

# Factors Affecting the Planning and Implementation of Occupational Health & Safety Management System

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## Abstract

This paper presents the findings of a study on some of the major factors that affect the planning and implementation of a Safety Management System (SMS) of an international transport utility company. The SMS was designed within a risk-based framework to cover a wide spectrum of activities and operations, employees and contractors. The review of the System highlighted some deficiencies that may be found in other similar organizations.

The evaluation model was based on the “7 Guiding Principles” developed by the Department of Energy of the United States, namely: (i) Policy, Leadership and Worker Empowerment; (ii) Roles, Responsibilities and Accountability; (iii) Competence Commensurate with Responsibility; (iv) Balanced Priorities, Implementation and Planning, (v) Standards and Requirements; (vi) Hazard Control and Implementation; and (vii) Performance Evaluation and Feedback. With this model, factors affecting the effectiveness of the SMS were examined with the aim of improving the implementation of the SMS program. It was found that amongst these factors, the inconsistent differences between planning and implementation were linked with safety responsibilities and accountability, competence and training, and availability of OHS standards and requirements.

## Introduction

A study on 24 worldwide OHSMS standards and documents suggests that there is some inconsistency between various safety management approaches. The objective was to identify the critical factors that may affect the planning and implementation of an Occupational Health & Safety Management System (OHSMS). A case study on an international transport utility company (hereafter called the Company) was conducted by means of a questionnaire survey and a series of interviews with the key management persons responsible for the planning and management of the company's OHSMS.

The Seven Guiding Principles developed by the Department of Energy of US was adopted as the framework for the case study. The scope of this study was confined to the management aspects and parameters related to the planning and implementation of OHSMS. It did not include any detail of the safety operation or individual risk elements.

## Concepts and Theories

Quinlan and Bohle (1991) pointed out that the strategy for effective planning and implementation of an OHSMS should include the following:-

- Development and dissemination of the formal OHS policy;
- Clear delineation of the health and safety responsibilities of every member of the organization;
- Development and maintenance of policy-making and advisory channels;
- Generation of data gathering and evaluation of procedures.

According to IOHA (1998), amongst the 24 international OHSMS standards and documents they studied, there was a general weakness in areas often considered central to management-system

approaches, such as management commitment, allocation of resources, continual improvement, integration with other systems and management processes of organization, and management review. Their findings are summarized in Table 1.

Management System Variable	Australia/New Zealand	Australia, SafetyMap	Brazil	EU - EMAS	India	E&P Forum	ISO 14001	ISO TC 67	Ireland	Jamaica	Japan	Korea	The Netherlands	Norway	South Africa, NIOSA	Spain	UK, BS6800	UK, CIA	US, AIHA	US, OSHA	US, VPP	US, 1910.700	US, Cal OSHA
1.0 Management Commitment and Resources	X	X		X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
1.1 Regulatory Compliance and OHSMS Conformance	X	X		X	X		X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
1.2 Accountability, Responsibility, and Authority	X	X		X	X		X	X	X	X	X		X	X		X	X	X	X	X	X	X	X
2.0 Employee Participation	X	X	X		X				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3.0 Occupational Health and Safety Policy	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
4.0 Goals and Objectives	X		X		X	X	X	X	X	X			X	X		X	X	X	X	X	X	X	X
5.0 Performance Measures	X			X	X	X	X	X	X	X			X	X		X	X	X	X	X	X	X	X
6.0 System Planning and Development	X	X	X	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X
6.1 Baseline Evaluation and Hazard/Risk Assessment	X	X	X	X	X	X	X	X	X				X	X	X	X	X	X	X	X	X	X	X
7.0 OHSMS Manual and Procedures	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
8.0 Training System	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8.1 Technical Expertise and Personnel Qualifications	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
9.0 Hazard Control System	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X	X
9.1 Process Design	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9.2 Emergency Response	X	X		X	X	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X
9.3 Hazardous Agent Management	X	X			X	X				X	X	X	X	X	X	X	X	X	X	X	X	X	X
10.0 Preventive and Corrective Actions	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11.0 Procurement and Contractor Selection	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.0 Communication System	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12.1 Document and Record Management System	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.0 Evaluation System	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.1 Auditing and Self-Inspection	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.2 Incident Investigation and Root Cause Analysis	X	X		X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
13.3 Health/Medical Program and Surveillance	X	X			X				X	X	X		X	X		X	X	X	X	X	X	X	X
14.0 Continual Improvement	X			X	X	X	X	X	X	X			X	X		X	X	X	X	X	X	X	X
15.0 Integration	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16.0 Management Review	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

