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OCCUPATIONAL SAFETY AND HEALTH (OSH) MANAGEMENT SYSTEMS: TOWARDS DEVELOPMENT OF SAFETY AND HEALTH CULTURE

Ahmadon Bakri, Rosli Mohd Zin, Mohd Saidin Misnan & Abdul Hakim Mohammed
Universiti Teknologi Malaysia, 81310 UTM Skudai, Malaysia
Email: ahmadon@utm.my

ABSTRACT: The unsatisfactory OSH record of the construction industry has always been highlighted. It is because the OSH management system is a neglected area and a function that has not been pursued systematically in the construction industry. Safety is an important issue, but many employers do not feel it is vital to the success of companies. For a long time, the construction industry has been labeled as with poor OSH culture and performance. But a mature construction company is still able to perform well in safety area. This type of company usually set their OSH goals for the continuous improvement in overall. Understanding the concept of the OSH management system will help us to understand the application of OSH management system in Malaysia and legislation needs to follow by industry. The rules and legislation are always protecting the worker safety and ensuring healthy workplaces. The main purpose of the rules and legislation is to prevent accidents, ill health and injury at workplaces. This paper will discuss theoritical review on OSH management in construction industry towards development of safety culture.

Keywords *:* Construction Industry, OSH Management System, Safety and Health Culture.

1.0 Introduction

Construction industry has earned the reputation of being a highly hazardous industry because of the high incidence of accidents and fatality rates. It is needed to look into a new way in improving its image. One key to success in business is minimizing cost. Providing a safe and health workplace is one of the most effective strategies for holding down the cost of doing construction business. Accidents frequencies and property losses create great impact to construction company. Not only do they cause delays in operations but also directly and indirectly incur cost. Therefore, it is mandatory for all construction companies to provide a safe working environment for their workers and subcontractors.

Occupational Safety and Health (OSH) at work is an issue affecting all businesses. OSH is a major issue for companies mainly due to the fear of prosecution. With better enforcement of the legislation and commitment from employers and employees, construction safety has received greater attention (R.Kunju *et al*, 1999). Consequently, the improvement of safety and health in construction is a necessary goal for all participants in the construction process. Besides that, safer workplaces will help to improve productivity accompanied by reduced costs, better time performance and increased profitability.

1.1 Problems Statement

The construction industry is an important sector of any national economy, especially regarding its employment potential. But accidents, incidents, injuries and fatalities continue to occur unabated on construction sites around the world at consistently high rates (Hinze,

1997). The construction industry tends to have a low awareness of the long-term benefits of safety practices, while the tendering process often gives little attention to safety, resulting in cost and corner cutting (Biggs et al, 2005). Sometimes, safety is found to be the first item to face cost cutting. This is because some of the employers often believe that the implementation of OSH management system will cost more.

The unsatisfactory OSH record of the construction industry has always been highlighted. It is because the OSH management system is a neglected area and a function that has not been pursued systematically in the construction industry. Safety is an important issue, but many employers do not feel it is vital to the success of companies. According to Radhlinah (2000), the construction industry can benefit from an improved attitude change that cultivates a vision for the future which elevates safety concerns and effectively integrates them into the overall management mix. High rates of injury are primarily due to inadequate or non-existence of an OSH management system. Many occupational accidents and injuries are due to a breakdown in the existing OSH management system. Therefore, the application of an 'effective' management can lead to safer systems of construction and reduce incidence of injuries and work related diseases (Davies and Tomasin, 1996).

1.2 Objectives

The objective of this paper is to discuss theoritical review on OSH management in construction industry towards development of safety culture.

2.0 NATURE OF THE CONSTRUCTION INDUSTRY

Occupational safety and health (OSH) is being highlighted as a major issue to the construction industry. It ensures company compliance with all current health and safety legislation in relation to design, construction and facilities management. The state of the construction industry in a country is symptomatic of its national economy. In other words, the fate of any national economy cannot be separated from the construction industry. This is a consequence of the forward and backward linkages the construction sector forges with the rest of the economy (Ahmad and Yan, 1996). The backward linkages refer to the construction materials and services sectors of the economy. The forward linkages refer to the economic activities that resulted from the use of constructed buildings and facilities.

