



Research on Legal Responsibility and Risk Prevention Mechanism of Design Institutes in Engineering General Contracting Projects

Jiayue Zhao*

Northwest Engineering Design and Research Institute Co Xi'an, China 730099

*85334943@qq.com

Abstract. This article analyzes the legal risks faced by design institutes in EPC projects, such as incomplete contract terms, design quality issues, improper design change management, and intellectual property disputes. It proposes prevention and control strategies such as improving contract management mechanisms, strengthening design quality control, optimizing design change management processes, strengthening intellectual property protection and management, emphasizing the study of environmental laws and regulations, and developing legal emergency plans for each stage of the project. These measures aim to assist the design institute in effectively addressing legal risks, ensuring the smooth progress of the project and legal compliance.

Keywords: design institute; Engineering General Contracting (EPC); legal responsibility; Risk prevention and control

1 Introduction

In the field of construction engineering, engineering general contracting, as a model that integrates design, procurement, and construction, has been widely used to greatly improve the efficiency of project management. However, the inherent complexity of the EPC model cannot be ignored, which brings numerous legal responsibilities and risks to participants. These risks cover multiple areas such as contract execution, design changes, and maintenance of intellectual property rights. Once mishandled, they can easily trigger significant legal disputes. According to the Contract Law of the People's Republic of China and the Regulations on Quality Management of Construction Projects, all participants in the project must strictly comply with their legal responsibilities at all stages. In view of this, exploring and establishing efficient legal risk prevention and control strategies to ensure that projects are carried out in accordance with laws and regulations is particularly crucial in the EPC model.

2 Analysis of Legal Liability and Risk Issues of Design Institutes in EPC Projects

2.1 Legal Disputes Caused by Incomplete Contract Terms

The contract is an important legal document for the smooth progress of the engineering general contracting project, and it is also a clear provision of the rights and obligations of all parties. However, in the specific implementation process, the drafting of contract terms often contains omissions, which poses a potential legal dispute risk for the design institute during the project execution phase. If the contract content is not specified, it may result in unclear rights and responsibilities of all parties involved in the project implementation process, increasing the probability of disputes. If the contract terms do not fully consider factors such as design changes and unforeseeable difficulties, once these situations are encountered during project implementation, the design institute will have difficulty making effective responses and may face the risk of breach of contract.

2.2 Infringement Liability Caused by Design Quality Issues

The success or failure of an engineering project depends on the quality of the design, and any loopholes in the design process can lead to serious legal disputes. If there are flaws in the design, it may pose safety risks to the project and trigger significant infringement liability disputes. For example, structural errors in architectural design may lead to safety accidents after project delivery, and the design institute may have to bear huge compensation for infringement. Insufficient design may also prevent the project from achieving its intended use function, causing property damage to the owner. Design oversights may also lead to environmental responsibility issues. If the design does not meet environmental requirements and causes negative impacts on the environment, the design institute may be punished by environmental regulations as a result.

2.3 Default Risk Caused by Improper Design Change Management

Design changes are a common phenomenon in EPC projects, but if the design institute fails to handle these changes properly, it may face the risk of breach of contract. If the design changes are not updated to the contract content in a timely manner or do not obtain clear written approval from the owner, the design institute may be deemed to have unilaterally violated the contract, or if the design changes have not undergone strict technical evaluation, technical difficulties or cost increases may arise during the construction process, which may lead to legal disputes between the design institute and the construction party or supplier. Inappropriate design change management can also disrupt the overall project schedule, causing delays in the project and ultimately leading to claims from the owner.

2.4 Legal Risks Caused by Intellectual Property Disputes

Intellectual property is one of the important legal risks faced by design institutes in EPC projects, especially in projects with complex technology and innovative designs. Design institutes may face accusations of intellectual property infringement from third parties. If they include unauthorized patents, copyrights, or trademarks in their design work, they may be involved in infringement disputes, which may not only result in huge compensation, but also lead to project suspension or design plan adjustments. In the process of collaborating with property owners and other partners, the design institute faces the risk of unclear ownership of intellectual property rights, which may lead to legal disputes. For example, if the design institute and the owner fail to clarify in advance the use, modification, and transfer rights of the design results, it may lead to disputes after the completion of the project.

3 Research Strategies for Legal Responsibility and Risk Prevention of Design Institutes in EPC Projects

3.1 Improve the Contract Management Mechanism

The contract in EPC is a key document that defines the rights and responsibilities of all parties involved, and is an important guarantee for avoiding legal risks. The Contract Law of the People's Republic of China provides detailed regulations on the signing, execution, modification, and termination of contracts^[1]. In view of this, the design institute needs to strengthen the contract management system to ensure the rigor and practical operability of the contract content. In the contract signing process, it is necessary to thoroughly review all terms to ensure that the content is clear, error free, and in compliance with relevant laws and regulations, especially in core terms of responsibility allocation, design changes, and delayed construction. During the contract execution period, a dynamic regulatory system should be established to monitor and evaluate the progress of contract execution in a timely manner, in order to identify and resolve potential legal issues and prevent disputes from arising. As for the modification and termination stages of the contract, it is necessary to strictly follow the procedures stipulated in the contract to maintain the legality and effectiveness of the contract modification and avoid legal disputes.

