OPTIMIZATION STRATEGY OF INTERNATIONAL ENGINEERING, PROCUREMENT AND CONSTRUCTION ENTERPRISE-POWER PLANT PROJECT

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With the deep technological changes and shifts in global business models, markets and strategy, the role of engineering procurement and construction (EPC) is experiencing a dramatic transfer motion requiring new tools, processes and strategies to be successful. The tasks of the paper include the analysis of the human resources structure, costs structure, and project schedule structure. As the result the suggestions on how to optimize the enterprise organizational structure, human resources policy, schedule on time completion and costs control will be provided. The suggestions can help EPC enterprises to explore a set of practical methods and models suitable for international power plant project management. It can save project costs, improve their economic benefits, and enhance the company's international engineering core competitiveness in the project market.

Keywords: project cost; human resources; project schedule; engineering project; procurement project; construction project.

This paper uses overseas power station projects as a case to conduct in-depth research and discussion on project cost management, in order to provide the reference to the related research [1]. Facing the international situation and the status quo of Chinese enterprises, it is necessary to answer the question of how to improve the cost management under the EPC engineering mode to improve the competitiveness of Chinese enterprises in overseas markets. It is the great practical significance to study the work experience of EPC general contracting enterprises and to use the project management ideas to sort out and improve the current EPC project management ideas [4].

As competition in overseas markets is more intense, cost management is more difficult. There are more influencing factors in the process of project implementation. The manpower, schedule, and cost control level of the project are critical to the success or failure of the project [6].

Halfaya power station project is 3×30MW gas-fired power station of China national petroleum corporation in Halfaya (Iraq). In this context, this paper takes the Halfaya power station project as an example to deeply study the mode of manpower and schedule cost management of the project, combined with the analysis of project data, find out the gains and losses in project cost management, and propose the direction of optimization, and the strategies to improve the management level of international EPC power station projects.

In order to ensure the smooth progress of project execution, China national petroleum corporation shall do its best to control its project team members, maintain the satisfactory quality and consistency of the member engagement [2].

At the later stage of work breakdown structure completion, the critical path network can be started. The network development as an extension of the critical path network done during the biding stage of the project will begin with decisions regarding relationships (interdependencies) between the work breakdown structure elements [5]. Then, the network will be drawn showing these relationships. The third step will be the assignment of durations to the tasks in the critical path network. After the durations are added to the network, the critical path will be calculated.

The paper proposes optimized countermeasures from the three important stages of EPC general contracting projects, namely, the design phase, the procurement phase, and the construction phase [3].

In terms of project design, the original total man-months were 252, and the optimized total man-months were 249. The total efficiency increased by 3 man-months.

In terms of project procurement management, the original total man-months were 153, and the optimized total man-months were 142. The total efficiency increased by 11 man-months.

In terms of project construction, the original total man-months were 3311, and the optimized total man-months were 3041. The total efficiency increased by 270 man-months.

For the project EPC manpower, the original total man-month is 3986, and the optimized total man-month is 3699. The total efficiency has increased by 287 man-months.

The key path of the project is: design work (long-term equipment design document release) procurement work (long-term equipment procurement) construction work. The total period of the project is 100+480+50=630 days.

The total period of the optimized project is 540 days.

After the adopting of the optimization strategy, the project construction period optimization efficiency is 90 days

Assuming that the labor unit price is 5000$ per month, the specific quantitative effect. Under the condition that the labor unit price is 5000$ per month, the specific cost optimization benefits are as follows.

Considering the efficiency of the construction period, as the total construction period of the project is saved by 3 months, and the management staff is 15 per month, 450 man-months are saved.

The cost saved by project management is 5000*3 + 450*5000 = 15000 + 2250000 = 2265000 $.

The cost saved by the design is 5000*3 = 15000 $.

The cost saved by purchasing is 5000*11 = 55000 $.

The cost saved by construction is 5000*270 = 1350000 $.

The total cost saved by the EPC project is 2265000 + 15000 + 55000 + 1350000 = 3685000 $.

The EPC project general contracting mode has become the mainstream mode of the international project contracting market. The suggested EPC model is not a simple addition of design, procurement and construction. This model has rich connotations and needs the support of corresponding management systems. The EPC enterprise must have an internal and external environment that adapts to its development, a clear strategy, a flat and efficient organizational structure, rich and complete business functions, efficient project management capabilities and advanced project management methods.

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