Each building site represents the effect on the creation of a production site where new workplaces are set up. The term of 'mobile factories' are used to describe this phenomenon. At the end of each construction project, the 'factory' is disassembled and relocated to the site of a new or different project. However, the conditions at the new site might be completely different from the previous project site. The changing working environment results in potentially hazardous situations. Construction workers are required to familiarize themselves constantly with these new situations. Unlike manufacturing, continuity of production is not always possible, since each product of construction is usually unique.

Additionally, the composition of construction project teams is responsible for the design, project management and project execution, resulting in a lack of continuity and consistency. Traditionally, design is separated from the actual construction process with resultant problems in communication, coordination and interpretation. Significant professional, legal and institutional barriers have accompanied this separation, which has created continuity problems and disputes between the various participants of the project team, constructors and subcontractors. For a long time, the construction industry has been labeled with a poor occupational safety and health culture. Efforts to improve occupational safety and health performance will not be effective until the occupational safety and health culture is improved (Gadd and Collins, 2002). As the result, there is a need for a major paradigm shift regarding attitudes occupational safety and health on construction sites.

2.1 Why Safety and Health Should Be Well Managed?

The reasons why health and safety should be well managed fall under the three main following headings (Bateman, King and Lewis, 1994): humanitarian, financial, and legal.

a) Humanitarian Consideration

A lot of people are killed in workplace accidents or suffer major injuries due to occupational illness. Beside this, there are still a number of uncountable people who suffer from long term health problems due to their work. The economic costs are considered later but it is clear that this scale of human suffering should be acceptable in an advanced, civilized society. Fortunately, the picture is improving, partly due to gradual raising of health and safety standards. However, the contraction of the country's manufacturing and industrial base has also played a part.

b) Financial Costs

The financial costs of accidents serve as the second reason of the implementation of effective management of health and safety. Some of these costs are potentially measurable whilst others are hidden. Measurable costs refer to the compensation paid to employees in the form of damages and are sometimes the related legal and administrative costs. Although these payment paid are made by the insurance company, in the long run the insurance premium paid will inevitably reflect the claims history of the employer.

So, senior managers or safety specialists may be unaware of the size of the premium being paid. While the hidden costs of accidents are either impossible to quantify or their quantification would be totally impracticable. However, the hidden costs are usually far greater than the measurable costs, especially when the large numbers of minor injuries and non-injury accidents are taken into account.

c) Legal Sanction

Occupational safety and health is under the legislation, in terms of general or specific application. Much of it can give rise to claims for damages, but all could result in action by the relevant enforcing authority. Often the most damaging effect of legal sanctions can be on the organization's own image of itself. Legal fees also often match or even exceed the normal size of fines meted out.

2.2 OSH Management System of the Construction Industry

Health and safety risks are needed to identify, assess, and take certain action to eliminate or minimize the probability of occurrence. In order to reduce the accident or incident level and subsequently cut losses, it is important to ensure that safe working practice is being observed (Radhlinah, 2000). Safe operation and accident prevention form a good business practice. OSH management system (OSHMS) in the context of construction is the discipline of preserving the health of those who build, operate, maintain and demolish engineering works and of others affected by those works. It is also primarily designed to protect the health and safety of individual workers or members of the public. Traditionally, the responsibility of safety falls on the individual.

The implementation of OSHMS by the main parties involved in the construction process (owners, designers, supervising companies, contractors) must also require adaptations. We need to take the perspective and the contribution of each of these parties to the OSH into account. The implementation of the OSHMS must be applicable to all levels of organizations.

It must conform to the existing laws and regulations related with safety and health at the workplace.

Hinze (1997) claimed that managing safety essentially involves four levels: the company policy level, project management level, site management level, and individual level. Failure at each level is the reason for the occurrence of accidents. Failure at the first level will increase the probability of failures at the second level and so on. Improper OSH management leads to poor safety records. It is hard to achieve the aim of 'zero accident' due to the rough and tough nature of the industry. Overall, OSHMS mainly rely on continual monitoring of indicators of performance of the relevant processes, and continuous improvements in these processes.

