

Risk study of International Procurement Phase in EPC mode

Yingxia Luan¹, Xiaojun Sun¹, Xiuxue Wang², Jing Qiao¹

¹Qingdao City University, Shandong, Qingdao 266106

²SEPCOIII Electric Power Construction Co.,Ltd., Shandong, Qingdao 266035

ABSTRACT

In recent years, China's electric power engineering construction enterprises take advantage of the opportunity of the "Belt and Road" initiative, to undertake a large number of international engineering projects, and become an important force in foreign contracting projects. However, in the implementation of international projects, the international procurement link is faced with many complex and changeable risks due to the factors such as geography, time span and material demand. By analyzing the main characteristics of international procurement activities under EPC mode, this paper deeply analyzes the risks and countermeasures, in order to provide beneficial reference and reference for contracting enterprises.

KEYWORDS

EPC; international materials; procurement activities

1 Introduction

General contracting mode (EPC) refers to the contracting mode in which the general contractor is responsible for the whole process of the design, procurement and construction of the project and delivers the project with qualified use to the owner. EPC mode has shown a wide application prospect in construction projects, especially in power engineering construction. International procurement phase of this project is an important link of the project delivery, so the thorough study of the main risks, not only help to optimize the allocation of resources, improve procurement efficiency, effective cost control, also can ensure the smooth implementation of electric power engineering construction project, further promote the development of the internationalization of electric power industry in China.

2 Characteristics of international procurement activities in the EPC mode

Compared with ordinary procurement activities, international procurement itself is characterized by long distance, long time consuming and high risk due to the complex external environment, while the procurement activities under EPC mode are more distinctive:

2.1 Strong professionalism

Take the power engineering construction project as an example, the project scale under the EPC mode is huge, involving a wide variety of equipment and materials, and the quality standards are also very demanding. Therefore, in the process of international procurement, it is necessary to fully understand the project requirements, accurately grasp the technical specifications, performance requirements, standards and specifications of relevant materials, to ensure that the purchased materials can meet the project needs.

2.2 Procurement cycle is tight

EPC projects generally have strict construction period requirements. In order to complete the procurement task within the specified time, market research and supplier assessment need to be done in advance in the early stage of the project. In order to ensure the timely delivery of materials, a reasonable procurement plan and schedule should be formulated.

2.3 Procurement procedures are strict

In the EPC project, the owner has strict requirements on the procurement procedures including supplier selection, procurement contract signing, material inspection and acceptance, so as to ensure their own interests. Therefore, in the process of international procurement, the general contractor must establish a complete set of procurement management system and process in accordance with relevant laws and regulations and industry standards to ensure the legality and compliance of procurement activities.

3 International procurement risk analysis in EPC mode

3.1 Pre-stage risk

The general contractor must conduct in-depth research and understanding of the bidding documents or contract contents provided by the owner, so as to accurately estimate the project quantity, formulate a detailed procurement plan and arrange the procurement comprehensively before carrying out international procurement activities. This step is critical, because it will directly affect the smooth progress of the whole project, and will also directly affect whether it will ultimately be profitable.

3.1.1 Interpretation of the bidding documents

Under the EPC mode, the general contractor is often difficult to fully understand all the needs of the owner or deeply understand the specific requirements of the owner for the project when faced with the urgent bidding time. During the bidding period, the general contractor needs to complete a lot of work in a limited time, including understanding the bidding documents, estimating the quantities and formulating bidding strategies. The urgency of time makes it difficult for the general contractor to fully understand and digest the needs of the owners. Moreover, the bidding documents usually contain a large number of business details and professional technical terms, which require the general contractor to have deep professional knowledge and rich experience to correctly understand them. However, in practice, the purchasing personnel of the general contractor may be difficult to fully understand the needs of the owners due to the lack of sufficient professional knowledge or experience. In addition, the general contractor needs to communicate with the owner repeatedly when interpreting the tender document. However, due to the differences in language and culture, as well as the restrictions of communication channels, it may be difficult for both sides to establish an effective communication mechanism, which makes the expression of needs not accurate enough, the communication is not timely, or causes the misunderstanding of both sides.

