

## A Study on the Better Operation of Occupational Safety and Health Management Systems

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**Abstract :** This study was conducted to identify the characteristics of occupational health and safety management systems around the world, to survey the implementation of OHSMS in Korean companies, to find problems and corrective measures, and to understand the opinions of top management about OHSMS. Questionnaires on the operation of occupational health and safety management systems in Korean manufacturing companies were carried out. Occupational health and safety management systems around the world, including OHSAS 18001, BS8800, KOSHA 18001, VPP, J-OHSMS, were reviewed. In order to implement an occupational health and safety management system successfully, it was found that the management should consider occupational health and safety as important, provide employees with necessary training, and have a strong commitment to occupational health and safety.

**Key words:** Occupational Health and Safety Management System (OHSMS), KOSHA 18001, OHSAS 18001, K-OHSMS 18001

### 1. Introduction

An occupational health and safety management system (OHSMS) is a process by which all members and related parties of an organization are involved in the establishment, implementation, achievement, review, and maintenance of its occupational health and safety policy in order to prevent an occupational accident and make the work environment more clean and safe. Many organizations and certification bodies around the world have developed and established their own OHSMSs, including BS 8800 and OHSAS 18001. In Korea, the Korea Occupational Safety and Health Agency and the Korean Accreditation Board also developed KOSHA 2000 (revised to KOSHA 18001 in 2003) and K-OHSMS 18001 in 1999 and 2001, respectively.

Today occupational health and safety become an important issue in business management, thus it is necessary to carry out a systematic study on OHSMS. The occupational health and safety management is recognized as not only a moral matter but also an approach to improve the transparency, productivity, and competi-

tiveness of business. In order to make the occupational health and safety an essential element in decision-making for effectively preventing an occupational accident, it is required to present the effects of the health and safety management system. Although OHSMS has been developed and implemented by many major companies in Korea, studies on its implementation and effects have rarely been carried out. Therefore, it is necessary to perform a systematic study to identify the worldwide trends, implementation, effects, and possible corrective measures of OHSMS.

The purposes of this study include: 1) to analyze the worldwide trends of occupational health and safety management systems; 2) to survey the application and implementation of occupational health and safety management systems by Korean companies (focused on KOSHA 18001); 3) to identify and present the effects and benefits of implementing the occupational health and safety management system to encourage the top management to have a commitment to occupational health and safety; 4) to propose any possible corrective measures for occupational health and safety management systems.

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## 2. Methods

### 2.1 Worldwide Trends

The occupational health and safety management systems developed in the USA, the UK, and Japan were reviewed to analyze their differences and trends.

### 2.2 Implementation by Korean Companies

KOSHA 18001 certified 230 manufacturing companies were asked via mail to fill a self-administered questionnaire, which was verified by the Test-Retest method, about the background and purpose, implementation, effects, and corrective measures of their OHSMS. A total of 128 responses were analyzed.

### 2.3 Commitment of Top Management

Another questionnaire was conducted with top managers of 100 companies, which were selected out of the members of the Korea Employers Federation in consideration of their location and size. Answers from 65 companies were obtained.

### 2.4 Corrective Measures

Based on the study and questionnaire results, some possible corrective measures of OHSMS applied in Korea were proposed.

## 3. Results

### 3.1 Worldwide Trends

As shown in Table 1, many health and safety management systems have been developed since the Health and Safety Executive (HSE) in the UK first made HS(G)65 in 1991. Most of those standards were independently developed by non-governmental organizations except for the HS(G)65 developed by HSE. One of the characteristics in the standards is that they provide guidelines to be followed voluntarily rather than be designed for certification such as ISO 9001 or ISO 14001.

### 3.2 Implementation by Korean Companies

Table 2 shows the general characteristics of respondents.

Companies regarding occupational health and safety as more important answered that their OHSMS was effective in accident prevention. Table 3 shows the results of the question on the necessity of OHSMS.

The objective of developing OHSMS was shown in Table 4. The principle objective of developing their occupational health and safety management system was the proactive control of risks in occupational health and safety.

As shown in Table 5, the conditions for successive operation of OHSMS were workers' involvement, com-

**Table 1.** Worldwide OHSMS

Country	Standard (Year)	Developer	Type	Remarks
Korea	KOSHA 18001 (1999)	Korea Occupational Safety and Health Agency, Ministry of Labor	Certification Standard	- Developed based on BS 8800, DNV-ISRS, OHSAS 18001, and ILO model - Accreditation / certification
	K-OHSMS 18001 (2001)	Korea Accreditation Board, Ministry of Commerce, Industry, and Energy	Certification Standard	- Developed based on OHSAS 18001 - Accredited by KAB; certified by another certification body
Japan	OHSMS (1996)	Japan Industrial Safety and Health Association	Assessment	- Designed specifically for Japan - Assessment
UK	HS(G)65 (1991)	Health and Safety Executive (HSE)	Guidelines	- First health and safety management system - Voluntarily followed in workplaces
	BS 8800 (1996)	British Standards Institution (BSI)	Guidelines	- Developed based on HS(G)65 and ISO14001 - Guidelines (Assessment if wanted by company)
USA	VPP (1982)	Occupational Safety and Health Administration	Certification	- Close to index - Certification / incentives
	OHSMS (1996)	American Industrial Hygiene Association (AIHA)	Guidelines	- Developed considering the specific situations in USA
International	OHSAS 18001(1999)	13 international certification bodies (including BSI and DNV)	Certification Standard	- Developed based on ISO9001 and ISO14001 - Integration of individual standards

