The lack of safety management may cause economic losses or casualties, ranging from financial compensation to legal issues and corresponding legal liabilities ^[1]. At this point, safety management is of great significance. Mechanical and electrical installation in construction must strictly prioritize safety first to prevent various safety risks.

3. Analysis of construction management issues of mechanical and electrical installation projects

3.1. Weak safety management awareness

Some companies have a weak awareness of personnel safety management during the construction process of electromechanical installation projects. This will affect the safety management plans of electromechanical installation, disrupting the smooth flow of construction. Since electromechanical installation is hazardous, if the construction personnel have weak safety awareness, they will not only lack relevant measures for self-protection but may also engage in illegal or dangerous behaviors during the installation and construction process, which may cause casualties with minor or even severe injuries ^[2]. Safety accidents related to the construction of mechanical and electrical installation projects in recent years are all related to the weak safety awareness of personnel. Experienced personnel disregarding the importance of personal safety and the construction site lacking corresponding safety protection can easily cause safety accidents. In addition, the safety management awareness of some companies' management is relatively weak. Safety education for the early stages of mechanical and electrical installation in construction should also be emphasized

3.2. Lack of professional safety management talents

Mechanical and electrical installation projects are highly complex, as construction needs to meet a certain scale and cycle. During the project construction, safety management must be done throughout the entire process. If the professional safety management talents within the company are lacking or mediocre, safety management on mechanical and electrical installation will be impacted ^[3]. Thus, the recruitment methods for professional safety management talents in the company's human resources management department must be improved. Even if safety management personnel are recruited, the quality of safety management personnel may be affected by low recruitment requirements or the company lacking a proper professional talent training system.

3.3. Low level of safety supervision

There is a phenomenon of low supervision levels in construction safety because some mechanical and electrical companies lack attention to safety management. Mechanical and electrical installation projects are relatively complex, so there are various safety hazards during construction. Safety management personnel may become lax or lazy over time due to a lack of supervision ^[4]. Safety supervision is important for improving the safety of mechanical and electrical installation projects. It is also an effective way to check whether safety management is standardized. Most mechanical and electrical companies have not yet established a dedicated safety supervision department for construction sites. In addition, some regulatory agencies overly emphasize construction progress while ignoring construction safety, which would disrupt the work of the safety supervision team in safety management. Moreover, some safety supervision teams lack an understanding of relevant laws and regulations, which results in their work being in vain and of no practical significance.

3.4. Lack of safety management system

There are many kinds of safety hazards in mechanical and electrical installation projects in construction such as human operation hazards and natural hazards. No matter what kind of safety hazards, their prevention and mitigation require guidance from standardized safety management systems. However, imperfect safety management systems exist in electromechanical installation projects because some companies lack attention to safety management. This is detrimental to the standardized development and advancement of safety management-related work. The lack of institutional regulation on work behavior can easily increase the probability of human safety hazards. At the same time, the lack of systems will also affect the evaluation of the quality of safety management work. Since the safety management of mechanical and electrical installation has certain norms and standards, the implementation of relevant safety protection measures needs to comply with relevant legal regulations. This system can provide a reference for safety management evaluation so that construction site safety managers can understand the shortcomings of safety management ^[5].

4. Research on construction management strategies of mechanical and electrical installation projects

4.1. Improve safety management awareness

Given the high risks involved in constructing electromechanical installation projects, it is crucial to improve the safety awareness of project participants since everyone has a responsibility to manage safety. During the early stage of project construction, mechanical and electrical companies need to organize safety education and training for project participants, explaining mechanical and electrical safety knowledge and related operating precautions in detail. At the same time, they also need to educate various safety protection measures on the construction site to improve personnel's attention to safety management ^[6]. The safety education carried out should focus on the comprehensiveness and pertinence of the educational content and explaining relevant national laws and regulations, corporate rules, and systems in detail, to improve legal awareness and safety awareness of construction personnel. Additionally, the especially dangerous operations involved in mechanical and electrical installation construction should only be performed by professionals while supervised by safety managers to avoid accidents, casualties, or economic losses caused by temporary personnel negligence ^[7]. Enterprises can also regularly carry out safety education activities and mobilize all personnel to participate in safety management work to improve safety management awareness.

4.2. Cultivate professional security management talents

The construction of mechanical and electrical installation projects is dangerous and some special operations need to be completed by professionals, especially regarding safety management, which is directly related to the safety of the construction site and the quality of project construction ^[8]. To this end, mechanical and electrical companies must focus on cultivating professional and highly skilled safety management talents by regularly organizing training in theoretical knowledge and management skills to create good opportunities for them to enrich their management experience ^[9]. The companies should also raise the recruitment threshold appropriately to improve the quality of talents recruited. On the other hand, improvement of talent training systems should be focused on cultivating high-quality and comprehensive management talents in a standardized manner according to the training system.

4.3. Improve the level of safety supervision

The supervision of safety management work is also an important part of safety inspection and safety hazard

investigation. Safety supervisors not only supervise the development situation and promote safety management but also check for possible methods to further improve the performance and safety of mechanical and electrical installation projects. First, supervisors need to clarify the goals of safety supervision and conduct regular or sudden inspections of safety management work. Safety hazards discovered must be dealt with promptly and the relevant persons in charge must be punished accordingly to serve as a warning to others. Secondly, a special safety supervision department or supervision group should be established to improve the safety supervision process and procedure of mechanical and electrical installation^[10]. Finally, knowledge of laws and regulations should be kept up to date. Project management needs to take into account both construction progress and safety management and ensure the two complement each other by actively supervising them.

4.4. Establish and improve safety management systems

The importance of safety management to the mechanical and electrical installation projects is self-evident. Improving safety management levels, increasing supervision capabilities, and cultivating professional safety management talents all require the guidance of a safety management system^[11]. Thus, mechanical and electrical companies must focus on constructing and improving safety management systems. The companies also need to emphasize the legality and compliance of the safety management systems by constantly updating the contents to prevent out-of-date information. Moreover, companies should establish a safety management responsibility system so they can pursue accountability and handle incidents promptly to reduce unnecessary losses. Managers should ensure that workers perform their duties properly to avoid illegal and dangerous behaviors^[12].

5. Conclusion

There are great safety risks in mechanical and electrical installation projects in construction. If safety management is not prioritized during construction, it will not only be detrimental to the prevention and timely response to safety risks but will also increase the risk of and threaten the personal safety of construction workers. Currently, there are many problems in safety management in mechanical and electrical installation projects, such as lack of safety management awareness, professional safety management talents, safety supervision level, and safety management systems. Mechanical and electrical companies must focus on cultivating professional safety management talents and improving personnel safety management awareness and supervision levels. It is also necessary to establish and improve a safety management system to improve the safety of mechanical and electrical engineering projects.

Disclosure statement

The author declares no conflict of interest.

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