Discussion on Implementation Measures for Safety Responsibilities in Construction Engineering Supervision

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Keywords: Construction Engineering; Supervision Safety Responsibility; Measures

Abstract: With the rapid development of China's construction industry, the scale of engineering construction continues to expand, and construction safety issues have become increasingly prominent. As a key link in ensuring engineering safety, the implementation of safety responsibilities in construction engineering supervision is directly related to the smooth progress of engineering construction and the safety of personnel and property. This article analyzes the main content of safety responsibilities in construction engineering supervision and proposes specific implementation measures, aiming to enhance the effectiveness of implementing these responsibilities and providing theoretical reference and practical guidance for promoting the safe and healthy development of the construction industry.

1. Introduction

Currently, China's urbanization process is steadily advancing, the number of construction projects continues to grow, engineering structures are becoming increasingly complex, and construction difficulties are constantly increasing. Consequently, the associated construction safety risks have significantly risen. As an independent third-party institution entrusted by the construction unit, the supervision unit carries out supervision and management of the entire construction process in accordance with laws and regulations, engineering construction standards, and contract agreements. Safety supervision is one of the core contents of supervision work. Therefore, in-depth research on the core content of supervision safety responsibilities and exploration of scientific and feasible implementation measures are of great practical significance.

2. Main Content of Safety Responsibilities in Construction Engineering Supervision

2.1 Safety Review Responsibility in the Pre-construction Phase

The pre-construction phase is the foundational stage for ensuring engineering safety. The supervision unit must fully perform its safety review duties. First, the supervision unit must strictly verify the qualification conditions of the construction unit, focusing on reviewing the legality and validity of its qualification certificates and work safety permits. If issues such as incomplete qualifications or expired certificates are found, the supervision unit should promptly provide feedback to the construction unit and require the construction unit to rectify within a specified period. Construction is strictly prohibited if rectification fails to meet standards. Second, the supervision unit must strictly control the safety compliance of the construction plan. For the safety technical measures in the construction organization design, it should organize professionals to review whether they comply with the mandatory standards for engineering construction and whether they are adapted to the actual characteristics of the project and the risks of the site environment. For particularly hazardous parts and sub-projects such as deep foundation pit support and high-formwork support, the special construction plan must undergo strict review, and expert demonstration should be organized if necessary. Construction is not allowed until the plan is

  DOI: 10.25236/icacel.2025.185

approved [1]. Finally, verify the implementation of safety preparation work at the construction site, including the compliance of the temporary electricity plan, the acceptance status of construction machinery and equipment, the allocate of safety protection devices, and the quality compliance of safety protection appliance. At the same time, the supervision unit also needs to review the establishment of the construction unit's work safety management system and the implementation of the work safety responsibility system, ensuring that the construction unit has clarified safety responsibilities for each position and has full-time staffing work safety management personnel with corresponding professional capabilities as required.

2.2 Safety Supervision Responsibility During the Construction Process

Safety risks are relatively concentrated during the construction process. The supervision unit needs to continuously perform its supervision duties to prevent and control safety hazards. On the one hand, supervision personnel should carry out regular or irregular safety inspections at the construction site based on the supervision plan and detailed supervision rules. Key check includes whether construction personnel strictly operate according to safety technical measures and special construction plans, and whether they comply with on-site work safety regulations. For example, the wearing of safety protection equipment, the presence of illegal command and to operate a machine contrary to its instructions, etc. If violations are found, they must be stopped immediately, and the construction unit must be required to rectify within a time limit. For serious violations of work safety regulations that may cause safety accidents, the supervision unit has the right to issue an order to suspend work. Work can only resume after the construction unit has rectified the issues and passed re-inspection by the supervision unit. On the other hand, supervision personnel need to proactively identify safety hazards at the construction site and track their handle. For common risk types such as deep foundation pit collapse and scaffolding instability, problems should be identified promptly, and written rectification notices should be issued, clearly stating rectification requirements, completion deadlines, and specific responsible persons. The entire rectification progress should be tracked, and re-inspection should be organized to ensure that safety hazards are completely eliminated. If the construction unit refuses to rectify or fails to meet rectification requirements, the supervision unit must promptly report to the construction unit and the construction administrative department [2]. At the same time, supervision personnel need to supervise the construction unit's implementation of safety education and training, verify the conduct and actual effectiveness of special training for new personnel and special operation personnel, check the mount guard certificates of special operation personnel, and strictly prohibit unlicensed personnel from engaging in special operations. Additionally, they should supervise the construction unit to regularly organize emergency drills to test the feasibility and pertinence of emergency plans and enhance the ability of construction personnel to handle proruption safety accidents.

