



Research on Safety Management Problems and Their Countermeasures in the Construction Process of Hydropower Building Projects

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Abstract: As the infrastructure of the national economy, hydropower architectural engineering plays an important role in promoting social and economic development and improving people's living standards. However, in the process of construction, the existence of safety management problems seriously threatens the smooth progress of the project and the personal safety of construction workers. The purpose of this paper is to deeply discuss the safety management problems encountered in the construction of hydropower architectural engineering, and put forward corresponding solutions.

Keywords: hydropower architectural engineering construction, safety management, countermeasure

1. Introduction

In today's society, hydropower architectural engineering is an important part of national infrastructure construction, and its safety management in the construction process is particularly important. With the continuous expansion of project scale and the continuous progress of technology, the potential safety risks in the construction process are also increasing. Therefore, it is of great practical significance to deeply study the safety management problems in the construction process and put forward effective countermeasures for ensuring the smooth progress of the project, ensuring the life safety of the construction personnel and improving the quality and benefit of the project.

2. Basic principles of safety management during hydropower architectural engineering construction

2.1 Accident prevention as the principle

In the construction process of hydropower architectural engineering, accident prevention is the primary principle of safety management. By identifying and analyzing potential hazards in advance and developing and implementing effective preventive measures, accidents can be nipped in the bud, thus minimizing their occurrence. This requires the construction unit to establish a sound safety management system, strengthen safety education and training for construction personnel, improve their safety awareness and operation skills, and ensure the effective implementation of various safety measures in the construction process [1].

2.2 The principle of ensuring personal safety

Personal safety is the core of safety management in the construction process of hydropower architectural engineering. During the construction process, the life safety of construction workers must always be put in the first place to ensure that they are not harmed during the operation. Therefore, the construction unit should provide labor protection articles that meet safety standards, set up necessary safety protection facilities, strengthen safety supervision of the construction site, and timely discover and eliminate potential safety hazards. At the same time, a sound emergency rescue mechanism should be established, so that the accident can be rescued and dealt with quickly and effectively when it occurs.

3. Safety management issues during the construction of hydropower architectural engineering

3.1 Project design and evaluation are not rigorous

In today's engineering projects, imprecision in the design phase and inadequate evaluation can lead to a series of serious problems. The unreasonable design may cause structural instability, which not only affects the overall safety and stability of the project, but also brings potential safety hazards. For example, improper material selection or structural layout can lead to damage to buildings and even collapse during extreme weather conditions. In addition, the inadequate evaluation work may have a negative impact on the construction progress and project quality, and may even cause the project to need to be

reworked or delayed, thus causing huge economic losses and reputation damage. The lack of effective supervision and supervision is one of the important reasons for lax design and evaluation, which may lead to the failure to discover and correct design defects and potential safety hazards in time. Therefore, in order to ensure the smooth progress of the project, we must pay attention to the work quality in the design and evaluation stages, strengthen supervision and supervision, and ensure that every link meets the safety and quality standards. At the same time, the introduction of third-party review and public participation can further improve the transparency and reliability of engineering design and evaluation, thus safeguarding public safety and interests [2].

3.2 There are many subcontracting phenomena in the construction process

The widespread subcontracting phenomenon may have a negative impact on the quality of the project, because those units that take over subcontracting may not have the necessary technical and management capabilities required to complete the project. In addition, subcontracting may also increase the overall risk of the project, because the subcontracting relationship is often complicated and the attribution of responsibility is unclear, which will make it extremely difficult to investigate responsibility in the event of safety accidents. Further, subcontracting may lead to more unsafe behaviors of workers during operation, because the subcontracting unit may not give sufficient safety training and education to workers, which makes workers may lack necessary safety awareness and correct operation skills during operation.

3.3 Project safety planning is incomplete

When carrying out the project, if the safety planning is not comprehensive enough, it may lay potential safety hazards during the construction process, and even lead to accidents. This situation is often due to the lack of pertinence and operability of safety planning, which fails to fully consider the specific characteristics of the project and the particularity of the construction environment. For example, if a construction project ignores the risks of aerial work and fails to formulate detailed safety regulations for aerial work, then in actual construction, workers may face the danger of falling due to lack of necessary safety measures. In addition, incomplete safety planning may also lead to insufficient safety investment, resulting in imperfect safety protection facilities, such as the lack of necessary safety nets and protective railings, which may become the inducement of accidents. At the same time, inadequate safety management and supervision, such as the lack of regular safety inspections and training, will also make workers lack the ability to respond to emergencies, thus increasing the possibility of accidents. Therefore, the safety planning of the project must comprehensively consider various potential risk factors, formulate practical safety measures, and ensure that these measures are strictly implemented to ensure the life safety of construction workers and the smooth progress of the project.

4. Solutions to safety management problems during the construction of hydropower architectural engineering

4.1 Timely improvement and perfection of the preparatory work in the pre-construction stage

Before the start of the construction project, it is very important to improve and perfect the preliminary preparatory work in time. This step is fundamental to ensuring that the entire project goes safely and smoothly. It is not only related to the smooth development of the project, but also has a decisive influence on the success of the whole project. This involves many aspects, including but not limited to further improvement of engineering design, strengthening project evaluation and supervision, formulating detailed safety plans and construction plans. Through these measures, potential safety risks can be effectively prevented, and possible problems can be controlled during the construction process. In addition, timely updating and optimizing the preparatory work in the pre-construction stage can also help improve the project efficiency and reduce unnecessary delays and costs, thus ensuring the successful completion of the entire project. At the same time, it is also conducive to improving the collaboration efficiency of the team and ensuring that each member can clarify his own responsibilities and tasks, so as to communicate and coordinate more smoothly during the construction process [3].