**Table 2.** General characteristics of respondents (n=128)

Variables		Number of respondents	Percentage (%)
Number of workers	< 300	65	50.8
	300-1000	37	28.9
	≥ 1000	21	16.4
	Other	4	3.1
	No response	1	0.8
Years of employment	< 5years	18	14.1
	5-10 years	48	37.5
	10-20 years	44	34.3
	≥ 20 years	12	9.4
	No response	3	2.3
Age	Miss	3	2.4
	< 30	11	8.6
	30-40	74	57.8
	≥ 40	41	32.0
	Other	2	1.6
Type of company	Local company	98	76.6
	Multinational company	16	12.5
	Other	8	6.2
	No response	6	4.7

mitment of top management, education and training, and proper implementation in that order. The support of government was answered to be least required.

In companies that answered they need to integrate their OHSMS with existing systems and their objective of developing OHSMS was the active response to related parties' pressure in health and safety, OHSMS was more effective on the prevention of accidents. The

**Table 4.** Objectives of developing OHSMS

Objective	Number of answers	Percentage (%)	Multiple answer (%)
Proactive control of health and safety risks	105	37.8	84.0
Systematic approach for accident prevention and continual improvement	27	9.7	21.6
Active response to related parties' pressure in health and safety	13	4.7	10.4
Satisfaction of customers needs	52	18.7	41.6
Voluntary response to relevant laws and regulations	31	11.2	24.8
Fulfillment of social responsibility	48	17.3	38.4
Elimination of managerial risks related with health and safety matters	2	0.7	1.6
Reduction of managerial burden related to the cost for safety	0	0	0

**Table 5.** Conditions for successive operation of OHSMS (multiple answers) (n=128)

Condition	Very necessary	Somewhat necessary	Not sure	Rarely necessary	No answer
Integration with existing systems	76	35	8	1	8
Commitment of top management	85	30	6	1	6
Education and training	76	36	8	0	8
Workers' involvement	91	20	6	1	10
Proper implementation	81	26	4	0	9
Support of government	63	35	16	3	11

**Table 3.** Necessity of OHSMS.

	Local company	Multinational company	Other	No answer
Yes	151 (93.2)*	16 (100.0)*	8 (100.0)	7 (77.8)
No	7 (4.3)	0 (0.0)	0 (0.0)	0 (0.0)
No answer	4 (2.5)	0 (0.0)	0 (0.0)	2 (22.2)
Total	162 (100.0)	16 (100.0)	8 (100.0)	9 (100.0)

\* p < 0.05

**Table 6.** Departments managing OHSMS (n=128)

Department	Number of Answers	Percentage (%)
Safety and health related department	106	82.8
OHSMS dedicated department	9	7.0
Safety and/or health manager belonging to another department	6	4.7
Other	7	5.5

companies that responded they did not need to integrate their OHSMS with existing systems and received an external consulting in whole or in part showed that their OHSMS was less effective on accident prevention.

Table 6 shows that in most companies OHSMS is managed by their safety and health related department. In companies where the safety and health related department manages their OHSMS, OHSMS was generally more effective.

Many companies (58.6%) handled the certification processes by themselves. This was because: for the development of their quality management systems and/or environmental management system about 70 percent

of companies depended on external consulting organizations; for KOSHA 18001, they established their own specific OHSMS by themselves with the support from the Korea Occupational Safety and Health Agency and their experiences for the quality and/or environmental management system.

As shown in Table 7, when developing and implementing OHSMS, many companies had difficulty in risk assessment and operation management and needed help from external professional organizations.

To the questions about the propriety of the cost of OHSMS certification, 75 percent of companies answered the cost was proper or moderate. In addition, 85.1 percent answered that the cost of facility improvement and operation during the development of their OHSMS was proper.

Table 8 shows the reasons of workers' low involvement in OHSMS. The principle reasons were the weak commitment of top management to health and safety and insufficient training.

As a means to increase the workers' involvement, the encouragement through labor union (50.8%) and the establishment of clear policies and organizational goals (29.8%) were mostly answered.