Based on the above reasons, if the general contractor has a certain misunderstanding of the bidding documents, it may lead to underestimation of project quantity, underreporting or reporting errors. This will directly affect the calculation of material procurement costs, and is accompanied by a series of risks that may lead to project budget overruns and affect the economic benefits of the project. At the same time, the progress of the project may be blocked by the shortage or delay of material supply, which affects the overall progress and quality of the project.

3.1.2 Make the procurement plan

The formulation of procurement plan is an important part of the smooth progress of procurement activities, but in practice, risks are often caused by various factors. Specifically include: when determining the procurement method, Lack of understanding of market information or improper decision-making, May lead to the improper selection of the procurement method, Thus affecting the efficiency and cost of procurement; When arranging the procurement schedule, Failure to fully consider the construction progress and the changes in the materials required by the project, Lead to an unreasonable schedule, Affected by the timely delivery of equipment and materials; When making the transportation plan, Failure to take into account the transport cycle, force majeure and customs clearance, Causing delays in transport, The affected materials shall arrive at the construction site in time; besides, The procurement plan is not static in the actual implementation process, Procurement activities in the project often cannot be executed strictly according to the plan due to the impact of the actual operation of the construction site, Need to be adjusted according to the actual situation, This brings unpredictable risks to procurement activities.

3.2 Order risk

In the procurement and ordering process of EPC project, errors in supplier selection and contract conclusion constitute major risk points.

In power engineering construction projects, the owner will usually require the general contractor to select partners from their pre-approved equipment suppliers to complete the procurement activities. However, if the general contractor and these suppliers are the first cooperation, the two parties usually fail to provide the required materials or equipment on time, quality and quantity due to the lack of in-depth understanding. In the process of negotiation, suppliers may also hide their own problems, such as insufficient production capacity, lax quality control, etc., which will affect the order arrangement of the general contractor, and these problems are often gradually exposed in the subsequent procurement process.

At the same time, due to multiple factors such as short time, lack of experience or limited ability, differences may occur between the owner and the general contractor on the contract understanding, and the terms in the order contract are

not perfect, which may affect the conclusion of the purchase order contract and make the general contractor bear too much risk. These problems will also have an adverse chain reaction to the subsequent procurement activities, further leading to the increased cost of equipment and materials procurement, bringing the risk of site inventory shortage, thus affecting the progress and cost control of the whole project.

3.3 Delivery risk

The delivery link is directly related to the construction progress and the final quality of the project, and is the key in the performance process of the international procurement contract. In the process of material delivery, two aspects of risks are particularly prominent, one is the risk of the delivery link, the other is the risk of the inspection link.

During the delivery process, the general contractor should carefully plan the procurement activities, pay close attention to the production schedule of the supplier, and take effective measures to urge the delivery quickly once any delay is found. If the rush is not smooth, the site materials will come one after another, not only cause economic losses, but also may make the construction period have to be delayed repeatedly. On the other hand, the quality and performance of the materials are the cornerstone of a successful engineering project, and the importance of the inspection process is also self-evident. If the inspection is not strict, the corners will be mixed into the site, the loss will far exceed the inspection costs, seriously threatening the overall quality of the project.

4 Suggest countermeasures

4.1 Prepare a reasonable procurement plan

In the bidding stage, the general contractor can send senior professionals with their profound industry experience and rich professional knowledge to conduct a comprehensive and in-depth review of the bidding documents, and completely and accurately understand the bidding documents, so as to lay a solid foundation for the smooth development of the subsequent work. When calculating the amount of work, in order to effectively reduce the potential trouble and additional costs in the actual construction, these professionals need to maintain a high degree of concentration and vigilance, and try to avoid possible omissions and errors, so as to ensure the accuracy of the amount of work.

The General Contractor shall make clarification requirements to the bidder in time to obtain clear guidance and explanation and reduce the errors in the preparation of the procurement plan. In addition, the general contractor can refer to the project quantity data and related indicators of similar projects to make a preliminary evaluation of the project, which can significantly reduce the estimation error of the bill of quantities, and improve the accuracy and reliability of the bidding scheme, so as to create more advantages for winning the bidding project.