3. Measures for Implementing Safety Responsibilities in Construction Engineering Supervision

3.1 Strengthen the Construction of the Supervision System

The supervision system is the core framework for standardizing supervision behavior and ensuring the implementation of safety responsibilities. Therefore, supervision units need to strengthen construction from two dimensions: system construction and execution guarantee. On the one hand, supervision units should formulate a system covering the entire process of safety supervision based on current industry norms and their own business practices. This specifically includes a safety supervision work process system, a post responsibility system, and a risk

prevention and control system [3]. Among them, the safety supervision work process system needs to clarify the operating standards for each stage of pre-construction review, whole-process supervision, and accident handling. For example, refinement the time limit requirements and process nodes for the review of special construction plans, and clarify the frequency standards and recording norms for safety inspections. The post responsibility system needs to further break down the safety responsibilities of the chief supervision engineer, professional supervision engineers, and supervision personnel to avoid responsibility overlaps or regulatory gaps, ensuring that each post has clear safety supervision objectives. On the other hand, establish a dynamic optimization mechanism for the system. With technological innovation in the construction industry, relevant policy adjustments, and changes in safety risk types, supervision units should regularly evaluate the applicability of existing systems. Based on problems discovered in engineering practice, newly issued laws and regulations, and lessons learned from typical safety accidents, they should promptly revise and improve the system content to ensure that the supervision system from beginning to end aligns with industry development trends and safety supervision needs, providing stable and scientific system support for the continuous implementation of supervision safety responsibilities [4].

3.2 Innovate Supervision and Management Methods

With the continuous development of the construction industry and the steady improvement of technological levels, traditional supervision and management methods can no longer meet the actual needs of implementing supervision safety responsibilities. There is an urgent need to further improve supervision efficiency and overall horizontal through technological innovation and mechanism improvement.

First, supervision units can build an information platform specifically serving construction engineering safety supervision, incorporating the entire process of safety supervision work into platform management. Supervision personnel can use the platform to upload key materials such as safety inspection records, rectification notices, and work suspension orders in real time, achieving digital storage of supervision work traces. The construction unit and the construction administrative department can then retrieve engineering safety supervision data in real time through the platform, effectively breaking down information communication barriers and enabling dynamic monitoring and remote management of supervision work [5]. At the same time, relying on the data analysis function of the information platform, systematically collect and deeply analyze data related to construction engineering safety, accurately identify common problems and potential vulnerabilities in safety management, provide solid data support for optimizing safety management policies and improving supervision measures, and promote the transformation of supervision decision-making models from experience-driven to data-driven.

Second, comprehensively deploy intelligent monitoring equipment at the construction site, covering key risk areas such as deep foundation pits, high formwork, lifting machinery, and on-site working environments. Such equipment can conduct 24-hour uninterrupted real-time monitoring of the safety status of the construction site. Once abnormal parameters or safety hazards are detected, it can immediately automatically issue early warning signals, achieving early identification and timely warning of safety risks. Supervision personnel can view on-site images and monitoring data in real time through the remote monitoring system without frequently traveling to the construction site, greatly reducing the workload of on-site inspections while significantly enhancing the ability to detect hidden and sudden safety risks.

In addition, the complete monitoring data recorded by intelligent equipment can serve as objective evidence for safety accident investigations and responsibility determination, ensuring the

fairness and efficiency of the accident handling process.

3.3 Strengthen Coordination and Cooperation Among All Parties

The implementation of safety responsibilities in construction engineering supervision cannot be achieved without the collaborative efforts of multiple entities such as the supervision unit, the construction unit, and the construction unit, working together to create a stable and orderly work safety environment. Relying solely on the unilateral efforts of the supervision unit makes it difficult to achieve comprehensive safety management ensure.

First, as the initiator and overall management main body of the project, the construction unit needs to carry out earnestly work safety management responsibilities and provide necessary support for the supervision unit to carry out safety supervision work. In the entrustment supervision contract, the boundaries of the supervision unit's safety supervision authority and responsibilities should be clearly defined to ensure its ability to independently carry out supervision activities. Interference with the normal safety supervision work of the supervision unit is strictly prohibited. At the same time, supervision fees must be paid in full and on time to ensure that the supervision unit has sufficient funds for purchasing safety monitoring equipment, organizing safety training for supervision personnel, etc. In addition, the construction unit also needs to strengthen its control over the construction unit, urge the construction unit to strictly implement its primary responsibility for work safety, provide construction conditions that meet safety standards for the construction unit, and promptly coordinate and resolve various issues affecting work safety during the construction process [6].

