

Reflections on the Review of Change Claims for Offshore Wind Farm from the Perspective of Project cost management

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Abstract: *With the development of China's new energy industry, the construction scale of offshore wind farm projects is constantly expanding, and the ensuing change claims often occur. Reviewing the change claim items is an important responsibility of the project cost management agency, and it is an important link to protect the legitimate rights and interests of both the contractor and the owner. Based on the research results of existing scholars, this paper analyzed the causes of change claims for offshore wind farm projects, and analyzed a change claim project declared by the contractor and the review proposal of the project cost management agency based on the actual project.*

Keywords: *offshore wind farm; change claim; review; project cost*

1. Background overview

The frequency of engineering change claims has risen with the advancement of China's offshore wind farm construction. Claims work, as a management behavior for both the contractor and the owner to protect their own economic interests, has an increasingly necessary and prominent role and significance. However, the development time of offshore wind farm construction in China is short, the construction experience is insufficient, and the relevant contract management experience and legal awareness are relatively weak. In order to avoid unfair behavior in the construction process affecting the cost and progress of the project, and harming the interests of all participants, the review of the change claim work by the project cost management agency should be raised to the level of daily operation.

2. Features of Offshore Wind Farm Project

2.1 Expensive

2.1.1 Higher up-front work costs

Offshore wind farm projects take a long time to prepare for the early stage, and many units and departments need to be coordinated, mainly including marine and maritime affairs, etc., and many supporting documents need to be obtained, mainly including sea areas, navigation, and marine environmental impact assessments. Compared with onshore wind farm projects, offshore wind farm projects have higher pre-work costs.

2.1.2 High proportion of ship and machinery costs in construction

According to the analysis of the cost of offshore wind farm projects constructed in coastal areas of China, generally speaking, the cost per kW of offshore wind farm projects is much higher than that of onshore wind farm projects.

Construction and installation costs account for about 35% of the total cost. Currently, the number of completed offshore wind farm projects is relatively small, the construction team is relatively single, and the experience is not yet sufficient. In addition, the offshore construction conditions are complex and affected by various factors such as tides and weather. Due to these factors, the required key large-scale professional ship and machinery equipments are scarce and expensive.

It is just because the professional teams with construction qualifications and capabilities are

concentrated, unlike the traditional bidding process for some construction projects, where contractors may use low prices to win bids, offshore wind farm construction bidding is a typical market dominated by contractors. The owners are forced to choose only a few units that dominate the market price. The price is relatively opaque and difficult to be accurately measured by the others.

In the cost composition, the cost of ship and machinery accounts for a relatively high proportion. According to the analysis of the quotation results in the bidding process, using self-owned ships or leased ships by the contractors may be one of the reasons for the difference in cost, resulting in a large difference in quotations. In addition, unlike onshore wind farm construction, calculating the costs of large-scale ship and machinery in the working and parking status is also quite different during offshore wind farm construction. At present, how to scientifically calculate it is a problem to be further studied.

In addition, offshore wind farm projects require professional docks with higher rental costs. The harsh offshore construction environment and the short construction window period are also a factor that causes the cost to be expensive.

2.2 Construction is difficult

The single-unit capacity of offshore wind turbines continues to increase, showing a trend of "large MW". At the same time, there is a greater possibility of typhoons passing by in the sea area, so the requirements for the foundation of wind turbines have increased. Because the topography is below sea level, it is impossible to directly observe the topography, lithology, structural structure and other geological features of the wind farm area. The geological survey is difficult. In some sea areas represented by Xinghua Bay in Fujian Province, there is still the problem that the shallow covering layer in the wind farm area is generally shallow. Under these conditions, the design requirements and construction difficulty of the wind turbines' foundation have increased, the construction period and cost have increased significantly, and there is a risk of encountering boulders in the pile driving process.

2.3 Vulnerable to policy

In February 2020, the policy stipulated that new offshore wind farm will no longer be included in the scope of central financial subsidies. For offshore wind farm projects approved before the end of 2018, only when all units are connected to the grid before the end of 2021 can the electricity price at the time of approval be obtained. The process of subsidy decline has accelerated.

With the promotion of the subsidy policy, the "rush-to-install" behavior of offshore wind farm project is happening. In order to complete the grid-connected power generation as soon as possible, offshore wind farm projects often start construction without full approval documents, and handle the rest of the approval documents during the construction process. Compensation for land use, sea expropriation, and fishery will be delayed due to the delay in the processing of documents, and there will be incidents such as fishermen blocking work during construction.

In addition, the cost of sea area use, aquaculture compensation and resource protection and restoration is showing an increasing trend.