4.2 Reduce the procurement contract conclusion error

In order to minimize the possible risk of error when signing the procurement contract, the general contractor needs to conduct an in-depth investigation and detailed evaluation of the suppliers in the bidding stage. Through the extensive collection and analysis of supplier credit records, production capacity, economic costs, time efficiency, and other key factors, the general contractor is able to comprehensively measure and select the most appropriate supplier, while establishing alternatives to address the surprises.

When the owner demands for the use of the designated supplier, the general contractor should actively communicate with him and strive to get the understanding and support of the owner, so as to moderately relax the restrictions on the supplier selection and increase the flexibility. For materials that can only be purchased from a single source, the general contractor needs to discuss the optimized design scheme with designers as soon as possible, so as to effectively spread risks while reducing excessive reliance on specific suppliers. Through these forward-looking preparations and strategic adjustments, the general contractor can effectively prevent the mistakes in the process of signing the procurement contract, and ensure the smooth progress and successful implementation of the whole project.

4.3 Guarantee the delivery quality

In the EPC mode, the general contractor must maintain a high degree of vigilance and flexibility when performing the international procurement tasks. Especially in the management of delivery, the general contractor should not only pay close attention to the production dynamics of the supplier, but also closely track the actual demand of on-site materials, so as to ensure that the purchased materials can be delivered to the construction site on time, quality and quantity, so as to be returned. Therefore, the general contractor should flexibly adjust the delivery strategy according to the specific situation to avoid the delivery management due to improper methods, which will affect the progress and quality of the

whole project.

In the delivery inspection link, the general contractor should formulate a careful and meticulous quality inspection plan. In the process of testing, it is necessary to carry out a comprehensive and profound assessment of the testing process and work rigor, so as to effectively reduce the risk caused by process defects and work errors. When the total contractor personnel nervous or inspection ability is insufficient, can also according to the equipment material properties and construction schedule, reasonable choose third party professional testing institutions, in order to improve the professional and efficiency of inspection work, for the project smoothly provide strong guarantee, also can make the procurement overall management level can be further improved.

4.4 Ensure the smooth development of all links of logistics

4.4.1 Transportation link

On the eve of the launch of the material transportation activities, the general contractor needs to conduct a comprehensive and detailed inspection of the packaging status of the materials, and also conduct a rigorous assessment of the external environment factors on the transportation route. In addition, the general contractor needs to reassess the current external environment before the materials and carefully decide whether to adjust the established transportation plan to ensure that the delivery time is consistent with the actual construction schedule.

4.4.2 Storage link

The field material management team needs to show a high degree of foresight and organizational ability in the face of large-scale material concentration arrival. Material management personnel need to carefully plan, preset sufficient storage area, layout in advance, and ensure the reasonable allocation of storage site and human resources, so as to cope with the heavy pressure of receiving work and ensure the unimpeded receiving process. In order to ensure the smooth and smooth completion of the material warehousing, the general contractor also needs to strengthen the packaging inspection link, inspect the packaging before the material shipment, and identify and solve the potential packaging defects, so as to reduce the complexity and difficulty of the warehousing operation.

In addition, the general contractor needs to build a comprehensive and effective storage system, so as to maximize the intact quality and performance of the storage materials in the whole storage period. Through the monitoring of the internal and external environment, classified management of inventory and materials, and timely response measures taken when necessary, the general contractor can timely make effective inventory and management of the inventory of the warehouse, so as to maximize the safety of the warehouse. The construction and implementation of this management system is not only conducive to improving the efficiency and quality of inventory management, but also can provide a solid material guarantee for the smooth delivery of the project.

References

- [1] Chen Ying. Brief Discussion on Key Points of Full-process Engineering Consulting Services at Present Stage and Confusions under New Construction Models: A Case Study of Full-process Engineering Consulting for a University Construction Project [J]. Construction Supervision, 2020(10): 57-59.
- [2] Han Jin Shi, Xu Shan, Liu Qi, et al. General contracting study of EPC project based on financial perspective [J / OL]. Friends of the Accounting, 2023 (S1): 110-113.
- [3] Li Ping. International EPC engineering project material procurement risk assessment study [D]. Shandong Jianzhu University, 2019.