OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS IN CONSTRUCTION ORGANISATIONS

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ABSTRACT
This paper is on the desirability of utilizing occupational health and safety management system (OHSMS) in the delivery of building projects. This was done by reviewing the OHSMS through the understanding of its nature; consequences of its utilization; realizing its assessment system; information system and environmental parameters. It was realized that through its implementation workers will feel secure and comfortable working on construction site; there will be reduction on unnecessary costs in corrective procedures; and avoiding injury or loss of life on sites. The construction stakeholders in addition, will be able to see the benefits arising from the increase in work productivity and ability to meet project deliverables.

Key words: Occupational Health and Safety Management System (OHSMS), Occupational Health and Safety Assessment Series (OHSAS), OHS management information system (OHSMIS), Occupational Safety Environmental Parameter.

INTRODUCTION
Implementing occupational safety and health programs in many construction sites are easier said than done.
In an industry where it is the largest contributor to labour consumption, the construction industry is renowned for its occupational hazards. It is an industry that is more commonly related to risk, hazards and is unsafe. The occupational hazard of the industry relates to the number of high incidences of accidents and fatalities that occur on construction sites. Also, situations, tools, or other elements may be either imminently dangerous referring to an impending or immediate risk such as a bare electrical cord, or inherently dangerous such as poisons, explosives or chemicals. (The Business Roundtable, 1983; Churcher and Alwani-Starr, 1996; Brown, 1996; Rowlinson, 2000; Smallwood and Haupt, 2000).
It is the responsibility of management to provide a safe and conducive working environment where the employees will be able to contribute to the organisational success. For the construction industry, management should place emphasis on finding a management strategy and resolution to reducing the rate of accident occurrence, as well as live saving strategies at the construction site. As a result, there exist legislations to ensure that a workplace is a safe place to be and that is called the Occupational Safety and Health.
Occupational safety and health (OSH) also commonly referred to as occupational health and safety (OHS) or workplace health and safety (WHS) is an area concerned with the safety, health and welfare of people engaged in work or employment. The goals of occupational safety and health programs include fostering a safe and healthy work environment (Fred E., 2003). OSH may also protect co-workers, family members, employers, customers, and many others who might be affected by the workplace environment.

The main focus in occupational health is on three different objectives:

(i) the maintenance and promotion of workers’ health and working capacity;
(ii) the improvement of working environment and work to become conducive to safety and health and
(iii) Development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings.

The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policy, principles for participation, training policies and quality management of the undertaking.

Safety Management System

• “A Safety Management System is an integrated set of work practices, beliefs and procedures for monitoring and improving the safety and health of all aspects of your operation.” (CASA, July 2002).

• “That part of the overall management systems which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the OHS policy, and so managing the risks associated with the business of the organisation.” (AS/NZS 4801, 2001).

• Occupational Health and Safety Assessment Series (OHSAS) was done to facilitate the integration of quality, environmental and occupational health and safety management systems by organizations, should they wish to do so, (Hse.gov.uk. 2012).

Safety and health are of concern to today’s organisations on several levels. These include humanitarian concern, economic cost and benefits, legal and regulatory constraints, liability consequences, and organizational image. All are important, though changes in constraints and attitudes both within and imposed from outside the industry cause some factors to receive more emphasis than others (Barrie D. S., & Poulson B. C. 1992). 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 (Poon S.K., Leung K.T., and Fung K.C).

Therefore this paper which is literature based emphasizes in the desirability of utilizing the occupational health and safety management system (OHSMS) in the delivery of building projects. It intends to do so by:-

- Projecting the nature of OHSMS
- Expanding on occupational health and safety assessment system (OHSAS)
- Reviewing occupational health and safety management information system (OHSMIS)
- Discussing occupational safety and environmental parameters (OSEP)

Nature of Occupational Health and Safety Management System (OHSMS)

Safety management is a concept as articulated elsewhere by Abdulhameed and Sirajo (2014); which has the following objectives in making the environment safe; make the job safe and make the workers safety conscious. In addition, it stresses the importance of a well defined organization structure and the safety planning, concept is seen as having the potentials on eliminating the hazard risks that normally occur on the construction site.

