

Research on Performance Management System of Electric Power Enterprise Based on BSC

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Abstract—With the deepening of China's power market reform, the electric power enterprise are facing increasingly fierce external competition. This paper wants to find a way to improve enterprise internal performance management systems, performance assessment and enhance competitiveness. Based on the overview of domestic electric power enterprise, this paper introduces the theory of BSC and its advantages, and proposes a research on the performance management system of electric power enterprise based on BSC. The electric power enterprise BSC has design innovation, starting from the four aspects of finance, customer, internal operation and learning & growth. Finally constructs the performance management of electric power enterprise with BSC as the core. This system has strong operational and practical value.

Keywords—*The electric power enterprise; BSC; Performance management system; Performance appraisal*

I. INTRODUCTION

Since 2002, China has implemented the power system reform. Nowadays, with the rapid development of the power industry, the regional power market bidding trial operation. The direct customer power supply trial operation and other policies have been implemented. The government further promotes the reform of electric power system and introduces competition mechanism. It is important to further promote the formation of a reasonable power market mechanism.

At present, the competitive environment, organizational structure, management model, and customer needs of Chinese electric power enterprise are undergoing profound changes. The original performance management system has clearly fallen behind the times. The original performance management system of electric power enterprise is essentially a negative incentive management mode based on deduction method. The assessment content is simple and extensive, does not consider the difference in performance between employees as knowledge carriers. Finally it leads to the average on the distribution system. Doctrine cannot fully mobilize the enthusiasm and creativity of employees, which obviously cannot meet the competition needs of electric power enterprise to participate in the markets. With the gradual improvement of China's market-oriented economic system and the deepening of the market-oriented operation of electric power enterprise, it has become inevitable to establish a strategy-oriented performance management system.

Using BSC can make electric power enterprise no longer limited to the evaluation of business results, but pay more attention to the management of the basic business processes of enterprises. It can avoid the management model of the performance evaluation of electric power enterprise in the past, regardless of the results. Enterprises can no longer rely solely on the data of financial indicators to measure their development, add some non-financial indicators that affect the survival and development of enterprises, and closely integrate the corporate strategy to make up for the short-term behavior caused by traditional financial evaluation, which is beneficial to maximize the long-term interests of the company.

II. THEORETICAL OVERVIEW

A. The electric power enterprise Overview

1) Production and operation characteristics

Electric power enterprise is capital-intensive and technology-intensive enterprises. From preparation to operation, electric power enterprise has large-scale investment, high original assets, high operating costs, large production scale, complete production, supply and sales chains and out of stored. Therefore, its production management has the following characteristics [1]:

a) Production management characteristics

The production chain of electric power enterprise includes operation and maintenance. The operation personnel start the unit, use knowledge and skill to ensure that the generator set generates electricity and heat supply normally. After the unit is operated for a certain period of time, it is necessary to conduct regular classification inspection and comprehensive inspection. Since electric power enterprise generally aim at safe and stable power generation, the maintenance and repair links in electric power enterprise are more important than those in general enterprises. Maintenance is a complicated and sudden work. Therefore, the management of maintenance by electric power enterprise is backward, and it is difficult to formulate detailed work standards. The production of electric power enterprise is a continuous process, and there is no product storage, each production process is required to perform its duties. The cost increase caused by the interruption of production in electric power enterprise is enormous, and the impact of accidents is much greater than that of ordinary companies.

b) Financial management characteristics

Compared with the financial management of general manufacturing enterprises, the cost of main business is different. The products produced by electric power enterprises are electricity and heat, the products cannot be stored; the main income is power generation and heating income, and the main costs include variable costs such as fuel and water charges; fixed costs such as repair costs, material costs, equipment depreciation, and staff salaries. Due to the particularity of the electric power enterprise, there is basically no operating expenses, the management expenses are included in the main cost, shared by the electric heating products.

c) Characteristics of human resource management

The integration and automation of electric power enterprise are relatively high. The general monitoring personnel work after a period of training, those with a certain level of knowledge can do the job. Some new large installed capacity power plants have a small number of actual operators, while some old power plants have a large installed capacity and a large number of personnel. This is mainly due to the fact that the power system reform has not been long, and the historical personnel and problems of some old power plants have caused. All the old power plants are the key units that really need to improve the performance appraisal system.

d) Marketing management characteristics

There are no product quality problems in the products produced by electric power enterprise. There are only quantitative problems. The electricity price is set by the government, and the power generation quantity is also issued by the power grid dispatching center. Therefore, it is not necessary for enterprises to advertise a lot or go to marketing, which is different from the general manufacturing enterprises.