3.2 Strengthen Design Quality Control

The success or failure of engineering projects is crucially dependent on design quality, which also plays a crucial role in determining the legal responsibilities that design institutes need to bear in EPC projects. Once there are defects in the design quality, it will not only trigger non performance of the contract, but may also lead to significant infringement disputes. It is necessary for the design institute to establish a sound design quality management system, which should cover various aspects such as scheme conception, construction drawing, design review, and evaluation. Each stage requires the establishment of precise quality standards and regulatory measures to ensure the

accuracy, reliability, and legality of design outputs. For example, in the design phase, strict adherence to national and industry technical standards and specifications should be followed to ensure the comprehensiveness and accuracy of design documents^[2]. The design institute also needs to attach importance to the review of the design and the introduction of a third-party review mechanism. The review process of the design is crucial for discovering and correcting deficiencies in the design. This process should be handled by senior professionals. Introducing a third-party review can not only provide professional technical support to the design institute, but also issue advance warnings of possible legal risks and avoid facing legal responsibilities in the later stage due to design omissions. Design institutes should increase their efforts in cultivating and managing design personnel. A high-quality design team is the foundation for improving design quality. Therefore, design institutes should regularly hold professional training to enhance the professional skills and legal concepts of design personnel, ensuring that design products meet technical standards while complying with laws and regulations.

3.3 Optimize the Design Change Management Process

The control of design changes must be carried out in accordance with rigorous review procedures. During the specific execution phase of the project, every design adjustment requires careful discussion and argumentation, as well as written consent from all stakeholders. The change request should provide a detailed explanation of the cause, content, impact, and corresponding cost adjustments of the change, to ensure that all parties involved have a comprehensive understanding of the content and possible outcomes of the change. This approach not only effectively manages project risks, but also provides legal support for the design institute to prevent contract disputes caused by changes. In the process of implementing design changes, the design institute needs to ensure the completeness and traceability of all change records, revise design documents and related materials in a timely manner, and maintain close communication with the construction team to ensure the smooth progress of changes and prevent project delays or quality problems caused by insufficient communication. The design institute should establish a standardized change management process and format, which can improve the efficiency and accuracy of change management and reduce the risks caused by human errors. Through standardized management, design institutes can not only reduce legal risks arising from design changes, but also enhance the overall effectiveness of project management.

3.4 Strengthen Intellectual Property Protection and Management

The protection of intellectual property rights of design institutes is very important in EPC projects. If the design results are not well protected, it will cause significant legal disputes. The Patent Law of the People's Republic of China and the Copyright Law of the People's Republic of China provide legal basis for the protection of intellectual property rights. Design institutes should have a sound intellectual property management system to ensure that design results are protected by law^[3]. The ownership, use

rights, and liability for infringement of intellectual property rights should be clearly defined in order to effectively prevent the abuse and infringement of intellectual property rights. In the design process, attention should be paid to internal protection of the design results, and dedicated intellectual property documents should be established to ensure the security and confidentiality of design materials. Regular intellectual property education should be conducted to enhance employees' understanding of intellectual property and effectively prevent intellectual property disputes.

3.5 Strengthen the Study of Environmental Laws and Regulations

The Environmental Protection Law of the People's Republic of China and other relevant laws and regulations have put forward clear requirements for the environmental responsibility of design institutes in EPC projects. The design institute must delve into environmental legal knowledge to ensure that the design scheme and project execution comply with the requirements of environmental regulations. It is necessary to systematically study and update environmental regulations, as these regulations have obvious time constraints and regional characteristics. The design institute should regularly hold training to keep the design team informed of the latest environmental laws and regulations. For example, a dedicated legal research group can be established to regularly review and analyze environmental regulations related to the project, and integrate them into the design work. The design institute should also incorporate the provisions of environmental regulations into the design specifications and processes. In the design process, the design institute should strictly follow environmental regulations to ensure that the design scheme meets environmental standards. For example, in the engineering site selection and process design stage, the design institute should comprehensively evaluate the project's impact on the environment and implement corresponding environmental protection measures to reduce damage to the natural ecology. The design institute should also actively establish communication and collaboration with government regulatory departments and environmental experts. During the project construction process, the design institute can invite environmental experts to provide technical support and maintain close contact with regulatory agencies to ensure that the design scheme and construction process comply with environmental regulations and prevent legal liability due to environmental issues.

3.6 Develop Legal Emergency Plans for Each Stage of the Project

Legal risks may arise at any time in EPC projects, and the design institute needs to plan ahead and build legal emergency plans for each critical period, so that they can respond promptly and handle legal disputes properly. The Emergency Response Law of the People's Republic of China provides a legal basis for dealing with sudden legal risks. The design institute should develop targeted legal emergency plans based on the progress of the project, including but not limited to breach response strategies during contract execution, resolution of infringement disputes caused by design flaws, and quick response measures for intellectual property disputes^[4]. These legal emergency plans should include risk identification, response strategies, allocation of responsible

personnel, and emergency resource allocation, and should be regularly practiced and revised to ensure their feasibility and efficiency in practical operation. By developing sound legal emergency plans, the design institute can quickly take action in the face of unexpected situations, mitigate the damage caused by risks, and ensure the smooth progress of the project.

4 Conclusion

Design institutes bear important legal responsibilities in engineering general contracting (EPC) projects and face complex risk environments. By improving contract management, strengthening intellectual property protection, and developing legal emergency plans, the design institute can effectively prevent and control legal risks, ensuring the smooth progress of the project. The design institute should continuously optimize the legal risk management mechanism and improve project management level to cope with the increasingly complex legal environment and market demand.

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