X = variable present  
 Yellow square = variable not present

Table 1 – Summary of Analysis on 24 OHSMS Models By IOHA

In the United States, The Department of Energy developed an Integrated Safety Management System (DOE, 1998), which works around Seven Guiding Principles including:-

- Line management responsibility for safety;
- Clear roles and responsibilities;
- Competence commensurate with responsibility;
- Balanced priorities;
- Identification of standards and requirements;
- Hazard controls tailored to work being performed, and
- Operation authorization;

### Survey and Findings

A structured self-administered questionnaire with both closed ended and open-ended questions was adopted for this survey. The target respondents, which included the Senior Management and personnel of the Line Management, were requested to rate the level of accomplishments of each of the statement that describes the performance area concerned. Additional column of “No Idea” was offered to individuals who did not have any knowledge of the area concerned.

Altogether twenty-one sets of self-administered questionnaires were distributed to the target group. Nineteen questionnaires were returned. The response rate was ninety percent (90%). The findings of questionnaire survey suggest there was a certain degree of inadequacy in the implementation and integration of the various essential OHSMS process elements. Figure 1 summarizes the findings of the questionnaire survey.

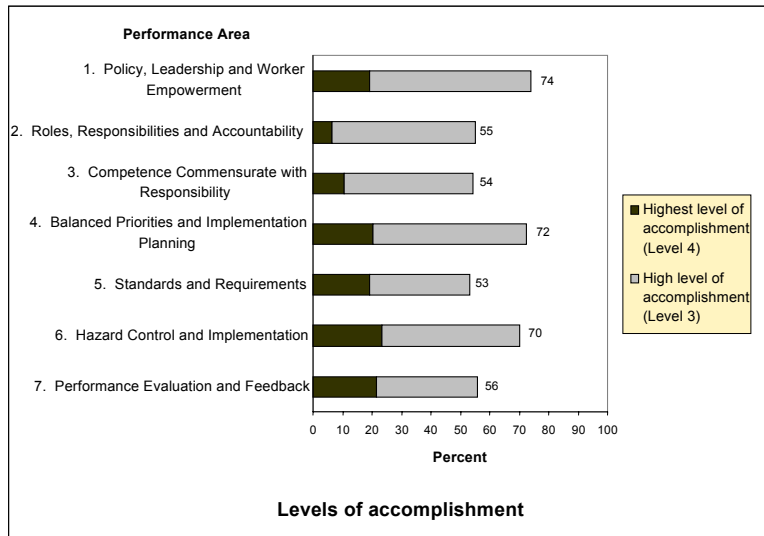


Figure 1 –Summary of Survey Findings

Areas of performance	Percentage of responses					Mean	StD	Mean %	StD %
	Level 4	Level 3	Level 2	Level 1	No Idea				
1. Policy, Leadership & Worker Empowerment	19.2	54.6	16.6	3.3	6.3	60.3	14.4	94.2	22.5
2. Roles, Responsibilities & Accountability	6.5	48.4	20.7	8.4	16.0	57.8	18.7	80.3	26.0
3. Competence Commensurate with Responsibility	10.5	44.0	25.7	7.3	12.6	39.9	12.9	83.1	26.8
4. Balanced Priorities and Implementation Planning	20.4	52.0	14.6	2.4	10.6	77.4	22.9	92.2	27.2
5. Standards and Requirements	19.4	33.8	22.5	7.7	16.7	53.0	18.2	82.8	28.4
6. Hazard Control and Implementation	23.3	47.0	15.4	5.0	9.3	70.2	20.9	92.3	27.5
7. Performance Evaluation & Feedback	21.4	34.3	22.1	3.6	18.6	60.6	23.7	84.1	32.9

