

Cost Management of Earned Value Method

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Abstract: This paper first introduces the earned value method theory, through the intermediate variable attribute of the earned value method, solves the problem of the lack of attention to workload in traditional cost management. Then, in order to further improve the effect of cost control, based on combing the research status of earned value method and cost management and related theories, this paper demonstrates and improves the effectiveness and operability of this method in practical work, and puts forward corrective measures combined with dynamic cost management. This paper intends to carry out the research on cost management of the shipbuilding industry, explore the introduction of earned value method, effective new cost management scheme, reduce controllable costs, realize profit maximization, further enhance the profitability of the shipbuilding industry, improve the market competitiveness of our country.

1. Introduction

In the new era of industrialization, the importance of oil for global industry is self-evident. The long-distance crude oil transportation through the Suez Canal puts forward new requirements for ships, and the long-distance oil tankers also emerge as the times require. Every year, a large number of oil tankers travel on the sea, followed by a large number of oil tanker orders. However, the construction cost of oil tanker is high and the starting price is high; The construction time of each tanker may be more than 18 months; The construction process is complex, so it must be built in dry dock before testing in water. Most of the hull components need to be welded together on land. This also presents a new challenge for the cost management in the construction process. Managers must be committed to collecting and considering various details in the process in the long-term and complicated operation process, and obtain the cost data, and timely revise and improve according to it. If China wants to gain a firm foothold in the global shipping market, it is of great practical significance to study the cost management system of earned value method for improving the management ability and cost-effectiveness of Chinese enterprises.

2. Earned Value Method

The earned value method is to determine the target budget in the planning stage, and collect the actual corresponding budget data in the later implementation stage to obtain the relevant measurement and calculation results. Based on the comparison with the planned budget, it determines the project cost and schedule deviation, further grasps the actual cost of the project, and determines whether the schedule performance meets the expectation. It can be seen that the key of earned value method is deviation analysis, and the practical application of deviation analysis in management is closely related to WBS (work breakdown structure).

The three basic parameters of earned value method are: Budgeted cost for work scheduled (BCWS), Budgeted Cost for Work Performed(BCWP) and Actual Cost for Work Performed(ACWP). BCWS refers to the estimated total cost of the project under the budget period, which mainly reflects the total investment in the whole process of the project measured by monetary value before construction. BCWP, that is, earned value, reflects how much budget cost is used in the actual construction progress of the project in a certain period of time. This index can reflect the basic situation of the project at the present stage, so that managers can understand the

implementation of the project, judge whether it is carried out according to the plan, intuitively reflect the completion information of the project schedule, and give the relative value of the budget cost. Through ACWP analysis to describe the situation of the project in each stage, the real production and monetary amount are determined, which are the absolute value of the cost generated under the real progress of the project.

Secondly, through the basic calculation of the above three cardinal numbers, we can get four evaluation indexes of earned value method: Schedule Variance(SV), Cost Variance (CV), Schedule Performed Index(SPI) and Cost Performed Index (CPI).

3. Cost Management Theory

With the development of the times, the purpose of cost management has changed. At first, it was only for accounting the cost of the project, and then for controlling the cost of overspending. Until now, cost management has begun to represent the value-added of enterprise value. Complex project is an enterprise business with complex process and high management difficulty. The fundamental significance of dynamic cost management system is to help enterprises turn to refined management for complex projects and take the lead in the core competitive market. The actual management of dynamic cost can be roughly divided into three steps: the first is to calculate the budget plan before construction, unify the relevant standards, draw up the schedule, and determine the target cost budget of the project according to the draft project contract; The second is the process management of the construction start-up stage. Early warning points are set in the process and feedback is made through regular monitoring. Due to the long design time of complex projects, the second stage is generally implemented simultaneously with the first stage, so they are also important links of complex project cost; The third is the stage of completion assessment, which is the stage of assessment and evaluation after the completion of the project and each sub project, combined with the responsibility center confirmed in the contract management and the cost accounting analysis results. Three modules are generated: cost budget, cost accounting and analysis, and cost assessment. Meanwhile, the whole process is supported by contract management, information platform, earned value and other means to promote the smooth operation of the dynamic project cost management system and realize the updating and upgrading of the company's management system.