Second, as the implementation main body of on-site operations, the construction unit needs to actively cooperate with the safety supervision work of the supervision unit and consciously accept supervision and management. It must strictly organize construction according to the construction organization design and special construction plans approved by the supervision unit, and must not take the liberty change the content of the plans. During the construction process, it needs to promptly report construction progress and on-site safety conditions to the supervision unit. For rectification requirements raised by the supervision unit, specific rectification measures must be formulated, completion deadlines must be clarified, and results must be promptly feedback to the supervision unit after rectification is completed.

Third, the supervision unit needs to proactively build a communication bridge with the construction unit and the construction unit, establishing a optimum cooperative relationship. It should regularly report the progress of safety supervision work to the construction unit, truthfully feedback existing safety hazards and rectification situations at the construction site, and put forward professional improvement suggestions. When communicating with the construction unit, it should both adhere to the principles of safety supervision, strictly perform supervision duties, and also pay attention to communication methods to avoid unnecessary conflicts and contradictions caused by improper communication.

3.4 Strengthen the Construction of the Supervision Team

Supervision personnel are the direct executors of supervision safety responsibilities, and their professional accomplishment and business ability directly determine the actual quality of safety supervision work. Therefore, strengthening the construction of the supervision team and improving the professional quality of personnel is particularly critical.

First, strictly standardize the access mechanism for supervision personnel. Supervision units should strengthen the overall management of the supervision qualification examination, appropriately increase the difficulty and evaluation standards of the examination to ensure that

those who pass have a solid theoretical foundation and basic practical ability for safety supervision. At the same time, strictly review the work experience and past performance of candidates to be hired, priorities personnel with rich construction engineering experience and safety supervision practical experience. For special operation supervision posts, it is also necessary to clearly require practitioners to possess corresponding special operation knowledge and skills, and they must hold professional qualification certificates to work [7].

Second, systematically strengthen the education and training of supervision personnel. Supervision units should formulate perfect education and training plans based on their own physical truth, regularly organize supervision personnel to carry out special training on safety knowledge, safety technology, relevant laws and regulations, etc. The training content must be closely integrated with the development trends of the construction industry and the actual needs of on-site work, highlighting practicality and pertinence. For example, focus on strengthening safety supervision knowledge training for new types of projects such as deep foundation pits, high formwork, and prefabricated buildings, and effectively enhance the ability of supervision personnel to deal with complex engineering safety issues. In addition, supervision personnel should be actively encouraged to participate in exchange activities and continuing education courses organized by industry associations to help them update their knowledge structure in a timely manner and continuously improve their professional level.

Third, establish and improve the assessment and incentive mechanism for supervision personnel. Supervision units should regularly conduct comprehensive assessments of supervision personnel from dimensions such as work performance, professional ability, and professional ethics. The assessment results should be directly linked to salary treatment, professional title promotion, and post adjustment. Those who perform outstandingly in safety supervision work and successfully avoid safety accidents should be timely commended and materially rewarded. Those who are derelict in their duties and fail to perform safety supervision responsibilities should be subjected to criticism and education, demotion and salary reduction depending on the severity of the circumstances. Those with serious circumstances should be dismissed in accordance with laws and regulations. Through scientific assessment and incentives, the work enthusiasm and initiative of supervision personnel can be fully mobilized, and the level of safety supervision work can be comprehensively improved [8].

4. Conclusion

The implementation of safety responsibilities in construction engineering supervision is key to ensuring construction safety and reducing safety accidents, and is of great significance to the healthy development of the construction industry. During the construction process of construction engineering, to fully leverage the safety responsibilities of supervision, optimization and improvement must be carried out from four aspects: perfecting the system construction, innovating supervision methods, strengthening multi-party coordination, and strengthening team construction. With the development of the construction industry and technological progress, the implementation of supervision safety responsibilities will face new challenges and opportunities. In the future, supervision units need to continuously pay attention to new industry dynamics, continuously optimize implementation measures, promote the construction industry to move in a safer, more efficient, and sustainable direction, effectively improve the level of implementation of supervision safety responsibilities, and ensure engineering construction safety.

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