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Cost Accounting Analysis on Anshan Machinery Limited Liability Company Material Flow

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Abstract: Material Flow Cost Accounting is an important component of environmental management Accounting, by means of Material Flow analysis, enterprise accounts related Material Cost loss situation, makes the manufacturing Cost visualization, which is convenient for enterprise managers to enterprise production process of waste discharge point to control and improve, China's current related case research also less so. In this study, by using An Shan Machinery Manufacturing Company implement environmental management MFCA examples as the research object, in order to verify the applicability of the index system and the feasibility and to provide reference for other enterprise introducing MFCA.

Key words: Anshan machinery co., LTD., material flow, cost accounting, analysis

INTRODUCTION

Enterprise environment management didn't only improve their business enterprise, but also the need of environment supervision department, social public. Enterprise implement environmental management can not only reduce the "three wastes" emissions, increase the utilization rate of resources, but also can reduce enterprise's environmental risk, management cost and optimize enterprise working environment, improve labor efficiency and effect. Material flow cost accounting is of great significance as the enterprise internal production process, production process reengineering environmental management accounting method, the enterprise environment management, energy conservation and emission reduction.

Backyard (1965) published "urban metabolism" and "the U.S. economy material flow analysis", the two articles revealed on the material flow analysis research of the prelude.

Schmidt-black and Weizsacker's (1994) proposed a cause "physical form lose" the basic hypothesis according to four times the factor or ten times factor theory.

Strobe and Redman (2000) published the flow cost accounting, through the accounting methods to reduce the cost and reduce the environmental pressure, detailed description of the material flow cost accounting related content, including the material flow cost accounting of the basic ideas, objectives and methods.

Zhen (2007) at the conclusion of the foreign material flow cost accounting presented, based on the material flow cost accounting basic principle. Feng (2008) thought that the material flow cost accounting can realize enterprise operation and environmental protection of the organic unity.

COMPANY BACKGROUND OF MATERIAL FLOW COST ACCOUNTING IMPLEMENTATION

Anshan machinery co., LTD. was established in 1916, is located in An Shan city in Liao Ning province and is one of the largest enterprises in China's metallurgical machinery manufacturing industry, it has seventy years of development history. Anshan machinery limited liability company adhere to the people-oriented, science and technology. The construction machinery manufacturing company is the branch company, mainly engaged in construction machinery with the driver room, fuel tank, hydraulic oil tank, machine shed a production and operation activities. In January 2009, construction machinery manufacturing companies began to implement environmental management accounting, namely import material flow cost accounting and therefore established related management department-environment project room, mainly by the division general manager leadership, unified management, each production team directly involved in environmental matters propulsion.

In 2008, the economic crisis of construction machinery manufacturing company's influence is very big,

the company's sales began to drop, the unit product cost relative increase, internal resources use efficiency is low. It also require the company to choose corresponding methods to reduce enterprise material, energy consumption, improve the utilization rate of artificial, to reduce the unit cost of product, keep the competitiveness of enterprises. And part of the financial institution loans provide financial support must need enterprises to provide environmental assessment report, The social public also pay more and more attention to the corporate social responsibility, environmental protection responsibility and the enterprise environmental management work stand or fall may affect the enterprise product market share and so on, so from long-term interests look, the company also shall carry out environmental management work.

PROCESS OF MATERIAL FLOW COST ACCOUNTING IMPLEMENTATION IN COMPANY

The company has started to introduce material flow cost accounting system for the corresponding preparations from September to November in 2009.

Company material flow cost accounting implementation steps:

- First, the preparation. Determine a goal products, production line and process; According to the target process execution rough accounting and determine the volume center; Determine the analysis model and period; Determine the analysis of material object and its volume data collection method
- Second, data collection and sorting. Collecting, sorting every process of material type data and its input and waste quantity; Collecting, sorting system cost and energy cost data; Determine the system and energy cost distribution rules; Collecting, sorting each process on machine operation status data
- Third, the material flow cost accounting. Build a calculation model and input the data; Validate and analyze calculation results
- Fourth, recognition improves demand. Identify lists improve needs, including material loss and cost cuts
- Fifth, improve the project plan. Test material loss reduction room and its possibility; Accounting and evaluation through the material loss cut cost benefit, sure improvement priority plan and to improve the project plan
- Sixth, implement improvement

Finally, improvement effect evaluation. After improving the material input, waste quantity survey,

material flow cost accounting; After improving the full cost and negative product cost accounting, improve effect evaluation (Yonghee *et al.*, 2012).

