

# Innovation Strategy of Construction Safety Management Mode in Civil Engineering

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**Abstract:** In recent years, the continuous improvement of China's national economic level has promoted the continuous development of the construction industry. The development of the construction industry has also promoted the increase of civil engineering projects and the R & D and application of relevant construction technologies. However, the safety problem of civil engineering construction has always existed, and safety management has always been the primary problem that the construction industry needs to deal with. Combined with the concept, characteristics and existing problems of civil engineering safety management, this paper will put forward the corresponding innovation strategy of construction safety management mode, in order to strengthen construction safety management and promote the further development of civil engineering construction.

## 1. Introduction

Driven by the rapid development of domestic social economy, various industries have made obvious progress, especially the civil engineering industry has made very obvious progress. Safe construction can be said to be the most critical work of all construction projects, and has received extensive attention from people from all walks of life. People's demand for architecture has also changed greatly, that is, it has gradually changed from practicability to aesthetics and functionality. The change of this idea makes the construction structure of civil engineering more and more complex, and also makes the safety management mechanism change significantly, which has become a key work in civil engineering construction. Nowadays, the form of civil engineering safety management in China is relatively simple, and compared with other developed countries, a lot of safety management work is on paper, which can not be prevented from dangerous accidents in engineering construction. Therefore, it is a general trend to innovate the construction safety management mode so as to ensure the healthy development of domestic civil engineering industry.

## 2. Concept and Characteristics of Civil Engineering Safety Management

Civil engineering construction safety management, as an extension of the functions of safety production management organization of construction enterprises, participates in the whole process of civil engineering construction management and is an important part of the enterprise civil engineering construction management system. Its main management objectives are personnel safety, equipment and facilities safety and engineering product reliability. Civil engineering construction safety management adopts systematic safe production technology management methods to manage the investment of materials, manpower, equipment and facilities, so as to ensure the safe production of civil engineering.

Civil engineering safety management has the following characteristics. First, liquidity. The civil engineering construction itself is static, but the construction team needs to select the construction site according to the specific situation of the project. With the progress of construction technology, there are more and more influencing factors, which further increases the fluidity of construction. Construction requires a large number of personnel, most of whom are migrant workers. Because of the particularity of the working environment, migrant workers themselves have high mobility. Second, density. Compared with foreign countries, the labor intensity of China's construction

industry is higher. Therefore, it presents the characteristics of labor-intensive. In addition, because civil engineering has a long construction cycle and requires a lot of labor in the whole construction process, the working space of each construction worker is relatively limited, resulting in significant intensity of the project. Third, complexity. Due to the great differences in the development of various regions in China, the financial strength, technical level and scale of civil engineering construction enterprises in different regions are uneven, resulting in significant complexity in the process of safety management. Moreover, in the construction process of civil engineering, it often needs the joint participation of multiple construction parties, which increases the difficulty of construction management.

### **3. Existing Problems of Civil Engineering Construction Safety Management**

#### **3.1. Imperfect Safety Management System**

At present, China's civil engineering construction safety management is not paid enough attention, the role of safety management is not fully played, and various safety management systems and norms are not perfect, which directly affects the specialization and scientificity of safety management. In order to complete the management task on time, the construction unit did not arrange special safety management personnel, which not only affected the construction of safety management system, but also led to the lack of safety awareness of the whole construction team.

#### **3.2. Weak Safety Awareness**

Due to the imperfection of the system, the staff pay too much attention to the technology and ignore the safety regulations, resulting in various high-altitude operations and mechanical hoisting do not meet the safety operation specifications, and the construction unit does not configure a safety commander, which have buried great potential safety hazards on the construction site. Project subcontracting often occurs in civil engineering construction. In order to reduce costs, some units lack investment in safety management and do not configure necessary safety prevention facilities, which is not conducive to the life safety of constructors. For example, some construction units do not provide safety equipment such as safety helmets, labor protection gloves, insulating shoes and safety ropes for construction personnel, which increases the harmfulness and destructiveness of safety accidents, resulting in casualties and huge property losses.

#### **3.3. Lack of Market Supervision**

The government is mainly responsible for supervising the order of the construction market and the behavior of the construction industry. However, at present, some local governments do not implement the spirit of the national construction industry safety management documents and the spirit of the meeting, and do not convey relevant policies in time and lack executive power, resulting in insufficient supervision of the civil engineering construction management market. In addition, some regulatory departments have imperfect regulatory measures and single regulatory means, and often use surprise inspection or comprehensive inspection, resulting in various corruption problems. In addition, some governments separate the power of management from the power of administrative punishment, which can effectively restrict corruption, but it is not conducive to the improvement of work efficiency to a certain extent.

### **4. Innovation Strategy of Civil Engineering Construction Safety Management Mode**

When innovating the safety management mode, the construction unit needs to actively learn from the advanced management mode of other enterprises, improve and optimize it in combination with its own current situation, and establish its own safety management mode under the requirements of relevant laws, regulations and safety specifications, starting from the following aspects.