Table 2 - Analysis of Findings: Overall Performance

### ***Management Strategy, Policy and Commitment***

It was found that the health surveillance programs and the contractor safety control program of the Company had not been properly set up in the organization. The findings suggest that effective planning and implementation of OHSMS rely very much on a well-formulated OHS policy and management commitment, which serve to provide a clear direction for effective planning and implementation of OHSMS.

It was identified that 4 out of 7 sections were related to OHS management problems, mainly to do with inadequate resources or management support. It was also observed that unclear OHS responsibilities and roles between Line Management and the Safety Section had led to confusion in matters of funding and budgeting. The Company only demonstrated top-management commitment on paper instead of giving OHS its necessary support by actual committing to an appropriate level of resource. Apparently, superficial management commitment without proper funding support cannot put OHSMS into effective operation.

Another essential element that could seriously affect the planning and implementation of OHSMS is the appropriateness of OHS management strategy being adopted by the organization. The Company initially set up its OHSMS on a risk-based approach. Risk-based safety management takes a proactive approach for eliminating and controlling hazards. However it overlooks certain reactive and general safety management elements, like emergency handling and accident investigation. It was noted that the OHSMS of the Company did not address adequately the important issues of accident investigation and root cause analysis in relation to risk management. The study also suggests that risk-based approach cannot be applied effectively for the identification and control of the risk related to occupational diseases which cause long-term ill health because it is difficult to define the likelihood of the risk. Most occupational diseases depend on the length and frequency of exposure as well as the cumulative effects. This deficiency was largely due to the absence of an effective health surveillance program of the Company.

The risk-based safety management approach adopted by the Company was an indoor process and the identified tolerable risks were not required to go through any approval process of the local government. It is so risky that toleration of the identified risk may not be agreeable by the authority as well as the public or the staff. The company could face a serious liability on negligence in duty of care when an accident occurred.

### ***Management Structure and Responsibilities***

Establishment of management structure coupled with clear responsibility and accountability is one of the fundamental elements of management. However, no serious deficiency was observed in this regard. It was found that the Company intended to establish a two-tier approach in their safety management structure to ensure OHS requirements are suitably incorporated into the line management and operations.

Line management participation is vital for the successful implementation of OHSMS. Active participation and enthusiasm of the line management of the Company were demonstrated by the unexpected high response rate of the survey. However, the inconsistency of the OHS plans showed that the safety management structure was not strong enough to support horizontal integration. In certain safety areas, the line management had demonstrated their reservations in taking up their OHS responsibilities. In fact, the most critical issue was the absence of adequate resource. That was why the line management had demonstrated a positive attitude on one hand but, on the other hand, they had been reluctant to take up OHS responsibilities as part of their normal duty. These confusions and deficiencies were caused by the weak management commitment and absence of proper management structure, clear responsibilities and accountabilities.

Besides, staff empowerment is also important for the successful implementation of OHSMS. Staff empowerment may include a 'permit-to-work' system that would empower all level of management/supervisory staff to stop any work, which they feel is unsafe.

### ***Participation, Consultation and Communication***

Staff participation is sometimes affected by consultation and communication. It was observed that majority of line departments rested their OHS responsibilities on only one person and participation

was confined to line management. Senior management did not provided a proper mechanism for dissemination of their safety policy and performance standards while there was little evidence to support that the safety policy and standards were well understood by their staff in the absence of a clear directive on OHS consultation. Furthermore, it was also found that procedures and the OHS manuals of the Company were not readily accessible by all staff. This represented a communication barrier which affects the general effectiveness of planning and implementation.