Company material flow cost accounting: The management understand thoroughly situation of business production, select implementation object of the material flow cost accounting. Enterprise mainly has three production lines, namely: the tank production line, the driver chamber production line and machine shed a production line, because of the raw materials of the latter two production lines mainly rely on imported, the enterprise only do equipment and subsequent surface treatment work, not for processing work, so the company choose tank production line for material flow cost accounting introduction object, each production working procedure managed by special departments and the process is assembly line process, material is clear, it can be set up separately each working procedure for volume center. After selected production line, analyzing the production process and understanding he input and output of each process, identify center for accounting volume, carries on the simple material flow cost accounting and find out the waste emissions more key volume center.

Based on the analysis of the key working procedure Table 1, it is concluded that process may produce waste reason: phosphating link, mainly adopts "surplus water" homework, although can save fuel tank cleaning time, but this is cause water waste and medicament waste main reason, suggest to periodic discharge operation. Pressure testing process of the main purpose of this study is to examine whether there is fuel tank leakage, when the pressure of the water contains too much granular pollutants, visibility variation, it must carry on in water, but as long as the particles will waste water filter out, can use again, suggest establish circulating water system.

Table 1: Key process positive and negative product cost Accounting result list

Process/project	Project phosphating	Test	Wash	Painting
Way before work sequence input				
Quantity (kg)	157856	182470	183145	185412
Amoun (yuan)	842959	1368525	1373587	1401715
This way working sequence new input				
Quantity (kg)	1105056	332471	34368	5637
Amoun (yuan)	5856797	2493532	257760	42616
Total				
Quantity (kg)	1262912	514941	217513	191049
Amoun (yuan)	6699756	3862057	1631347	1444331
Are products				
Quantity (kg)	1262912	514941	217513	191049
Amoun (yuan)	6487682	3862057	1631347	1444331
Negative products				
Quantity (kg)	0	0	0	0
Amoun (yuan)	212074	0	0	0

Source: According to An Gang building machinery manufacturing branch 2009-2010 years related cost data sorting and processing

Wash with link is the main hot water and by high pressure nozzle for automatic operation, improve the possibility is not big, but heating energy is kerosene, the proposed use of phosphate link with steam heating method, just from the boiler workshop on a pipeline can. Spraying process is mainly to the tank to paint job, this process "wash gun" link about cause paint thinner 22% of the loss, the proposal purchases new distillation recovery unit for recycling.

IMPLEMENTATION EFFECT OF MATERIAL FLOW COST ACCOUNTING

The company set product use reference list, the common materials and vice material the use of management and require employees must according to Table 2 for standardizing operations and effective to eliminate the vice anticipates the materials waste serious situation.

According to the fuzzy comprehensive evaluation method, calculate the level of evaluation result vector Table 3: "Environmental performance" results vector calculation, the weight vector WA and comment membership degree vector RA is as follows:

$$WA = (0.1643 \ 0.1643 \ 0.1280 \ 0.1280 \ 0.1048 \ 0.1312 \ 0.0997 \ 0.0796)$$

$$RA = \begin{pmatrix} 0.6 & 0.2 & 0.2 & 0 \\ 0.2 & 0.5 & 0.3 & 0 \\ 0.5 & 0.3 & 0.2 & 0 \\ 0.2 & 0.5 & 0.2 & 0.1 \\ 0.3 & 0.3 & 0.3 & 0.1 \\ 0.2 & 0.4 & 0.3 & 0.1 \\ 0.1 & 0.6 & 0.2 & 0.1 \\ 0.2 & 0.4 & 0.3 & 0.1 \end{pmatrix}$$

$$A = WA * RA = (0.2060 \ 0.3601 \ 0.2251 \ 0.0543)$$

After normalization, A = (0.2466 0.4310 0.2574 0.0650). According to the maximum membership degree principle, the company's environmental performance comprehensive rating is "good".