#### **4.1. Establishing and Improving Safety Management System**

Attention should be paid to the above problems of imperfect and nonstandard safety management system. Safety management specifications and safety production guidelines should be formulated according to the project cycle, progress and participants, so as to promote all personnel to consciously practice various safety management regulations. After establishing the safety management system, the enterprise needs to scientifically guide the construction personnel according to the system to ensure that the construction personnel adhere to their post responsibilities and actively communicate and cooperate. Enterprises need to ensure the effective implementation of the safety management system according to various reward and punishment mechanisms, supervision and inspection mechanisms and control means, so as to raise the safety management system to the strategic guidance of the enterprise and refine it to all process links, especially high-altitude operation and other dangerous operation links. Enterprise technicians need to give full play to their responsibilities, find and report problems in the system in time, and formulate prevention strategies according to potential safety hazards.

#### **4.2. Strengthening the Construction of Safety Management Culture**

By taking the construction of safety culture as the core of the enterprise and strengthening the safety management culture, we can finally improve the safety management level of the safety management personnel through the construction of safety culture. Moreover, the enterprise also needs to strengthen the investment in all aspects of safety management, such as capital, human and material resources, strengthen the construction of safety management team, equip sufficient safety materials and safety equipment according to the actual needs of civil engineering construction, and improve safety facilities. In addition, the construction unit also needs to enrich investment channels and obtain more project financial support. The safety management personnel and cost control personnel need to strengthen control when allocating and using funds, so as to ensure the effective implementation of enterprise safety training and safety protection, and finally ensure the safety of civil engineering construction and reduce the incidence of safety accidents.

#### **4.3. Enhancing Personnel Safety Awareness**

The civil engineering construction unit needs to make every effort to do a good job in the safety management training, education and publicity of construction personnel, management personnel and responsible personnel, so as to deeply implement the safety management in all construction links, operation procedures, operation specifications and supervision and management. On the one hand, enterprises need to strengthen the safety training of construction personnel (see Figure 1). Through the development of scientific and perfect training mechanism and on-the-job training system, they need to carry out special training for personnel at all posts, and regularly evaluate the training results, linking the evaluation results with performance salary. Especially for rural personnel, they need to carry out safety management education from the level of theoretical knowledge and professional skills. On the other hand, enterprises also need to strengthen the business ability assessment of managers, supervisors, technicians and other personnel, and quantify the assessment results as the standard for the practice effect of safety management. In addition, enterprises also need to formulate a reporting system and safety supervision system to promote mutual supervision among employees and timely report illegal practices, so as to strengthen the safety management awareness of the engineering team and finally prepare for the innovation of safety management mode.



Figure 1 Safety training for construction personnel.

#### 4.4. Strengthening Government Functions

For the problem of insufficient market supervision, the government should strengthen the supervision function, improve the supervision of civil engineering construction, and ensure that the government carries out safety management in accordance with national laws and regulations and safety specifications. It is also necessary to change the concept of market regulation and law enforcement, and strengthen the cooperation of social law enforcement departments. In addition, it is also necessary to regularly train a group of qualified and capable supervisors to carry out supervision by adopting normal working methods. Law enforcement departments and construction enterprises themselves also need to establish regulatory awareness and strengthen regulatory behavior. They should strengthen the investigation of potential safety hazards in the construction site and working procedures, and formulate a potential safety hazard control system. They should timely analyze potential safety hazards through supervision records, and formulate targeted prevention strategies and solution strategies on this basis, so as to completely eliminate potential safety hazards and strive to achieve early detection, early prevention and early resolution. For example, for units with safety problems caused by violations, corresponding penalties can be imposed by restricting their investment qualification, revoking their business license, reducing their qualification, cash fines, restricting construction, etc. Adopting the above methods can strengthen the awareness of safety responsibility, strengthen the effect of safety management, and finally ensure the effective implementation of safety management mode.

#### 4.5. Strengthen Emergency Management

Accidents encountered in civil engineering construction are sudden, hidden, continuous and unpredictable. Therefore, enterprises need to build an emergency rescue system, establish an emergency mechanism, do a good job in emergency management, control construction safety accidents to the greatest extent, and reduce casualties, property losses and on-site damage caused by safety accidents. Enterprises can regularly carry out emergency rescue drills, formulate and adjust various emergency plans and improve emergency measures according to the changes of the external environment and the construction site, so as to strengthen the emergency awareness of construction personnel and improve the self-protection ability of construction teams. For each sudden accident, the enterprise needs to strengthen reflection and reconnaissance, grasp the core points of each emergency plan, timely record the processing process, and finally form an emergency rescue report in the reflection and summary, so as to ensure the rescue ability of the construction team.

### 5. Conclusion

In a word, the characteristics of civil engineering itself determine the inevitable existence of construction safety accidents and potential safety hazards, but they can be solved through scientific and effective safety management. Therefore, the civil engineering construction unit needs to treat the potential safety hazards scientifically, innovate the construction safety management mode on the basis of grasping the construction characteristics and construction laws, and provide guarantee for the efficient implementation of safety management.

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