SUSTAINABLE DEVELOPMENT OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM – ACTIVE UPGRADING OF CORPORATE SAFETY CULTURE

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ABSTRACT

In China, occupational health and safety management system (OHSMS) has already been taken as an indicator of safety management standard and sustainable development ability for modern enterprises. Status of OHSMS in the management strategy of enterprises in principle will be discussed in this paper. Sustainably developing and improving the management system is the key to success. Safety culture in the corporation should be actively upgraded.

1. INTRODUCTION

The development of occupational health and safety management system (OHSMS) is the result of the organization’s desire to pursue better occupational health and safety (OHS) and economic effectiveness. The sustainable development strategy of an organization is not only reflected in the increase in the production value of the organization, but should be evaluated together with other aspects such as economic effectiveness, utilization of resources, occupational health and safety, and environmental protection. It should be emphasized that economic effectiveness and OHS are interrelated and inseparable. Short-term and long-term benefits, partial and the overall benefits should be treated as a whole. A new production management style should be implemented to utilize effectively renewable resources including human resources, and people should learn to value and protect themselves.

All management systems such as OHS, environmental, quality, finance, information safety, sales and account management are targeted to get better profits for the organization. Therefore, it should first be made clear that OHSMS serves for the organization’s economic performance. OHSMS is also a process of continuous development and improvement. The establishment of corporate safety culture requires that the organization has to work out a safety culture that is most suitable for the particular environment and development of the organization itself.

Changes have taken place in the corporate mechanism, management strategy, personnel system and the external environment. For example, the safety management system has changed from business-oriented to people-oriented; the concept of marketing has moved from production-oriented to market-oriented. These illustrated that the organizations have to adjust their existing management rationale, and re-establish their corporate culture. Safety culture is an important part of corporate culture.

2. OHSMS – THE PRODUCT OF DEVELOPMENT OF SAFETY MANAGEMENT

2.1 Positioning of OHSMS and Development Standard

In principle, an OHSMS can bring many advantages to an organization:

- Renewing the safety management rationale;
- Improving the safety management system;
- Regulating the safety behavior;
- Establishing corporate safety culture; and
- Gaining credibility.

However, a question is raised in practice:

To what extent the organization’s performance has been upgraded by an OHSMS?

Apart from the operational standard of the management system, another key question is:

How is OHSMS positioned in the organization?

OHSMS is a tool for the management personnel. The key to success is whether it can be used effectively. The relationship between the evolution of safety management and positioning of OHSMS in the enterprise can be shown as in Fig. 1.
Each management method has its own lifecycle and operation principles. Different orientation of safety management determines the purposes of OHSMS, the main conflicts and problems of OHSMS, and also the standard of OHSMS in different organizations.

- **Management system as a single method**
  When management system is applied as a single management method, for example, if only a health and safety monitoring system is set up, the management system is only partially professionalized, the overall management system is not yet in place. In this case, only part of the people in the system are concerned.

- **Management system as a common method**
  When management system is employed as a common method, that is, all specific aspects of the organization are professionally managed by using the theory and operation mode of management system, a standard system of the organization can be established and all departments will support OHS standardized work.

- **Management system as strategic management skills**
  When management system is taken as strategic management, the corporate development strategy can be implemented. Senior personnel should be involved in OHSMS in order to achieve the objectives by actively working hard. At this stage, the management system becomes an effective means to achieve the strategic objectives. Achievement of the objectives can be assessed through quantified indicators and measures for improvements can be determined through regular examinations.

As shown in Fig. 2, the evolutions of market, competition and safety management are consistent.

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**Evolution of safety management**
- Safety guarantee
- Traditional safety management tasks
- Safety management
- OHSMS

**Positioning of OHSMS in the enterprise**
- Fundamental management tools
- Single management method
- Common safety management methods
- Strategic management

**Fig. 1: The relationship between the evolution of safety management and positioning of OHSMS**

**Fig. 2: Consistent evolution processes of market, competition and safety management**
2.2 Strategic Management - OHSMS

OHSMS emphasizes the importance of safety culture and is based on safety behavioral science. It aims at achieving “0 disease, 0 accident, 0 injury”, with the objectives of ensuring the health and safety of employees, and accident prevention. The management style of using OHSMS as a guarantee is a kind of strategic management. OHSMS is emphasized by putting in the strategic planning of the enterprises to have synchronized planning, implementation and development. Management of other aspects are integrated to contribute to the benefits and profits of the organization.