In the industrialized nations of the world, accidents now cause more deaths than all infects diseases and more than any single illness except those related to heart disease and cancer (Biggs *et al*, 2005). Safety should be a major concern in any industry. In the construction industry, the need for such concern may be greater than in most other industries. This is caused by the disproportionately high number of industrial injuries incurred by construction workers.

Table 1.0 Number of fatalities and death rate from 2000 – 2004

INDUSTRIAL CATEGORIES /YEAR	**NUMBER OF FATALITIES AND DEATH RATE**				
	2000	**2001**	**2002**	**2003**	**2004**
1. Agriculture, Forestry & Fishery	115	75	69	40	62
2. Mining & Quarry	11	7	12	8	8
3. Manufacturing	282	243	214	213	195
4. Electrical, Gas , Water & Cleaning	8	13	14	8	10
5. Construction	***159***	***89***	***88***	***95***	***77***
6. Trade	151	192	134	151	143
7. Transportation	98	91	90	108	73
8. Finance & Insurance Institution	11	6	9	7	5
9. Services	72	106	87	84	65
10. Public Services	97	136	141	108	131
TOTAL	**1,004**	**958**	**858**	**822**	**846**

Source : Social Security Organization (SOCSO) 2005

Table 1.0 shows that the number of fatalities and death rate have declined from 2000 – 2004. The statistics are reported by the Social Security Organization (SOCSO). SOCSO collected data on accident rates within industrial categories. The fatality rate in the construction industry is very high in year 2000, the total number is 159. That is the second highest ranking of the death report between the 10 industries. But the statistic had dropped about 50% since 2001 until now. The statistics of fatality rate between years 2001 to 2004 had changed slightly form year to year. The statistics have remained reasonably constant over the past several years. The fatality rate of construction industry is dropping recently. The lowest fatality was achieved in year 2004, whereby there are only 77 cases. This is a good phenomenon for the construction industry.

Comparisons have been made between the construction industry and other industrial sectors. Along these years, the highest injuries rates usually come from agriculture, forestry & fishing industry, manufacturing industry and trading industry. Although construction industry is not the highest injuries rates among those industries, but its fatality rate is still considered as high. This condition has become better and better, when the fatality rate has been reduced to nearly 50%. But it is still not the lowest level of incidence of injuries and fatality that we expect. The goals of the construction industry should be to achieve 'zero accident'. And it still has a long way to achieve this aim.

What are the features of construction that make so many workers injured and killed? This is probably because the demand for worker with the appropriate construction skills has fluctuated. Qualified and trained workers, that need some kind of employment, leave the industry when the demand for their services disappears. The impact of this occurrence is evident in the lack of investment and lack of commitment in worker training. Training is an important component of any plan to improve safety performance (Cox and Tom, 1996).

Once construction activity increases, the shortage of skilled and trained worker is even more acute. To make up for this shortage, the labor force may be augmented with or even consist of workers who lack the appropriate training and experience needed to properly and safely execute the essential processes of construction assembly. These workers are usually expected to acquire totally new skills on the actual job site but without any structured instruction or training program (Biggs *et al*, 2005). Usually a proper induction program that has been shown to be effective in safety and health program is not conducted for these new employees. These workers constitute the group that is most likely to be involved in accidents (Hinze, 1997).

3.0 OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEM

Occupational safety and health (OSH) is an interdisciplinary field which encompasses among others, the disciplines of industrial hygiene, occupational medicine, occupational nursing, engineering, epidemiology, and toxicology (Levitt and Samelson, 1993). It includes the surroundings and conditions that affect employees and other related persons at workplace. Although working environment has improved considerably during recent decades, but occupational accidents still occur. The prevention of work related injuries still remained as a major problem faced by all types of organization. OSH management system (OSHMS) is an integral part of the overall management system of the organization. It facilitates the management of the OSH risks associated with the business of the organization.

3.1 Safety and Health Culture

Safety and health culture within a company is closely linked to the workforce's attitudes in respect to safety. They share the company's risk, accidents and incidents. According to Glendon and McKenna (1995), effective safety management is both functional (involving management control, monitoring, executive and communication sub-systems) and humanizes (involving leadership, political and safety culture sub-systems paramount to safety culture). The role of management and the involvement of all employees as important key players in safety and health culture are important in order to cultivate the positive beliefs, practices, norms and attitudes among all in the company.