2) Characteristics of electricity enterprise performance management

The particularity of the production and management of electric power enterprise determines the management mode of electric power enterprise and also determines the characteristics of power enterprise performance management.

a) Diversity of power enterprise performance management

Traditionally, electric power enterprise has been seen as a type of manufacturing industry. In fact, the production activities of electric power enterprise span multiple fields, including power generation, heating, power design, and power sales. Therefore, when designing the performance appraisal system, the electric power enterprise must establish the target design; clarify the focus of performance appraisal.

b) Hierarchical of power enterprise performance management

From the organizational level of China's power system; there are two major power grid companies and five major power generation groups. Under the power grid company, there are large-scale grid companies and provincial, municipal, and county-level power grid branches. There are also hundreds of power plants under the five major power generation groups. From the highest strategic level to the lowest post executive

level, the performance appraisal is indispensable. There are performance appraisal of subordinate enterprises, subordinate departments, posts and personnel.

c) Complexity of power enterprise performance management

From the reality, most of the current performance management methods of China's electric power enterprise are based on the use of unified performance appraisal indicators, including performance, satisfaction, security and so on. Obviously, this single method is not universal, and it is difficult to get employees' recognition of performance management work, and even a monotonous system will cause employees to resent. The design of performance appraisal indicators for electric power enterprise must take into account the scientific nature of indicators and the inherent connectivity of indicators. The business of China's electric power enterprise from power generation to supply, from the city to the countryside, gradually to the world, it is clear that the use of unified performance indicators can't adapt to the complex and varied objective environment. All kinds of contradictions will increase the complexity of the performance appraisal indicator system.

3) Disadvantages of power enterprise performance management

In recent years, many electric power enterprises have introduced management concepts and methods, made a lot of attempts in performance management. But there is still room for improvement. The factors affecting and restricting performance appraisal mainly include the following aspects:

- The performance management system of electric power enterprises is not detailed enough, resulting in lack of pertinence in performance evaluation;
- In the power enterprise, the enterprise-department-post three-level performance appraisal is out of line, and there is no organic whole from top to bottom;
- The decomposition of job target responsibility is not clear. Managers and employees generally have no enthusiasm for performance appraisal. Performance appraisal is in the form;
- Some electric power enterprise have weak market and innovation awareness, constantly ignoring long-term performance;
- The performance evaluation of electric power enterprise lacks effective communication and management in the implementation process and the feedback stage, which cannot help them improve the problems in their work; the application range of performance evaluation results is limited.
- The purpose of performance evaluation of most electric power enterprise is to adjust the salary of employees, but they are rarely planned and implemented effectively from the perspective of department development and department management.

B. The BSC Overview

1) The BSC concept

The BSC is a performance evaluation system based on Robert Kaplan and David Norton's "Future Organizational Performance Measurement Method" in the past 90 years. In 1990, the financial performance indicators gradually more and more ineffective for modern enterprise organizations. The evaluation of enterprise performance by relying solely on financial indicators will affect many problems when the enterprises creating values. Probably replacing the exploration of financial performance indicators, they ultimately decided to use the concept of a scorecard that would summarize the performance indicators of all activities of the organization.

a) The BSC features

The Balanced Scorecard is centered on the company's strategy and forms an organic whole. It not only includes the financial accounting indicators in the traditional performance appraisal, but also supplements the performance appraisal indicator system through business indicators such as customer satisfaction, internal processes, learning and growth. In this way, the organization is able to track financial results and closely focus on intangible assets. The enterprise will increase their capabilities and gaining future growth potential. At the same time, the balanced scorecard brings strong support to the quality management of the enterprise, improves the overall management level. The enthusiasm of employees and the incentive effect on employees got improved.

b) The details of BSC

The balanced scorecard theory mainly introducing four dimension from the traditional financial perspective: the perspective of finance, customer, internal business process, learning and growth. The main contents of which are shown in the figure [2].

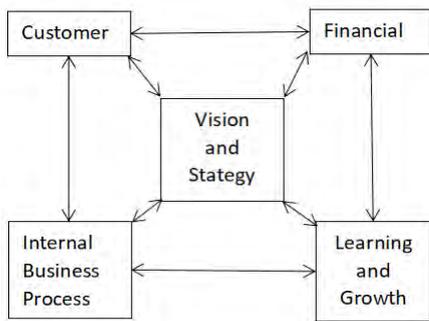


Fig. 1. Fundamental contents of BSC Index System

2) The advantages of BSC

The balanced scorecard has been continuously improved in the later research, and many scholars have supplemented the theory from different angles. The current Balanced Scorecard shows the following advantages [3]:

First, emphasizes the balance. Through the four levels of indicators, build a comprehensive, balanced system to reflect the development of the company objectively and effectively. From the perspective of business operations, balance the short-term goals and long-term goals of the

company. Balance non-financial and financial indicators from the perspective of the company's financial situation. From the perspective of the company's customers, balance the external personnel and internal personnel: the customer and the shareholder are the external personnel of the enterprise, and the employees are the internal personnel of the enterprise. The balanced scorecard comprehensively considers the internal factors and external factors of the enterprise, balances the interests of all relevant personnel. Finally, the Balanced Scorecard balances the results and causes, no longer results-oriented, begins to focus on the process.