To help lower the risk of work place injuries and fatalities and to avoid costly penalties, a company should develop a documented Operational Health and Safety Management System (OHSMS) for ease of assessment. The Occupational Health and Safety Assessment Series (OHSAS) specifications have been developed in response to customer demand for a recognizable occupational health and safety management system standard against which management systems can be assessed. The series consists of the following standards (Pellicer, E., et al 2014).
• OHSAS 18001 – Occupational Health and Safety Management Systems - Specification
• OHSAS 18002 – Occupational Health and Safety Management Systems - Guidelines for the Implementation of OHSAS 18001
• OHSAS 18001 is compatible with ISO 9001:2008 (Quality) and ISO 14001:2004 (Environmental) management system standards and addresses occupational health and safety rather than product and services safety.

The OHSAS specification provides requirements for an occupational health and safety management system to enable an organization to:
• better manage occupational health and safety risks
• continually improve worker protection
• create a corporate culture that values worker safety as much as production and profit

The series is applicable to any company in any industry that wants to take a pro-active approach to reduce health and safety risks and was designed to help companies develop occupational health and safety policies/objectives and to set performance-based criteria for a managed safety and health system.

The OHS Management System Approach
Together with management’s policy and commitment a good OHS Management System approach tool called the PDCA cycle is used. PDCA(NSAI, 2010), is an ongoing process that enables an organisation to establish, implement and maintain its health and safety policy based on top management leadership and commitment to the safety management system. It consists of the following:
• Plan – establish the objectives and processes necessary to deliver results in accordance with the organisation’s OH&S policy
• Do – implement the process
• Check – monitor and measure performance against OH&S policy, objectives, legal and other requirements, and report results
• Act – take actions to continually improve OH&S performance

The standard can be implemented to your whole organization or to just a part of it. The best results though come when the whole organization is working on the same system and OH&S policy is integrated into other management systems and into the culture of the organization.

Source: National Standard Authority of Ireland (NSAI) 2010.
Plan (NSAI, 2010)
The planning stage of the process requires the organization to:
• Devise an OH&S policy
• Plan for hazard identification, risk assessment and determination of controls
• Identify relevant legal requirements
• Plan for emergencies and responses
• Manage change effectively
• Devise procedures for performance measuring, monitoring and improvement
• Provide and ensure the appropriate use of safety equipment
• Train in order to introduce an OH&S culture and establish the importance of organization’s safety statement, policies and objectives
• Consult employees and communicate

At first, the management has to be consulted in order for them to feel confident in supporting the new system and constantly driving it forward. Then the workforce has to be consulted. It is very likely that the lower level employees have valuable insight, ideas and feedback about the new system. Since they are the ones that are going to be most affected by it, it is logical to ensure they believe and understand the need for change. Failure to realize this could result into much resistance throughout your organization and thus result in a system that is impractical to operate.

Do (NSAI, 2010)
The implementation stage should be the easiest part of this process. If the planning stage is done the right way then it is just a matter of following the documentation and procedures that have been created. In order to ensure smooth implementation a lead senior manager should be in charge of the new OH&S system and at the same time each element of the process should have an ‘owner’ or a person that looks after that part of the system. This ensures the appropriate structure at your organization and effectively minimizes risk.

It is advisable to start the implementation by breaking the system down into specific elements rather than tackling it as a whole. Concentrating on specific elements in a logical order creates a solid foundation for the whole system to work efficiently.

Another important aspect of health and safety is having employees do the jobs that are suited to their competencies. A matrix should be created showing all groups of personnel, their required competencies, training and status of each. These formal procedures should instill the required awareness within your organization.

Understanding the Detail

Check (NSAI, 2010)
The third step of the PDCA cycle consists of the following:
• Conducting internal audits
• Evaluation of legal compliance
• Identifying non-conformities and addressing them
• Thorough analysis of incidents and incidental data
• Measuring performance and monitoring

The failure to conduct internal audits periodically will most likely result in the breakdown of the system as a whole. It often happens that where there is no control, risks tend to arise especially quickly.