4.2 Strict control and safety management of project commencement and acceptance

In order to ensure the quality of the project, the start-up and acceptance of the project must be strictly controlled and safely managed. Before the project starts, a detailed qualification review and safety inspection must be carried out on the construction unit to ensure that the construction unit not only has the necessary technical and management capabilities, but also can comply with relevant safety specifications and operating procedures. In addition, the preparatory work before the start of construction, including the formulation of construction plan and the review of construction plan, should also be fully paid attention to to ensure that the project can proceed smoothly according to the established plan. After the completion of the project, the acceptance process is equally crucial. At this time, comprehensive and detailed inspection and evaluation of

project quality should be carried out, including but not limited to structural safety, material quality, construction technology, etc. During the acceptance process, it should be ensured that all engineering details meet the requirements of design drawings and relevant standards. In addition, the acceptance work should also include the review of various records and reports produced during the construction process, such as safety inspection records, quality inspection reports, etc., to ensure that every link of the project meets the expected quality standards. Only by passing such strict acceptance can the project be recognized as qualified, thus ensuring that the final project delivered for use can meet the functional and safety requirements.

4.3 Establish relevant systems for safety management and adhere to standardized safety management

In order to ensure the smooth progress of engineering projects and the safety of personnel, it is very important to establish a perfect safety management system. This includes not only the formulation of detailed safety management systems and operating procedures, but also the formulation of emergency plans so that emergencies can be responded quickly and effectively in case of emergency. Furthermore, it is indispensable to clarify the safety responsibilities and safety requirements of personnel at all levels, which helps ensure that each employee is clear about their safety responsibilities. At the same time, we should also adhere to standardized safety management, which means following certain industry standards and best practices to ensure the uniformity and effectiveness of safety measures. By promoting advanced safety management experience and technology, we can continuously improve the overall safety management level, thus providing a solid guarantee for the success of engineering projects and the safety of employees [4].

4.4 Improve safety protection facilities

In modern building construction, safety protection facilities play a vital role, and they are an important means to ensure the safety of workers. In order to ensure that every worker on the construction site can work in a safe environment, a series of meticulous measures must be taken to improve the safety protection facilities according to the specific characteristics of the project and the actual situation of the construction environment. This includes not only setting up strong safety nets to prevent falling objects from causing injuries to workers, but also installing comprehensive protective railings to prevent workers from falling accidentally. In addition, eye-catching warning signs should be arranged in every potentially dangerous area of the construction site to remind workers to be vigilant at all times. The setting of these safety facilities can effectively prevent and reduce the occurrence of safety accidents and build a solid line of defense for the safety of workers' lives. At the same time, the maintenance and inspection of safety protection facilities should be strengthened. Regular maintenance and inspections can promptly detect and repair damage to the facility, ensuring that it is always intact and operating effectively. This requires not only a professional maintenance team, but also the active participation and supervision of every worker. Through continuous maintenance and inspection, we can provide a more solid guarantee for the safety of workers, allowing every worker to work in a safe environment, thereby improving the work efficiency and morale of the entire construction team. The improvement of safety protection facilities is not only a respect for workers' life safety, but also a reflection of project quality and social responsibility.

4.5 Make safe connection between different construction processes

The key to ensure the safety of the project is to make a good connection between different construction processes. This is crucial, because only by ensuring the safety of every link can we effectively guarantee the smooth progress of the whole project. Therefore, the safety responsibilities and safety requirements among each process should be clarified to ensure that each link has clear safety guidance and operating specifications. In addition, it is also crucial to strengthen coordination and cooperation between processes, which helps to ensure smooth safe connection between processes and avoid safety accidents caused by poor communication or improper cooperation. At the same time, safety supervision and inspection during the construction process should be strengthened. Through regular and irregular inspections, potential safety hazards and problems should be found and corrected in time to ensure the safety of construction personnel and the smooth progress of the project. In practice, this may mean conducting detailed safety meetings to discuss potential risks and preventive measures before the process change-over. Project managers and safety officers need to work closely together to ensure all construction crews are aware of and adhere to safety protocols. In addition, special safety checkpoints can be set up to allow experienced safety inspectors to evaluate the upcoming process to ensure that all safety measures are in place [5].

5. Conclusion

To sum up, during the construction of hydropower architectural engineering, safety management issues have always been the focus of the industry. By adhering to the basic principles of safety management, accidents can be effectively pre-

vented and reduced, and personal safety and environmental protection can be guaranteed. Safety management issues during the construction of hydropower architectural engineering cannot be ignored. We must always adhere to the principle of safety first, constantly improve safety management systems and measures, improve safety management levels, and provide a strong guarantee for the sustainable development of hydropower architectural engineering.

References

- [1] Li Hua, Zhao Zhibing, Wang Ruoyu, Jiang Tingting. Research on the “horizontal to edge, vertical to bottom” working system of safety management of major hydropower project construction [J]. *Hydropower and New Energy*, 2022, 36 (01): 47-50+53.
- [2] Wang Junsong, Duan Bin, Wu Wanbo, Chen Linfeng, He Ruoyang, Dai Ziyong. Research on the construction scheme of intelligent safety management and control system for hydropower projects [J]. *Chinese Journal of Safety Science*, 2021, 31 (S1): 96-102.
- [3] Zhang Yunguang, Duan Chuan, Ao Minghua. Practice and application of safety production standardization in hydropower project construction [J]. *Yunnan Hydropower*, 2021, 37 (02): 136-137.
- [4] Meng Tianqi. Discussion on safety management issues in water conservancy project construction [J]. *Sichuan Building Materials*, 2022, 48 (01): 222-223.
- [5] Shang Keping. Problems and solutions of water conservancy project management [J]. *Science and Technology Vision*, 2021, (27): 187-188.