3.1 Budget Planning Stage

Due to the complexity of the main body of the oil tanker project, the actual value of the project can not be the same as the paper. However, most shipbuilding projects require the completion of necessary cost accounting and work formulation within a short time before the start of construction, which requires enterprises to approach the actual cost as much as possible, so that the project cost can not exceed the original expected range. Therefore, before the specific budget plan, it is necessary to establish a set of unified project cost standards according to the historical plan and project contract, so as to lay the foundation for the accounting and management of each subsequent project.

3.2 Construction Process Stage

Although the dynamic cost is divided into two parts: occurred and to be occurred, the change of the first part which is basically determined is often very small. Therefore, the focus of management is on the part to be occurred, which puts forward the demand of all-round control for enterprises. In the construction process stage, the common means is early warning feedback, And the cost tracking mechanism established around the core purpose of early warning and feedback. The cost tracking mechanism is mainly divided into the following steps:

(1) Establish cost tracking books. The account book is equivalent to the carrier of cost tracking data. Its establishment is conducive to the efficient summary of data collection. Therefore, it should not stay at the high level, but should be distributed layer by layer, so that the bottom management can also use it. The cost tracking account book basically includes the name of the responsible object

(the smallest part of the subproject), process code, including labor cost, material cost, machinery cost, estimated construction period, actual construction period and other data. The enterprise can add and modify on this basis according to the characteristics of its main business.

(2) Establish monitoring points. Monitoring point refers to the time node of regular, comprehensive monitoring of the project, data collection and data feedback. The monitoring points should be set up according to the characteristics of the ship project, based on the previous plan, and the construction period should be divided into several stages. Generally speaking, the shorter the interval between monitoring points, the higher the monitoring frequency, the more accurate the data, and the stronger the effect of cost management, but it will also greatly increase the monitoring cost, which requires enterprises to make monitoring points according to their own reality. At the same time, for some key projects or links, it is unreasonable to monitor the dynamic cost in stages. At this time, you can choose to monitor the whole process, and record the input of human, machine and material continuously.

(3) Collect data. With the specific progress of the project, the professional personnel in charge of the project supervision should be prepared to collect the cost and progress data of the construction project according to the requirements of the monitoring points or the whole process tracking, ensure the accuracy and integrity of the data, log them into the cost tracking account book through physical or information means, and timely feed back to the superior management. After receiving the feedback data, the management will sort out and summarize it, use the earned value method for corresponding analysis, and immediately find out the possible problems in the data. Finally, according to the problems exposed, put forward the corresponding immediately feasible corrective measures, and feedback to the actual construction organization, urge them to correct immediately, to avoid the continuous occurrence of errors.

3.3 Completion Assessment Stage

Project cost management, although not the most important, but also essential is the last step, the assessment after the completion of the project. Completion assessment refers to the evaluation of project teams and individuals in terms of their performance in project construction and project management. Completion assessment is based on the accumulated records and final results of the project process. In essence, it ultimately determines the rewards and punishments that each participant of the project should bear, and then provides a virtuous circle for the company's continuous construction and correction in the future, In terms of talent promotion.

4. Conclusion

For shipbuilding enterprises, the implementation of project cost control based on earned value method is a realistic demand. Enterprises should continue to explore in practice, constantly summarize in the exploration, find the project cost control mechanism suitable for their own enterprises, and improve the earned value method management system, so as to strengthen the cost control ability, improve the enterprise earnings level, and promote the healthy development of enterprises. Based on the application of the critical path earned value method, this paper makes an in-depth study on the dynamic cost management system constructed by the earned value method theory. The main conclusions are as follows: the dynamic cost control system based on the critical path earned value method is established. Critical path earned value method distinguishes critical path and non critical path, which is more conducive for managers to clearly and quickly understand the operation status of the project, and to implement corrective measures when problems occur in cost or schedule control.

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