3. Analysis on the Causes of Change Claims for Offshore Wind Farm Projects

Changes refer to the correction of errors, omissions, additions or deletions in the design drawings, and changes to optimize the design and facilitate construction. Claims refer to the right of the contractor to seek compensation for losses due to project delays and increased costs due to non-self-caused reasons during the implementation of the contract.

Any engineering change claim declared by the contractor must meet the principles of objective truth, reasonableness and lawfulness. Engineering change claims are classified according to their content and can be divided into three categories: expense claims, construction period claims, and simultaneous expense and construction period claims. According to the content of the contract, it can be divided into two categories: claims within the contract and claims outside the contract.

Most offshore wind farm engineering construction projects have the characteristics of large scale, long construction period, relatively harsh environment, wide range of organization, coordination and dispatch, and strong policy uncertainty. In the bidding stage, there will inevitably be some imperfections in the relevant materials, design drawings, and construction plans. In this case, the

contractor is very likely to change according to the field conditions or the new design scheme during the construction stage. In addition, some accidental events or irresistible factors such as extreme weather, fishermen blocking work, military exercises, etc., will also bring engineering changes. Summarize according to possible situations, mainly including contract change factors, contractor's breach of contract factors, unforeseen factors, policy changes and other factors.

3.1 Unforeseen factors

(1)Force majeure factors: The marine environment is relatively harsh, and the meteorological conditions are complex and changeable. Various extreme weather and natural disasters that are not suitable for construction operations are force majeure factors, and also include force majeure factors caused by human activities such as wars, worker strikes and fishermen blocking work.

(2)Geological survey data does not match the plan: There are differences between the geological conditions described in the contract documents and the actual conditions of the construction site, or the geological survey data in the bidding documents cannot meet the requirements during the actual construction stage.

3.2 Contractor's breach of contract factors

The manifestations of the contractor's breach of contract are mainly reflected in the sea area expropriation, the handling of warrants, and the payment of goods. In the event of overdue submission of design change materials, it is also attributed to the developer's breach of contract. In addition, in the event of necessary shutdowns and losses during the construction of offshore wind farm, or if there is a large deviation from the plan, the contractor may also file a change claim with the owner.

3.3 Contract change factors

According to changes in construction conditions and external conditions, the owner may make minor adjustments to the project to make the project better. Such changes are common during construction, especially for large projects. However, such changes are often accompanied by an increase in the amount of construction works, an increase in the difficulty of construction, and loss of contractors' interests. The following are some of the more common contract changes:

(1)Design changes: Adjust and redesign some parts of the project during the construction stage, which will bring about changes in the construction plan of the construction company and changes in the construction method and schedule;

(2)Improvement of standards: At the request of the owner or due to the special circumstances of the project construction, the quality standards of the project need to be improved, which brings the improvement of construction difficulty for the contractor;

(3)Changes in engineering quantity: in the construction stage, according to the needs of the owner or others, increase the engineering quantity.

3.4 Policy changes and other factors

At the current stage, the development of the new energy industry has a strong correlation with relevant national policies. Changes in national policies and regulations are mandatory. The promulgation of certain new policies or the revision of policies often affect the construction progress of the project to a large extent. The most common is the "rush-to-install" behavior brought about by the electricity price subsidy policy, which will promote the construction speed during construction. In addition, changes in tax policy for certain materials or construction are also a common factor.

Offshore wind farm engineering projects are complex and large in scale, and the probability and frequency of change claims are relatively high, and some causes not mentioned in the above-mentioned change claim factors will also occur, which are temporarily referred to as other factors.

4. Example—Take a offshore wind farm project constructed in Fujian Province as an example

4.1 Project Overview

An offshore wind farm project is located in Fujian Province. According to the bidding situation, 12 wind turbines with a single capacity of more than 5MW are designed and installed, with a total capacity of 66.4MW; in the actual construction process of the project, 2 machines were added, that is, 14 wind turbines were arranged, with a total capacity of 77.4MW. In November 2016, the owner and the contractor signed a construction contract, which mainly includes 5 foundations for high-pile cap wind turbines, 5 foundations for jacket wind turbines, 2 foundations for monopile wind turbines, and a total of 12 foundations for the construction of wind turbines. Including the transportation and installation of wind turbines and the laying of submarine cables.

With the progress of the project construction, the owner, the contractor and the supervisor have reached consensus and decided to make some adjustments to the plan: One is to increase the 12 wind turbines to 14 wind turbines; the other is to change two 5MW wind turbines out of the original 12 wind turbines to 5.5MW wind turbines, and the total installed capacity of the project is increased from 77.4MW to 78.4MW; the third is for unified construction technology, reduce construction interference factors, improve construction efficiency, 14 wind turbines foundations are unified as high pile cap foundations.