Any arising non-conformities should be tackled instantly using the devised corrective actions. The most effective and robust systems ensure that this process runs smoothly at all times. This means that the performance of this process should be measured as well and any non-conformity has to be dealt with.
It is not only the arising non-conformities that your organization needs to think about. It’s crucial for your organization to identify any possible emergencies and develop relevant response procedures, this is called preventative action. When devising controls and measuring performance it is important to strike a balance between being overly bureaucratic and overly light on certain elements of the system. The OHSAS 18001 Occupational Health and Safety Management Specification is not supposed to hinder the performance of your organization but improve it.

**Act (NSAI, 2010)**

The final step is the management review, it is a vital part of the continuous improvement process and so the standard itself outlines what should be included in such a review. Management review is done by the senior management and involves reviewing the suitability, adequacy and effectiveness of the system. It should also include assessing opportunities for improvement and the necessity to change the OH&S policy and the OH&S objectives. If changes are needed, the senior management should also provide the necessary resources for their implementation. Providing resources is a way of presenting commitment to the new health and safety system.

**Benefits of an Effective Health and Safety Management System (SRI, 2010)**

- improving management commitment and employee involvement
- providing ways to measure the effectiveness of a health and safety program
- improving worker protection by eliminating serious hazards
- reducing worker risk of death, injury and illness on the job
- Reducing workers’ compensation rates and other costs, lowering absenteeism, and increasing productivity and morale
- Reducing damage to company property and costs associated with idle periods
- helping keep turnover down and attract new employees
- Stimulating employees to continually improve systems
- improving relationship with OSHA

**OCCUPATIONAL HEALTH AND SAFETY ASSESSMENT SERIES (OHSAS)**

OHSAS 18001:2007 and accompanying OHSAS 18002, Guidelines for the implementation of OHSAS 18001, have been developed in response to customer demand for a recognizable occupational health and safety management system standard against which their management system can be assessed and verified (NSAI, 2010). Organizations which have attained registration through NSAI maintain that it leads to improved internal and external communications and a more disciplined attitude among employees to health and safety matters through continuous improvement. OHSAS ensures a consistency of approach, which assures compliance as a minimum.

OHSAS 18001 has been developed to be compatible with ISO 9001:2008 (Quality) and ISO 14001:2004 (Environmental) management systems standards, in order to facilitate the integration of quality, environmental and occupational health and safety management systems by organisations, should they wish to do so.

Organisations of all kinds are increasingly concerned with achieving and demonstrating sound occupational health and safety (OH&S) performance by controlling their OH&S risks, consistent with their policy and objectives. They do so in the context of increasingly stringent legislation, the development of policies and other measures that foster good OH&S practices.

**Fundamental Elements of OHSAS 18001**

Occupational Health and Safety is based on (NSAI, 2010).
• Hazard identification
  The process of recognizing that a hazard exists (source or situation with the potential to cause harm in terms of human injury or ill-health)

• Risk assessment
  The process of evaluating the risk arising from the hazard (combination of the likelihood of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event of exposure)

• Determination of applicable controls
  Measures relevant to eliminate or reduce risk to an acceptable level. Measures are based on the hierarchy of control measures.

Advantages of an Effective OHSAS Management System (NSAI, 2010)
• Provides a structured approach for managing OH&S
• Establishes and maintains a commitment to occupational health and safety
• Demonstrates strong commitment to safety excellence
• Organisational structures in place with clear roles and responsibilities
• Existence of a continuous improvement culture
• Strong levels of trust and communication
• Reduction in incident levels with increased measures of performance.
• Contributes to business performance by reducing cost and liabilities.

DEVELOPMENT AND IMPLEMENTATION OF APPROPRIATE OHS MANAGEMENT INFORMATION SYSTEMS (OHSMIS)
Risk Management processes is cyclical in nature and the activities should be treated as ongoing. In this sense, risk management is a method of continuous improvement in the decision making process and facilitates continuous improvement in OHS performance. The management of OHS information makes good business sense. Regular monitoring of OHS issues can indicate injury trends or recurring hazards in the organisation. This information can form the basis of a prevention program specifically targeting these areas of concern.