**Table 7.** Difficulties when developing and implementing OHSMS (n=128)

Difficulty	Number of answers	Percentage (%)	Multiple answer (%)
Policy	5	1.8	4.0
Risk Assessment	80	29.4	64.0
Compliance with laws	24	8.8	19.2
Goal achievement	16	5.9	12.8
Responsibility	11	4.0	8.8
Training and communication	22	8.1	17.6
Documentation	24	8.8	19.2
Operation	23	8.5	18.4
Inspection and correction	14	5.1	11.2
Audit	27	9.9	21.6
Management review	16	5.9	12.8
Unnecessary	10	3.7	8.0
Total	272	100.0	217.6

Table 9 shows the effects of implementing OHSMS. Many companies answered the increase in safety consciousness of the management (44.5%), the prevention of accidents (38.3%), the increase in safety consciousness of workers (37.5%), and the compliance with laws (34.4%). The effect on the improvement of quality and

**Table 8.** Reasons of workers' low involvement in OHSMS (n=128)

Reason	Number of answers	Percentage (%)	Multiple answer (%)
Operation oriented to quality and production	31	16.3	50.8
Short training for health and safety	51	26.8	83.6
Less understanding of OHSMS	22	11.6	36.1
Weak commitment of top management	57	30.0	93.4
Insufficient participation of supervisors	29	15.3	47.5
Total	190	100	311.5

**Table 9.** Effects of implementing OHSMS (multiple answers) (n=128)

Effect	Very effective (%)	Somewhat effective (%)	Not sure (%)	Somewhat ineffective (%)	Not effective (%)	No answer (%)
Prevention of accidents	49 (38.3)	53 (41.4)	20 (15.6)	4 (3.1)	(0)	2 (1.6)
Compliance with laws	44 (34.4)	58 (45.3)	16 (12.5)	5 (3.9)	1 (0.8)	4 (3.1)
Effective control of health and safety	41 (32.0)	61 (47.7)	17 (13.3)	4 (3.1)	1 (0.8)	4 (3.1)
Positive effects on quality and productivity improvement	16 (12.5)	53 (41.3)	46 (35.9)	6 (4.7)	3 (2.3)	4 (3.1)
Increase in safety consciousness of the management	57 (44.5)	45 (35.2)	18 (14.1)	5 (3.9)	1 (0.8)	2 (1.6)
Increase in safety consciousness of workers	48 (37.5)	51 (39.8)	20 (15.6)	6 (4.7)	(0)	3 (2.3)
Improvement of company's image	40 (31.3)	62 (48.4)	17 (13.3)	7 (5.5)	(0)	2 (1.6)

productivity was moderate.

As shown in Table 10, almost all the companies responded that the largest achievement by implementing their OHSMS was the prevention of accidents, but the lowest was the financial improvement.

Table 11 shows the requirements for better development and implementation of OHSMS. As the requirements, many companies chose the reduction in occupational accident insurance rate, and next the exemption of government's control in occupational health and safety and the development of performance indicators

To the questions about the corrective measures for OHSMS, the companies answered it would be necessary to maintain the existing system, to establish an assessment and ranking system, and to provide a ground for the regulatory execution of the Industrial Safety and Health Act.

### 3.3 Commitment of Top Management

As shown in Table 12, to the questions about the

**Table 10.** Achievement by implementing OHSMS (n=128)

Achievement	Number of answers	Percentage (%)	Multiple answer (%)
Productivity	24	10.8	18.8
Quality	6	2.7	4.7
Prevention of accidents	114	51.1	89.1
Financial improvement	3	1.3	2.3
Improved company's image	71	31.8	55.5
Other	5	2.2	3.9
Total	223	100.0	174.2

**Table 11.** Requirements for better implementation of OHSMS

Requirement	Number of answers	Percentage (%)
Reduction in occupational accident insurance rate	69	53.9
Exemption of government's control	35	27.3
Development of performance indicators	14	10.9
Public relations for the public	8	6.3
No answer	2	1.6

**Table 12.** Achievements by implementing OHSMS

Achievement	Number of answers	Percentage (%)
Productivity	26	40
Quality	6	9.2
Prevention of accidents	51	93.8
Financial improvement	5	7.7
Improved company's image	26	40
Other	2	3.1

achievements by implementing OHSMS, top managers answered that the prevention of accidents, the productivity, and the improved company's image.

## 4. Discussion and Conclusions

For the successive operation of OHSMS, the involvement of both the workers and the management is essential. To strengthen the commitment of the management to OHSMS, the positive effects of implementing OHSMS should be presented. For the involvement of workers in OHSMS, it is required to encourage the labor union, to establish clear policies and organizational goals, and to provide effective training. In addition, related programs for occupational health and safety should be given to subcontractors. As the top management takes the responsibility for occupational health and safety, they need to involve all the experts in occupational health and safety, system, and process improvement in the implementation of OHSMS.

In order to effectively implement and operate OHSMS, it is also necessary to provide trained human resources and financial assistance. Especially for the areas needing expertise such as risk assessment, it is required to provide education and training to obtain necessary experts.

As it was found that many companies had difficulty in risk assessment and operation management and needed help from external professional organizations when developing and implementing OHSMS, it is necessary for the government or related organizations to provide assistance in training for risk assessment and operation management. In addition, the best effects of implementing OHSMS were the prevention of accidents and the improvement of productivity and company's image. These effects would be helpful for encouraging the top management to have the stronger commitment to occupational health and safety.

As the corrective measures of OHSMS, it was found to be necessary to keep implementing the existing system and to adopt the assessment and ranking system for OHSMS in the future.

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