During the performance of the contract, due to factors such as changes in the construction plan, sea area management requirements, etc., the contractor's construction costs increased, and a total of 20 claims for changes were declared.

4.2 An example of contract changes

The amount of engineering changes, and the length of the steel pipe pile changes.

The length of the main steel pipe pile in the bidding stage of the project is 47m, and the weight of a single steel pipe pile is about 159.7t. In the actual construction process, there are a total of 24 main steel pipe piles for the wind turbines foundation with 6 positions, and the length becomes 53-60m. The original leased crane vessel can hoist 52m main steel pipe piles. The length of 24 main steel pipe piles with a length of more than 52m exceeded the lifting height requirements of the crane vessel. The contractor re-leased a 1200t-class crane vessel to meet the construction requirements of the main steel pipe piles on site, and submitted a change report on the improvement of the performance of the input equipment due to the lengthening of the main steel pipe piles according to the relevant contract terms.

According to the resource allocation and construction plan of steel pipe piles in the "Construction Organization Design" in the bidding documents: the main machinery and equipment to be put into this project include 400t azimuth crane vessel, 1000t crane vessel, anchor boat, transportation vessel and other construction machinery and equipment.

According to the "Special Construction Plan for Steel Pipe Pile Driving of High Pile Cap Foundation", only 300t azimuth crane and 700t crane are considered in the mechanical configuration plan, the 1200t crane is not planned.

According to the relevant clauses of the contract: "change the elevation, baseline, position and size of the relevant parts of the project", the change in the length of the steel pipe pile belongs to the design change. Checking the engineering quantity list, the measurement method of steel pipe pile is "t" instead of "m", changes due to pile length can be reflected as changes in engineering quantities.

To sum up, according to the parameters of the marine machinery equipment, the equipment planned to be invested in the bidding stage can meet the lifting requirements of the steel pipe pile after the design change. At the same time, according to the terms of the contract, "The contractor's proposed replacement of equipment during construction must be approved by the owner's engineer and the supervisor's engineer. In the event of modification or replacement without consent, the contractor shall bear the costs incurred." The Contractor's replacement of marine machinery equipment is at his own discretion. It is suggested that no compensation should be made for this change of marine equipment

5. Suggestions on change claims from the perspective of project cost management

5.1 Increase the awareness of change claims

The claim is a compensation proposed by the contractor based on its own loss. Claim is a neutral term and does not imply punishment. Claim is a legitimate and legal right based on law and contract. Both the contractor and the owner should treat the claim events reasonably, strengthen the awareness of engineering change claims and pay attention to them, and establish a scientific and perfect engineering change claim management mechanism. Based on the engineering change claims under the contract, it is necessary for the project cost management agency to have a detailed knowledge and understanding of the contract terms and conditions, and carefully search, compare and analyze whether the change claims made by the contractor are well-founded. And it is necessary for the project cost management agency to analyze the reasons for the claim in a targeted manner for the claim item, and adopt different review methods.

5.2 Establish a change claim material collection specification

In view of the fact that the occurrence of change events is often beyond the estimated risks, if the construction logs, correspondence and other materials that can prove the engineering changes and engineering quantities are not complete or logically lacking, it will lead to an embarrassing situation that the engineering changes cannot be proved, and the rights and interests of the contractor will be affected.

Establish a list, specification and template of change claim declaration materials to form a guide for change claim. Avoid blindness in the collection and arrangement of materials, and try to unify and standardize the change claim declaration materials that need to be submitted and the important evidentiary materials that need to be reviewed.

Consideration shall be made from the perspective of analysis of the construction process itself, analysis of the sufficiency of factual basis, analysis of responsibility for changes in the construction process, principle of cost composition and calculation. Complete and logically rigorous proof materials can protect the vital interests of the contractor and reduce the workload of reviewers, and effectively save labor costs and time costs.

5.3 Develop a comprehensive review plan

There must be a clear documented basis for a successful change claim. To find out the details of the changes in the construction process through the detailed track record of the project. Materials that need to be consulted and checked include written change instructions, design change notices, correspondence, on-site work visas, construction logs, supervision logs, on-site photos and audio-visual materials, tickets and other evidentiary materials.

6. Conclusion

Offshore wind farm engineering change claims have a direct impact on the project cost. Reviewing the change claim items is an important work content of the project cost management agency. Analyzing and summarizing the causes of change claim items has important guiding significance for the development of project cost management.

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