The Benefits of an OHS Management Information System
A good management information system can; (Work Safe BC, 2005)
• indicate injury or illness trends within the agency, which gives management the opportunity to institute prevention action specifically targeted at these trends;
• allow management to target specific areas of concern within the agency;
• ensure agency compliance with legislative reporting requirements; and
• help organisations demonstrate due diligence.

How an OHS Management Information System is Developed and Maintained
Some aspects to consider are (Work Safe BC, 2005)
• review the current Management Information System, and ascertain whether required OHS information can be obtained from it
• design specific recording and reporting tools that will collect necessary data for analysis;
• ensure data collected will make a positive contribution to continuous OHS improvement;
• ensure data gathering provides for easy identification of any issues, or problem areas, within the agency;
• ensure compulsory investigation of all incidents and recording of the results, including review of all investigations and risk assessments;
- ensure auditing of the OHS Management Information System is a scheduled management activity;
- monitor data on a regular basis; and
- utilise external sources to add value to your agency OHS Management Information

### Utilisation of OHS MIS

The following flowchart illustrates the process for utilising Management Information System to achieve a desired OHS outcome, whether it be provision of information for an agency’s annual report, or more importantly, provision of a safe workplace for employees.

![Flowchart Illustrating OHS MIS Utilisation](image)

**Source:** The Principle of Effective OHS Risk Management, (2005) OHS Risk Management

In order to achieve an effective health and safety system it is vital for organizations to handle these with greater significance. The three aspects above provide the ever important foundation for implementing OHSAS 18001 and without them; the overall system would surely fail. They are, theoretically, considered a part of the ‘PLAN’ step, but most auditors and consultants agree that these aspects should be dealt with before designing the system as a whole.

### OCCUPATIONAL SAFETY AND ENVIRONMENTAL PARAMETERS

Industry professionals as well as academics have noted that regulations and legislation by themselves are not enough to bring about a desired goal of zero accidents and incidents on construction sites. Though regulations and legislation are not enough to ensure guaranteed safety but by adhering to these regulation and policies, it does improve site safety. With regards to cost, it is minimal as this can improves construction safety at minimal or no extra cost. However, without proper codes and standard, the results can be the absolute reverse. Increased costs and disputes can arise from delays in construction progress, penalties for these delays, financial losses, personal injuries and fatalities. Regardless of the strictly enforced safety and health
regulations in most countries, high rates of injury and fatality do persist (Center to Protect Workers’ Rights1993; Ratay1997).

It is widely accepted that the construction industry is a significant driver for a country’s economy. This is due to its labor-intensive activities and operations (Haupt 1996).

Responsibilities of Management Regarding the Implementation of Safety and Health in an Organisation

Responsibility for safety and health management ultimately rests with the employer. This responsibility is normally delegated to executive directors, senior managers, line managers, supervisors and employees. Each person’s authority and duties should be clearly defined, documented and communicated to them. The organisational and reporting structure for implementing these duties should be illustrated in an in-house organisational chart. In addition each director on the organisation’s board needs to accept their responsibilities in providing safety and health commitment and leadership by: (Health & Safety Authority 2015).

- ensuring that each members’ actions and decisions at board level always reinforce the message in the organisation’s Safety Statement.
- preventing a mismatch between individual board members attitudes, behaviour or decisions and the organisation’s Safety Statement so as not to undermine workers belief in maintaining good safety and health standards.

Human Factors that Affect Health and Safety Performance

Accidents, ill health and incidents are seldom random events. They generally arise from failures of control and involve multiple contributory elements. The immediate cause may be a human or technical failure, but such events usually arise from organisational failings, which are the responsibility of management. Successful safety and health management systems aim to utilise the strengths of managers and other employees. The organisation needs to understand how human factors affect safety and health performance. Senior executive directors or other senior management controlling body members and executive senior managers are primarily responsible for safety and health management in the organisation. These people need to ensure that all their decisions reflect their safety and health intentions, as articulated in the Safety Statement, which should cover: (Health & Safety Authority 2015).