2.3 OHSMS

In a modern corporate system, the organization uses a unified and systematic method and procedural control to carry out scientific management, so that the health and safety management system covers all corporate activities and all employees. OHSMS is a series of interrelated or interacted factors set up for establishing and achieving the occupational health and safety policies and objectives. These factors include developing, implementing, achieving, reviewing and maintaining the required organizational structure, planning of activities, responsibilities, practices, procedures, processes and resources for the OHS policy. OHSMS is the basis and guarantee for healthy development of an organization.

3. CONTINUOUS IMPROVEMENT OF THE MANAGEMENT SYSTEM

The ultimate aim of improving the management system is to enhance efficiency and effectiveness. The only assessment criterion for the effectiveness of a management system is its significance. The aim of a management system is to develop core competitive power, of course, including enhancing the corporate safety culture.

3.1 Requirements for Continuous Improvement of OHSMS

Continuous improvement of the management system refers to the cyclic activities of improving the system’s ability to satisfy the requirements. It is emphasized that setting up improvement objectives and finding ways to improve is a continuous process. Through audit, information analysis, management evaluation or other methods, corrective measures and preventive measures are identified. These measures can be applied for the planning and management of daily improvement activities. For more important long-term improvements that might be related to changes in the existing products and demand for resources, the objectives of the improvements and overall requirements should be considered. The current situation should be analyzed to determine and implement a suitable policy, and then evaluate the results of improvements.

Continuous improvement of OHSMS emphasizes the process of enhancing the management system, the aim of which is to improve the overall OHS performance according to the organization’s OHS policy.

Continuous improvement can be considered in two aspects: the continuous process of self-improvement of OHSMS and the continuous reduction in health and safety problems. These two processes are complementary to each other.

The process of continuous improvement does not necessarily have to take place in all aspects of the activity at the same time because continuous improvement of the management system cannot be done in just one step, but should follow the Plan-Do-Check-Action (PDCA) operation mode to improve gradually and continuously.

3.2 Operation Mode of Continuous Improvement of OHSMS

The operation mode of OHSMS, i.e. PDCA, includes planning, implementation, checking and improvement as illustrated in Fig. 3 and Fig. 4. The mode itself is a dynamic, ever-changing spiraling up process.

When OHSMS is in operation, it is actually also in the process of continuous improvement following the cyclic operation mode of PDCA.

3.3 The Process of Continuous Improvement of OHSMS

According to the cyclic mode of PDCA, the above continuous improvement activities can be grouped into four stages:

- Plan: analyze and evaluate the current situation to identify the areas for improvement; set up the objectives of improvement; find out and select a suitable method to achieve the objectives;
- Do: implement the selected method;
- Check: measure, validate, analyze and assess the results to confirm that the objectives have been met; adopt the changes;
- Action: when necessary, assess the structure to identify the areas for improvement through audit and management evaluation.

The schematic diagram for an example is shown in Fig. 5.
Revision
Rules should only be revised when they are necessary for supporting the needs of the process; and should be based on statistics.

Setting up rules
Rules should be manageable. Do not set up rules that cannot be implemented.

Implementing the rules
Be strong to enforce the rules under any circumstances. Measure, follow-up & support. Accountability is the key.

Training
All employees of the corporation should understand the rules and the reasons behind.
3.4 Different Levels of Continuous Improvement of OHSMS

Improvements can be divided into three levels. Different methods are used for different levels:

- Strategic offensive improvement: modern management strategy such as building up task force of safety engineers; optimum design of machines, equipment and tools; and implementation of business plans.
- Continuous preventive improvement: preventive and corrective measures of the management system such as regular upgrading of the process; analysis of failure mode and assessment on the impacts.
- Mass basic level operational improvement: management team for daily improvements on maintenance, production safety and problem-solving in sites.

4. KEY ITEMS IN THE PROCESS OF IMPROVEMENT

4.1 Monitoring and Measuring

The monitoring mechanism can be divided into three levels:

- Level 1: Monitoring and measuring: the management personnel should carry out the monitoring strictly according to the specified frequency and method, especially on the suitability of system documents, whether the relevant responsibilities have been carried out; the application of the system document, procedural documents and guidelines. Items of inspection include clothing and personal protective equipment; locations of staff; human response, tools and equipment; and procedures.
- Level 2: Internal audit: to carry out self-regulation and self-evaluation to ensure self-improvement. An effective internal audit relies on a high quality internal audit team.
- Level 3: Management assessment: to evaluate whether the current status of the system satisfies the policy requirements; the level of achievement of the policy and target indicators; compliance and effectiveness of the findings of the internal audit and system documents; solutions to problems.