SUCCESS OF MATERIAL FLOW COST ACCOUNTING IMPLEMENT

Implementation of material flow cost accounting will has a great help to change "high investment, high pollution" economic growth mode. Companies have many worth reference place in the implementation of material flow cost accounting in the process:

Table 2: Company material flow cost accounting during the implementation of the overall performance

Project/month	09.12	10.1	10.2	10.3	10.4	10.5
Input						
Weight(t)	8746	8537	8612	8433	8389	8744
Amount(million)	9.0084	7.6833	8.0953	7.7584	9.2279	3.4976
Positive products						
Weight(t)	1025	923	1013	1542	1694	894
Amount(million)	1.0558	0.8307	0.9522	1.4186	1.8634	0.3575
Negative products						
Weight(t)	7721	7614	7599	6891	6695	7850
Amount(million)	7.9526	6.8526	7.1431	6.3397	7.3645	3.1401
Production sets						
Fuel tank(table)	4578	4311	4427	4612	4517	4310
Hydraulicfluid						
Chamber(table)	6414	4356	5102	5574	4121	4019
Rate of good product						
Quantity (%)	15.42	12.87	12.64	12.94	15.18	14.65
Amount(%)	95.98	94.12	90.17	92.79	93.84	92.87

- Firstly, company first in a production line for trial implementation and not the whole company use material flow cost accounting, such already reduced the risk of failure, enhanced the maneuverability, on the basis of summing up experience, is more advantageous to the material flow cost accounting overall implementation. Secondly, not accounting the whole tank production line of all costs, but accounting the line material cost and waste disposal cost, because the two aspects the relation with environment more closely and directly influence the enterprise environment cost expenditure, relative to the above two cost, the system cost and energy cost and the effects to the environment relatively less and energy cost need to pass conversion can manifest the resources, the environment influence, the maneuverability is poor

The company has made good achievements, but in the result, the enterprise internal management to improve there are still shortages, this study Suggestions are as follows:

- First of all, Environmental management organization setting is not reasonable, shall join the financial department and technology department related personnel. Through the material flow cost accounting to find enterprise production related technical personnel do analysis work, obviously against enterprise further mining potential improve potential. So, the proposal is enterprise environmental management organization to join financial personnel and technical personnel, material flow cost accounting for better implementation will have a great help
- Secondly, the enterprise internal information can't share, should be responsibility clear. Environmental

Table 3: Environmental performance evaluation index

Company environmental performance	A1	A2	A3	A4	A5	A6	A7	A8	Wi
A1	1	1	2	2	3	2	4	5	0.1643
A2	1	1	2	2	3	2	4	5	0.1643
A3	1/2	1/2	1	1	2	1	2	3	0.1280
A4	1/2	1/2	1	1	2	1	2	3	0.1280
A5	1/3	1/3	1/2	1/3	1	1/2	1	2	0.1048
A6	1/2	1/2	1	2	2	1	2	4	0.1312
A7	1/4	1/4	1/2	1/2	1	1/2	1	2	0.0997
A8	1/5	1/5	1/3	1/3	1/2	1/4	1/2	1	0.0796

CR = 0.0011 < 0.1

management work, involves many aspects, often need and other departments to communicate cooperation. So, the enterprise ought to be in clear environmental management department responsibility at the same time, gives corresponding rights, request other departments give data and other aspects of support, so that we can guarantee the material flow cost accounting of the normal operation of the effective

Finally, enterprise should strengthen internal control mechanism, to material recipients of strict control, achieves the responsibility to the people and set up a corresponding rewards and punishments measures. The implementation of the material flow cost accounting, is expected to change "high investment, high pollution" economic growth mode has a great help.

CONCLUSION

Iron and steel enterprise's environmental problems are more serious, although in recent years, the environmental pollution has be controlled a little, but high investment and low output of economic growth mode still has not changed. Anshan machinery co., LTD. make the material flow cost accounting as enterprise environmental management means, can not only reveal the effectiveness of environmental management, but also can help enterprise knowledge management of insufficiency, from the business enterprise level to establish material flow cost accounting analysis system will have important practical significance.

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