Hydropower Project Based on the Safety Evaluation Mechanism and Safety Management Measures for Water Conservancy

Xu Guohui, Deng Zhenwei, Xu Lina, Lin Yan, Jin Yu

Liaoning Province Dalian Lianda Safety Occupational Health Technology Service Center Co., Ltd., Dalian, Liaoning, China

Keywords: Water Resources and Hydropower, Safety Evaluation Mechanism, Safety Management

Abstract: with the Rapid Development of Society, the Construction of Water Conservancy and Hydropower Projects is Increasing and the Importance of Safe Construction is Becoming Increasingly Prominent, in Order to Ensure the Safety of the Engineering, Accurate Safety Evaluation is Required, and Specific Management Measures Can Be Given for Specific Problems. Based on the Concept and Significance of the Safety Evaluation of Water Conservancy and Hydropower Projects, So This Paper Analyzes on the Safety Hazards in the Construction Process, As Well As Its Corresponding Preventive Measures and Solutions to Achieve the Purpose of Killing Security Accidents in the Bud.

1. Connotation and Characteristics of Safety Evaluation Mechanism

1.1 Connotation of Safety Evaluation of Water Conservancy and Hydropower Projects

Safety evaluation is also called risk assessment, as the name implies, it means the prediction of risk. As early as the 20th century, scholars summarized the safety evaluation as the ultimate goal of safety, and the application of safe engineering principles and safe engineering, as the method identifies the hazards involved in management processes such as engineering and production, which assesses the probability of its possible hazards and consequences, and then provides recommendations that are safer, reliable and mores implementable, because safety evaluation can't be discussed on paper, but also needs to be combined with the practice of engineering, so that it can accurately guide the safety of the project, predict the potential dangers and budget the possible losses, and then carry out its targeted safety protection measures to ensure the overall process of the construction can be carried out in a safe and orderly manner.

1.2 Characteristics and Criteria for Safety Assessment of Water Conservancy and Hydropower Projects

The evaluation of water conservancy and hydropower is not the existence of false big air, which requires it to have the authenticity with the actual situation, that is, the data used for evaluation should be the most realistic data collected from the construction front line; the water conservancy and hydropower safety evaluation is not aimed at The project is partially unfolded, but is carried out for the entire construction of the entire project. This requires analysis of each construction process to ensure the comprehensiveness of the evaluation. Unlike safety management, safety evaluation is more focused on prediction, in order to effectively avoid The hazards and property losses caused by safety accidents bring the possibility to provide targeted solutions and prevention programs by predicting safety hazards; safety prediction is to quantify predictions, give specific indicators, and verify The model is compared with the theory to verify whether the theory is correct, that is, to further optimize policies and theories through feedback.

During construction, the safety assessment can only achieve its prevention objectives when applied with the relevant guidelines, and the safety assessment construction can only achieve its prevention objectives only if it complies with the relevant guidelines. Firstly, we must ensure that the evaluation process can not be smuggled and it must be made public in order to ensure that the evaluation experts can accurately make their own pre-judgment on the safety of the project, and

  DOI: 10.25236/apssh.2019.095

thus ensure the independence of the evaluation. Secondly, the selection of the evaluation experts needs to consider whether it has an interest in the project. In order to ensure the objectivity in the project evaluation process, in the end, during the evaluation process, it should be ensured that the data provided by the actual project is provided, and that the evaluation method is applied to the project, and the proportion of the weight of the evaluation index is adjusted in real time. To ensure that the evaluation results are true and reliable.

2. The Role of Safety Evaluation

Safety assessment is different from safety supervision. It is an important part of water conservancy construction. It mainly uses modeling and analysis methods to complete the overall safety assessment of water conservancy construction, predicting the possibility of danger, and the degree of damage that will occur. Given the specific method of protection, this makes the evaluation of the arrangement particularly significant. The safety evaluation can record the whole process of the project construction, so as to guide the decision-making of the project, the improvement of information technology drives the process of engineering information construction, and further optimizes the original theoretical model through big data. In addition to this, we can also feedback the loopholes in the past projects, so that they can be gradually improved, so that the entire project can be carried out smoothly. Safety evaluation can also effectively reduce resource waste, save money, improve capital utilization, and help improve project management. This is mainly because the prediction of safety hazards can effectively prevent safety problems and reduce the economy. loss.

3. Construction of Safety Evaluation Indicators for Water Conservancy and Hydropower Projects and Corresponding Safety Management Measures

The safety evaluation index is determined according to the actual situation of the project construction. At present, it is mainly divided into the following four parts. This paper will analyze it and propose corresponding management measures.

3.1 Personnel Risk and Management Measures

3.1.1 Personnel Risk

Human risk is the primary consideration in the construction process of water conservancy and hydropower. Through past construction experience, more than 80% of the safety accidents caused by human factors require a large number of constructors to work, and materials and tools need to be stored at the construction site. The manual operation is complicated, and the labor load of the laborer is large, which causes a safety hazard.

3.1.2 Personnel Risk Management Measures

First of all, the current safety production system for construction of water conservancy and hydropower projects in China is still not sound enough, which brings security risks, and the management system of enterprises is the basic guarantee for construction safety. Only high-level management can achieve better safety management. It can supervise the safety management of subcontracting companies, and the improvement of the safety production system will enhance the safety awareness of managers and employees. Therefore, it is necessary to establish and improve the enterprise management system.