Building a safety culture on so many diversities is not an easy task. But it had been proven that companies with good safety and health cultures have employees with positive patterns of attitude towards safety and health practices. Companies need to gather safety-related information, measure safety performance and bring people together to learn how to work more safely. Glendon and McKenna (1995); Caborn (2005) also identified four critical indicators of safety culture. They are:

a) Effective communication, it leads to commonly understood goals and means to achieve them at all levels.
b) Good organizational learning, whereby organizations are able to identify and respond appropriately to changes.

c) Organizational focus upon health and safety, how much time and attention is essentially paid to health and safety.
d) External factors, including the financial health of the organization, the prevailing economic climate and impact of regulation and how well these are managed.

3.2 Occupational Health and Safety Management System (OHSMS)

The South Australian Safety Achiever Bonus Scheme defines an OHSMS as an 'orderly arrangement of interdependent activities and related procedures that drives an organization's OHS performance'. Broadly, an OHSMS is a planned, documented and verifiable method of managing hazards and associated risks (Bryan, 1999). It is can also be defined as the plan to reduce and eliminate hazards and risks at workplace.

According to OHSAS 18002:2000, OSH means the conditions or factors that affect the well being of employees, temporary workers, contractor personnel, visitors and any other person at the workplace. OHSMS is a part of the overall management system that facilitates the management of the OSH risks that are associated with the business of the organization. This includes the organization structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the organization's OSH policy. Within these definitions it is possible to contrast systematic approaches with reactive workplace health and safety cultures (Table 2.0).

Table 2.0: Contrast systematic approaches with reactive workplace health and safety culture

Reactive workplace health and safety culture	Systematic approach
Hazards are dealt with reactively.	Hazards are identified.
Risk controls are dependent on individuals.	Risk controls are described in procedures.
Risk controls are not linked.	Risk controls are linked by a common method.
OHS activity happens but is not planned.	OHS activity is planned.
Controls are reviewed after an incident.	Controls are monitored and reviewed regularly.
Responsibilities are not defined.	Company policy is communicated.
Focus on own backyard only.	Public and supplier risks managed in planned way.

Source: OHSMS: Strategic Issues Report (1999)

3.3 OSH Management System in Malaysia

Malaysia put a special emphasis on OSH issues due to its speed of economic development. There is a growing concern about safety and health at work. Until 1994, Malaysia still did not have adequate provisions to sure safety and health of employees at the workplace. They were merely the traditional approach legislation meant for technical aspects and lacked the human aspects of ensuring safety and health at workplaces.

Thus, the promulgation of the Occupational Safety and Health Act 1994 has made further provisions for securing the safety, health and welfare of any connection with the activities of the person at work. It is based on the concept of self-regulation whereby the Act places certain duties on employers, employees, self-employed persons, manufacturers, designers and suppliers. It also places emphasis on the prevention of accidents, ill health and injury. This is the main Act which we hope can help to reduce occupational incidents and accidents in the Malaysia.

OSH management system is a combination of the management organizational arrangements, including planning and review, the consultative arrangements, and the specific program elements that are combined to improve health and safety performance (Biggs *et al*, 2005). Realizing the importance of OSH management in the organization, many organizations are adopting the internationally recognized safety system standards and guidelines. One such standard is the OHSAS 18001. The official introduction of OHSAS 18001 standard by SIRIM QAS, which forms a basis of the OSH management system, is timely (Nimi, 2002).

The OSH management system is based on the nature of OSH legislation. It does encourage the organizations to use a systematic OSH management approach. Apart from fulfilling the general legal duties under the Occupational Safety and Health Act 1994 requirements, organizations that adopt the OSH management system will gain a lot of benefits such as prevent accidents happen, improve productivity, reduce unnecessary losses and so on.