- the appointment of someone at senior management level with executive responsibility, accountability and authority for the development, implementation, periodic review and evaluation of their safety and health management system
- the safety and health ramifications of investment in new plant, premises, processes or products. For example such changes could introduce:
  - new materials - are they toxic or flammable, do they pose new risks to employees, neighbours or the public and how will any new risks be controlled?
  - new work practices - what are the new risks and are managers and supervisors competent to induct workers in the new practices?
  - new people - do they need safety and health training and are they sufficiently competent to do the job safely?
  - only engaging contractors to do new or ongoing projects that reinforce rather than damage the organisation’s safety and health policies
  - recognising their continuing responsibility for safety and health even when work is contracted out
  - providing their customers with the necessary safety and health precautions when supplying them with articles, substances or services
being aware that although safety and health responsibilities can and should be delegated, legal responsibility for safety and health still rests with the employer.

Senior Manager’s Responsibilities Include (Health & Safety Authority 2015).

- preparing safety and health policies and consulting employees, including the safety committee where it exists, and the safety representative, as appropriate
- devising safety and health strategies for key high risks
- setting safety and health objectives and targets for employees
- devising plans to implement the safety and health policy
- ensuring that appropriate organisational structures are in place
- identifying and allocating resources for safety and health
- ensuring that the safety and health policy is effectively implemented and checking whether objectives and targets have been met
- reviewing the effectiveness of the safety and health management system
- implementing any necessary improvements derived from carrying out Risk Assessments
- giving all personnel the authority necessary to carry out individual safety and health responsibilities
- devising appropriate arrangements whereby employees are held accountable for discharging their responsibilities
- establishing clear and unambiguous reporting relationships
- devising job descriptions that include safety and health responsibilities
- incorporating safety and health performance in the appraisal system where personal appraisal systems exist
- Developing safety and health cultures in project teams and team working situations.

CONCLUSION

Despite the importance of the construction industry to a nation’s economy, occupational health and safety should not be ignored. Having an efficient occupational safety and health programs, workers would feel secure and comfortable working on the construction site (Khalid 1996). A safe and healthy environment at the workplace would mean the reduction in unnecessary costs in corrective procedures by focusing on preventive measures thereby not only increasing productivity of work but also avoiding any injury or loss of life. It is necessary for all construction companies to provide a safe and conducive working environment for their workers and subcontractors at construction and fabrication sites. With the introduction of legislation to protect the common worker at the construction workplace, occupational health and safety would gain an important attention from the employers for fear of possible prosecution for non-compliance. As Ahmad et al (2002), concurred, “With good safety and health programs in the construction workplace, the construction project stakeholders will be able to see the benefit arising from the increase in work productivity, reduction in unnecessary costs as well as being able to meet the project deliverables”.

OHS Management system not only identify all hazards and risks to be managed, but provide guidelines for how they are to be managed, who is responsible for implementing actions, what resources are required to properly implement the plans. They also identify the monitoring and review requirements necessary to keep the system effective and appropriate.

RECCOMENDATIONS

- Governments should ensure the construction bill is passed into law to enhance the practice and enforcement of health and safety practice in the built environment.
o Government should establish a body in Nigeria to responsible for the practice of health and safety in the built environment.
o Standard organisation of Nigeria should ensure that standards for the practice of health and safety in the built environment are available and complied with.
o Standard organisation of Nigeria should mount vigorous campaign on the practice of health and safety management system by the construction industry.
o Profession and regulatory bodies in the construction industry should mount on a continuing basis capacity development programmes for their membership in the area of health and safety management system and ensure that they practice it at all the times at their working places.
o Professionals in the construction industry should imbibe the culture of health and safety management system at their working places and convince their organizations on the need to practice OHSMS.
o Companies in the construction industry should practice OHSMS in their organizations so as to drive the benefits there from.

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