The operation of the monitoring mechanism is a process of self-regulation and self-improvement. It is also a process for getting familiar with OHSMS and team training. Therefore, the work of monitoring mechanism has to be done thoroughly and seriously.

4.2 Enhancing the Control of Document Management

Not only that a set of documents has to be set up in a management system, document management should be enhanced to ensure the documents are applied in real practice.

- First, the management level should fully understand the policy and objectives of setting up the documents. They should also be clear about the significance of the management system to the organization’s strategy, and give much importance to it. This is the foundation and guarantee of the system operation.
- Secondly, make good use of the procedural documents, and control the relevant processes.
- Finally, pay attention to the use of guidelines, and keep records and forms as evidence. What have been written down should be achieved, and what have been done should be traceable and verifiable.

4.3 Contingency Planning

In a management system, “contingency planning” is the major element in the handling of sudden incidents. When a management system has not yet been established in the organization, this part has often been neglected. In the process of establishing a management system or continuous improvement, contingency plans should be set up based on the characteristics and potential hazards of the organization itself. For example, planning on emergency evacuation; establishing teams to respond in emergency; and control of hazardous materials. The outbreak of Severe Acute Respiratory Syndrome (SARS) has given a big lesson on how to evaluate potential dangers and hazards and set up the corresponding contingency plan to protect our lives and properties.

Besides, continuous improvement takes place throughout the operation of the whole management system. The organization should be prepared to oversee every single item of the system and to keep on improving continuously.

5. CONTINUOUS IMPROVEMENT OF OHSMS – ESTABLISHMENT OF CORPORATE SAFETY CULTURE

Corporate safety culture is reflected in different aspects including the safety concept and behaviour of employees; decision attitude and directional behaviour of the management level; employees’ response toward safety and the requirements of
operation codes. Continuous improvement of OHSMS actually promotes the development and creation of corporate safety culture.

5.1 Continuous Improvement – Do Not Follow Blindly
Continuous improvement is required, but care should be taken not to improve one or two items just to satisfy the requirements. For any non-compliance found in the audit, corrective measures should be set up through systematic analysis to prevent having incidents with the same cause. Corrected results should be justified with evidence by keeping data and records. The results should not be judged subjectively.

5.2 OHSMS – From Documentation to Personalization and then to Digitalization
- **Problems of documentation** There are problems such as not sufficiently quantified, formalism, bad quality, low efficiency and effectiveness. Too many documents are being laid aside and neglected, the lack of continuity seriously affects the system operation.

- **Problems of personalization** The low level of dependence and closeness between the management system and the operation of the organization is reflected in the low recognition and utilization of the management system. The system design and operation mode have not been integrated well with the existing administrative management due to the lack of consideration of human factors, complicated documents and structure, the use of obscure words, and unavailability of documents. Employees are reluctant to use the system because they are not familiar with it. The management personnel are concerned only about the designated activities, which the management system has not become the supporting means for fulfilling the major tasks of the year, the performance index and the measures implemented. It has not become the tool for management in various departments, nor a guarantee for reduced accidents, better health and increased working efficiency. On the contrary, it has increased the burden and made more troubles, and is therefore rejected or treated indifferently. In setting up the management system, the structural levels of documents should be minimized and the information for every person should be gathered in one volume for easy availability.

- **Problems of digitalization** OHSMS standard has listed out the requirements, but digitalized and quantified framework and method are not provided, therefore it is not sufficient to rely just on the standard. At present, effective management tools such as the 6σ-method, malfunction mode and results analysis are used to implement the strategic items and the concept of digitalized management system is proposed. In the system improvement of OHSMS and daily work, applying modern statistics technology should become the trend of digitalization pursued by modern enterprises.

6. CONCLUSION
The development of OHSMS has brought great benefits to international and national enterprises. It is in itself a process of continuous improvement, where the operation mode of PDCA forms the basis. Through continuous improvement, the organizations are pursuing better economic performance, more advanced technology and a characteristic corporate image. International standards and modern management concept are introduced into the enterprises for self-expansion and development, and also for the creation of corporate safety culture. The establishment and creation of corporate safety culture can enhance continuous improvement of OHSMS, and that leads to the virtuous cycle of continuous improvement of OHSMS and the promotion of corporate culture.

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