3.4 Occupational Safety and Health Act 1994 (Act 514)

The Occupational Safety and Health Act (hereinafter referred to as "OSHA" or the "Act") came into force on 25th February 1994. It is an Act to make further provisions for securing the safety, health and welfare of person at work. It protects others against risks to safety or health in connection with the activities of persons at work. Act 514 is an enabling Act which is superimposed over existing safety and health legislation such as the Factories and Machinery Act 1967 (Act 139). Regulations would normally be formulated on the basis of proposals submitted by the National Council for Occupational Safety and Health or the Director General of Occupational Safety and Health after consultation with tripartite organization.

Act 514 provides the promotion, co-ordination, administration and enforcement for occupational safety and health. The Act places certain duties on employers, employees, self-employed persons, manufacturers, designers and suppliers. It also places emphasis on the prevention of accidents, ill health and injury. The long term goal of the Act is to create a healthy and safe working culture among all Malaysian employees and employers. Regulations have the effect on detailing the specific requirements of the legislation. Regulations may prescribe minimum standards or have a general application or they may define specific requirements related to a particular hazard or particular type of work. Section 66 of the Act outlines the range of possible regulations.

3.5 Benefits of OSH Management System

Organizations devote considerable resources in protecting worker safety and ensuring healthy workplaces. For both business and financial reasons, many go beyond the minimum requirements set by occupational health and safety laws. OSH management system provides companies with the framework to develop a solution to the increasing challenges facing them at the workplace today, from high injury and illness, lost work days, increasing occupational health and safety regulations, large citations/ penalties, rising worker's compensation costs, costly medical claims, worker retention and employee satisfaction (David, 2003).

Traditionally, OSH management was a reactionary process with companies acting only on work related incidents after they had occurred rather than implementing the means to control work related risks. Many companies who have implemented OSH management system have reported benefited from increased operational efficiencies, reduction in lost workdays, fewer accidents and medical claims, recognition by insurers and regulators and improved worker's retention and satisfaction. Organizations with effective OSH management system earn positive returns and benefits on their health and safety investment by:

a. Operational cost savings through OSH management system.
b. Reducing work-related accidents and ill health and the costs associated with them.

c. Improving performance through heightened employee morale and adherence to policies and procedures.
d. Increased control of regulator issue.
e. Reinforcing a responsible and well-managed reputation with customers, stakeholders and communities.
f. Clear demonstration of legal and regulatory compliance to regulatory authorities, customers and employees.
g. Better management of health and safety risks on a planned and ongoing basis.
h. Increased access to new customers and business partners through an improved corporate image.

3.6 Elements of the OHS Management System

The elements of the OHS management system specified under the BS 8800 are as follows (Table 2.0):

a. Policy : Requirements of the safety and health policy reflect the management commitment towards the organization's safety and health.
b. Organizing : Organizing is the process of allocating the responsibilities and the necessary arrangements to be taken. HSE (1991) describe the four C's of organizing as control, cooperation, communication and competence. Organizing also outlines the needs for proper OHS documentation.
c. Planning and Implementing : Organizations adopt a planned and systematic approach to policy implementation. This includes the management arrangement such as resources, personnel, contingency plans, organization activities, measuring performance, audits, status review, and corrective measures.
d. Measuring Performance : This element describes the method of monitoring and measuring the OSH performance. It describes the purpose and the types of monitoring. For example, there are proactive monitoring and reactive monitoring.
e. Audit : This element describes the procedure of planning and managing the audit. An OSH audit is far more comprehensive than the measurement of a simple parameter or a routine safety inspection. It can be carried out by someone within the organization or an outsider. A combination of these two is often particular effective.
f. Initial and Periodic Status Review : The initial status review will provide information on the current system. This will enable decision to be made on its scope, adequacy and implementation. It will also act as a baseline for the progress that can be measured. While the periodic status review will determine the outcome of the systems implemented and identify the necessary cause of action to be taken to improve any deficiencies.