### ***Training and Technical Competence***

For effective planning and implementation of OHSMS, managerial staff shall be trained up with adequate safety consciousness and competence, especially for senior management, as they are the ones taking the lead to establish a positive safety culture.

During the survey, the safety officers of the Company were found to have a lack of adequate knowledge on the specialized operations. However, the organization establishment was not provided with adequate training reserve to relieve staff to undertake OHS training except on a part-time basis. The deterrent effects of resources constraints on safety training adversely affected the competence of staff in discharging their safety duties and in turn affected the quality of OHSMS management.

### ***Integrated Management and Operations***

It is widely accepted that effective implementation of OHSMS required full integration of the system into both management and operations. The policy of the Company did not support this function. Apparently OHS was treated as a stand-alone adjunct. Communication between divisions/departments was rather weak and there was little evidence to show that the OHS information and requirements were adequately shared or understood by staff. That was why the safety culture of the organization was not strong enough for sustaining continual improvement and supporting effective implementation of OHSMS.

### ***Performance Benchmarking and Objectives***

Performance indicators and standards are considered essential for planning and implementation of OHSMS. Without these indicators and standards, performance targets cannot be established. As observed in Table 1, nine out of twenty-four OHSMS did not include any performance measures as a standard requirement, and seven of them did not address the importance of having a set of well-defined goals.

Failing to set appropriate benchmarks or performance standard was one of the deficiencies identified in the OHSMS of the Company. In the absence of suitable benchmarks or performance standards, it would be difficult to measure the OHS performance of staff. To rectify this problem, OHS performance should become part of the appraisal system. OHS should be regarded as an integral part of the operation instead of a stand-alone function undertaken exclusively by the designated safety personnel.

### ***Best Practice and Safety Culture***

As mentioned before, one of the deficiencies of the Company in implementation of OHSMS was failure in the establishment of a positive safety culture throughout their organization. The negative attitude of line management in promotion of staff participation had a discouraging effect in the establishment of safety culture. Safety culture is concerned with shared values and beliefs that create behavioural norms. Positive safety culture helps promote employee participation and involvement at all levels. A change of paradigm from a compliance approach to a concept of 'best-

practice' and 'continual improvement' should be the long term goal. Coupled with a suitable review/audit system, performance improvements could be ensured.

### ***Planning for Implementation***

It is quite a common problem that certain organizations run "Safety" without "Management". The Company is one of the typical examples. This study has identified that planning is not only required for OHSMS but also needed to establish a structured management approach for its implementation. To ensure effective implementation, an OHS Implementation Plan with the following functions is required:

- To identify the resources needed.
- To set OHS performance objectives and commitments
- To establish work program with appropriate priority, key milestones and schedules.
- To review performance against the previous planned commitments, performance objectives and measures,

The Plan shall be endorsed by the Executive Board or Senior Management to secure proper allocation of resources for implementation. Then the Plan shall be disseminated and made known to all level of staff.

### **Conclusion**

The findings suggest that management commitment, staff accountability and participation, OHS training, setting of clear objectives and performance targets, reviews and evaluations are the major factors that directly affect the effectiveness of planning and implementation of OHSMS. It can be seen that OHS management functions have to be built around the concepts of 'best practice' and 'continual improvement', and the functions include management policy, management commitment, resource allocation, management structure and responsibilities, communication and consultation, staff competence, system integration, performance standards and safety culture. In essence the most important element of success is the provision of an effective implementation plan with well thought out 'action strategies' endorsed by the senior management. And it is important that the Plan and performance requirements are well understood by all level of staff.

In short, for effective planning and implementation, *safety* has to be linked up with *management* to become an integral part of the overall management system with a long term goal of *continual improvement* and adoption of *Best Practices* by all stakeholders.

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