Secondly, the water conservancy and hydropower project is mainly completed by the constructor, so the quality of the constructor determines the progress and safety level of the project. The constructor needs to have a good cultural literacy, as well as relevant work experience. In order to ensure the smooth construction of the project, safety education should be carried out. Only good cultural literacy can ensure that the constructor can comply with the specifications of the operation manual during the construction process, and the importance of safe production of the correct number of people. Due to the special nature of water conservancy and hydropower construction, the

work is more cumbersome and the environment is more complicated, which requires the builder to have the ability to distinguish dangers. In general, it is to improve the overall quality of the builders, and vigorously promote the importance of safe production, so that safety is deeply rooted in the hearts of the people.

Thirdly, the complexity of the construction process requires that the employees must be trained in operation, so that they have a deep understanding of the safe operation process, and should also conduct safety technical assessments such as welding and vehicle operation. Only qualified personnel can be employed.

Finally, it should be ensured that the protective equipment such as helmets used in accordance with national regulations ensure that they can truly protect the constructors. The entrance gate should be strictly guarded, and only the safety protection measures can be taken to enter the work site.

3.2 Equipment Risk and Management Measures

3.2.1 Equipment Risk

The construction process of water conservancy and hydropower projects is particularly complicated. In order to ensure smooth construction, machines with different functions are required to work together, and whether mechanical equipment can operate safely and whether it is operated correctly will affect the safety of construction.

3.2.2 Equipment Risk Management Measures

The significance of scaffolding is to improve work efficiency and protect the safety of the constructor, which requires it to be stable. The construction environment of water conservancy and hydropower is complex. It should ensure that the scaffolding does not have any deformation and tilting in the working environment. At the same time, sufficient storage and transportation space should be reserved. The construction should be as simple as possible and ensure the safety of use.

Water conservancy and hydropower construction uses a large number of mechanical equipment. In order to ensure the safety of the project, it is necessary to check whether the machinery and lifting equipment are intact, so as to avoid personal safety caused by equipment failure and other factors, to ensure the safety of the constructor and the smooth progress of the project. This requires strict requirements for all levels of units to take up their own responsibilities.

The construction site is also an accident-prone area. Its fire safety should be paid enough attention. It is necessary for all levels of units to conduct regular fire inspections, identify potential safety hazards in a timely manner, and provide corrective measures and review. Train the builders, replace the live items such as power lines in time, and ensure the practicability of the fire-fighting equipment and the smoothness of the fire-fighting passage.

3.3 Environmental Risks and Management Measures

3.3.1 Environmental Risks

The construction environment of water conservancy and hydropower is complicated, which makes the construction safety more difficult to guarantee, and the construction environment cannot be selected. Therefore, it is necessary to adopt corresponding means to avoid the safety hazards caused by the environment.

3.3.2 Environmental Risk Management Measures

The constructor's work mentality is easily affected by the environment. This requires optimizing the construction environment on the basis of the existing construction work environment, such as ensuring the orderly placement of materials on the construction site and ensuring sufficient lighting during the construction process. In the process of construction, it is inevitable that it comes from high altitude, hoisting equipment and artificial falling objects. This requires the use of a protective net to try to stop the accidental damage caused by the falling objects to the surrounding and below. The construction passage should ensure unimpeded flow and avoid accidents such as collapse. It is

necessary to evaluate the safety of the construction passage and take protective measures.

3.4 Project Risks and Management Measures

3.4.1 Project Risk

The project itself has certain risks, and its impact on construction safety is mainly reflected in its construction scale, geographical situation, local climate and local geographical conditions.

3.4.2 Project Risk Factors and Management Measures

When faced with the dangers brought by the large scale of the project, the construction should be tested in time, and the large project should be divided into several small projects, and the hidden dangers should be feedback in time to deal with them in a timely manner, thus reducing the negative impact from the large-scale construction.

Water conservancy and hydropower projects are dangerous due to the complicated geographical conditions. During the construction process, they often encounter thorny geology such as karst and faults. This requires a thorough understanding of the geology of the construction site and professional equipment response. Corresponding geological conditions. Water conservancy and hydropower are spread all over the country, so it is necessary to face different topography, not only the endless plains, but also the hills and plateaus. This requires in-depth study of the topography of the construction site, safety assessment work based on its characteristics and previous construction experience, and corresponding safety construction measures.

More than 70% of the project is carried out outdoors, and due to the influence of the engineering cycle, the constructor and the construction process must deal with various harsh climates such as high temperature and heavy rain. This is also an important factor to be considered for safety evaluation. The negative impacts should be accurately predicted during the construction period. The construction types should be selected according to the weather. For example, rainstorm weather can be used for material storage. High temperature weather can choose a quieter day to work, and high temperature rest.

4. Conclusion

The safety control of the whole process of water conservancy and hydropower construction can effectively reduce the occurrence of safety accidents, because the main purpose is to improve the safety of the construction equipment and process, and further discover and demonstrate the rationality of the pre-design plan during the construction process so as to achieve the purpose of reducing the danger. Safety assessments can be combined with the actual projects to improve on the existing technical standards and thus driving to the management standardization processes, which is the process of safety engineering evaluation that is also the process of archiving the project, providing a basis for future maintenance and application.

References

[1] Zheng Huiling. Strengthening the quality assessment of quality inspection of water conservancy and hydropower projects [J]. Agricultural Science and Technology and Information. 2019 (08).

[2] Feng Jinchao. Research on construction safety management and control of water conservancy and hydropower projects under the new situation [J]. Intelligent Building and Smart City. 2019 (07).

[3] Zhang Chao. Construction safety management and safety control of water conservancy and hydropower projects [J]. Jushe.2019 (01).

[4] Sang Jiansheng. Construction Management and Safety Control Measures for Water Conservancy and Hydropower Projects [J]. Urban Construction Theory Research (Electronic Edition). 2019 (03).

[5] Xie Shijun. Construction evaluation of water conservancy and hydropower projects based on green construction evaluation index system [J].Heilongjiang Water Conservancy Science and Technology.2018 (12).