4.0 Summary

Understanding the concept of the OSH management system will help us to understand the application of OSH management system in Malaysia and legislation needs to follow by industry. The rules and legislation are always protecting the worker safety and ensuring healthy workplaces. The main purpose of the rules and legislation is to prevent accidents, ill health and injury at workplaces towards development of safety culture. Many companies who have implemented OSH management system have reported benefited from increased operational efficiencies, reduction in lost workdays, fewer accidents and medical claims, recognition by insurers and regulators and improved worker's retention and satisfaction. Organizations with effective OSH management system earn positive returns and benefits on their health and safety investment

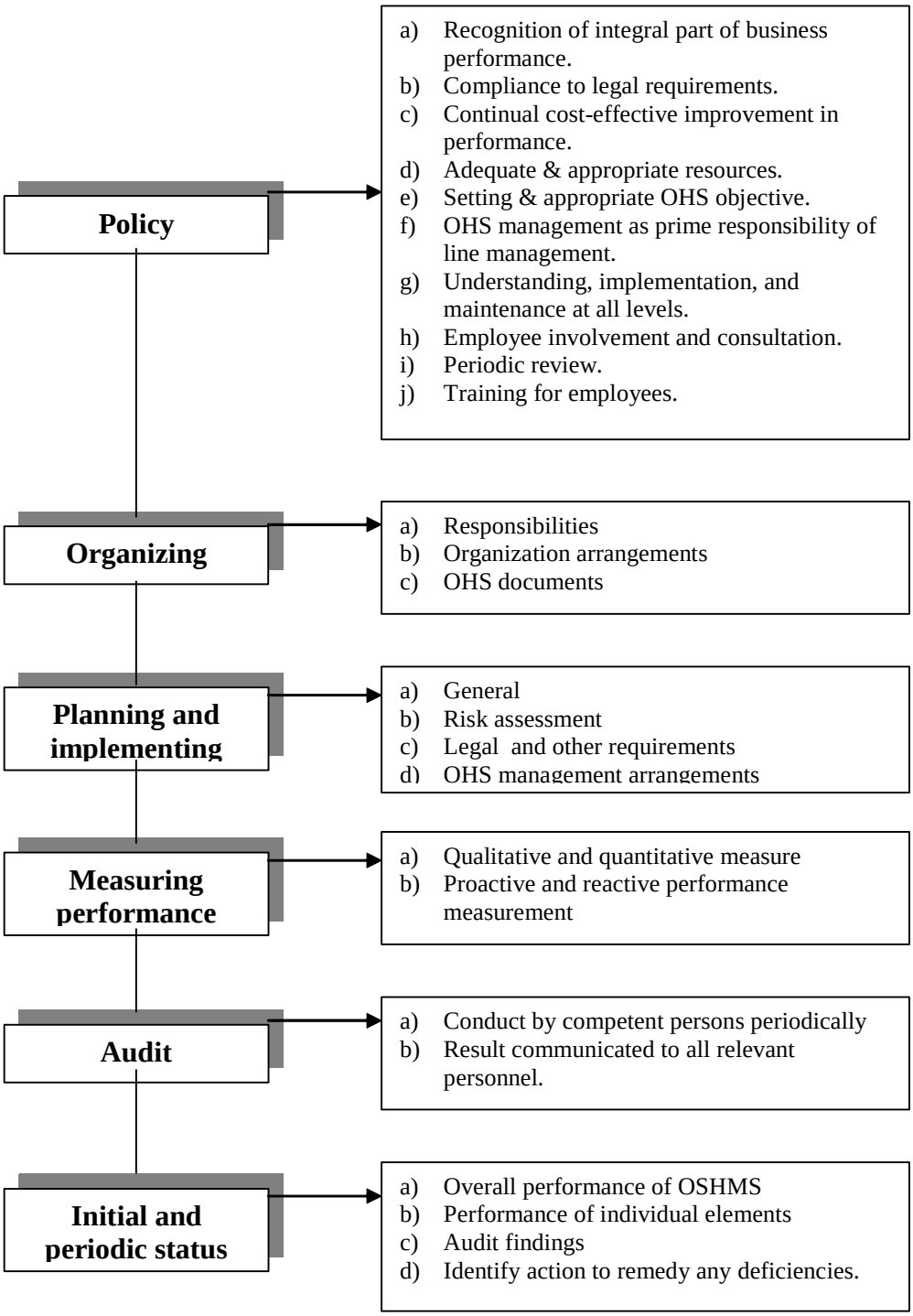

Figure 1.0: *OHS management system elements of the BS 8800: 1996*

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