Second, to provide companies with a guide to future actions. The Balanced Scorecard has always been guided by the completion of corporate strategic, which has led companies to constantly seek all the drivers that contribute to achieving strategic goals. This shows that the Balanced Scorecard is superior to other performance evaluation methods, and it overcomes the shortcomings that the past evaluation cannot find the real cause of the problem.

III. PERFORMANCE MANAGEMENT SYSTEM OF ELECTRIC POWER ENTERPRISE BASED ON BSC

A. Balanced scorecard design

When different companies use the Balanced Scorecard as their performance evaluation method, they must design a balanced scorecard system suitable for the long-term development of the company according to the nature of the enterprise and the strategic goal vision.

TABLE I. ELECTRIC ENTERPRISE'S FINANCIAL DIMENSION INDEX

BSC dimensions	Target	Indicators	Measures
Financial dimension	Increase electricity sales	Total increase of electricity sold	Improve the company's marketing input and service quality level
	Control cost	Reduce production costs	Increase technology capability and introduce new equipment
	Reduce sales expenses	Decrease in sales cost	Purchase electricity Online; Expand the scope of publicity
	Increase power generation efficiency	Full utilization of resources	Use new equipment, new methods and high efficiency energy to reduce resource waste
	Reduce Unnecessary expenses	Total expenditure reduction	Strengthen supervision function

TABLE II. ELECTRIC ENTERPRISE'S CUSTOMER, INTERNAL BUSINESS AND LEARNING & GROWTH DIMENSION INDEX

Customer dimension	Increase the convenience of purchasing electricity	System average account rate	Improving the power purchase system on the Internet
	Expand the market	Market share	Improving company service quality management and marketing management ability
	Increase residents' satisfaction	Customer loyalty	Enhance the service consciousness of enterprises
	Control voltage stability	Voltage standard	Upgrading the management level of transmission equipment and personnel
Internal business dimension	Improve equipment safety	Equipment failure rate	Equipment maintenance and repair
	Improve personnel safety	Incidence of personal accident	Strengthen the training of safety awareness for employees
	Safety education	Safety work status	Enthusiasm for staff participation
	Improving the quality of project management	Power grid renovation project	Management of quality level in construction projects
	Improving process management	Improvement of technology level	Design of scientific standard of power supply
Learning and growth dimension	Employees grow in the organization.	Investment in staff education	Provide internal training courses to encourage employees to receive further education.
	Improving information construction	Construction of information facilities	Enhance Smart grid construction

B. Determining the BSC scores

After the initial establishment of a balanced scorecard for electric power enterprise, more important is the comprehensive use of quantitative and qualitative indicators. Then selecting the key performance indicators of different levels of electric power enterprise [4]. The following table quantifies the performance indicators in the Balanced Scorecard.

TABLE III. THE BSC QUANTITATIVE INDICATORS

level	Specific description
Outstanding	Actual performance is significantly higher than expected.
Good	The actual performance has reached or exceeded the expected plan.
Normal	The actual performance is basically up to the expected plan.
Poor	Actual performance did not meet the expected plan. Obvious mistake

IV. THE EXPECTED EFFECT OF BALANCED SCORECARD IN POWER ENTERPRISE PERFORMANCE MANAGEMENT SYSTEM

Achieve dynamic management of the department. Each quarter's dynamic assessment can reflect the gaps and upgrade points between the current quarter and the previous quarter, thus continuously improving the comprehensive competitiveness [5].

Identify problems and correct internal employees. It also helps to strengthen communication between leaders and employees, create a more harmonious and mutually supportive departmental work atmosphere, and mobilize the enthusiasm of all employees [6].

V. CONCLUSION

In the future, optimizing the performance management system will be a very important means for electric power enterprise to gain competitive advantage. The use of the BSC performance evaluation system in electric power enterprise is not the ultimate goal. Compare the evaluation results in the operation process of the enterprise with the expected goals, find out the main failure causes, re-determine the evaluation indicators, and establish an effective performance management cycle. This has certain reference significance for its power enterprises to improve their competitiveness.

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