

# DEVELOPMENT OF SAFETY CULTURE IN THE CONSTRUCTION INDUSTRY: A CONCEPTUAL FRAMEWORK

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The nature of most accidents at the construction sites shows that the construction industry is unique. Factor involved include human behaviour, different construction sites, the difficulties of works, unsafe safety culture, dangerous machinery and equipment being used, and non-compliance to the various set procedures. Study shows that an accident and injury at the worksite is often the result of workers' behaviour, work practices or behaviour and work culture. Safety and health culture are more related to workers' safety practices. An efficient safety management system ought to be based on the safety awareness that should become a culture in the construction industry involving all the parties. The efficient safety culture and safety management system should be shown to the public, and as well as healthy and safety in environmental value business. This paper will discuss the conceptual framework of the development of safety culture in the construction industry, known as one of the dangerous industries but which can still provide a safe working environment thus offering a safe and promising career. Safety culture is an alternative for encouraging competition at any level. The construction industry must have a safety culture in order to reduce number of accidents, fatalities and injuries that involves workers and properties.

Keywords: behaviour, safety, safety culture, work practices.

## INTRODUCTION AND BACKGROUND

The construction industry is unique among other industries as the activities of construction often take place in the outdoor under conditions not conducive for safety and health. Workers in the construction sites have to face constant change in the nature of work, the location of work and the mix of workers. Most of the people tend to relate construction industry with dangerous working environment and high risk as compared to others. The reputation of construction industry is relying on the expertise of implementation and management of safety and also how it can be completed safely and meet the consumer's requirements (Mills, 2001; Loosemore *et al.* 2003; Root, 2005; Goetsch, 2005).

One of the actions that can be undertaken in order to develop good or better image of construction industry is by providing safe working environment (Jamal Khan *et al.* 2005). High accidents in construction industry are causing losses of both the number of labours and millions ringgit of properties every year in the country (Alves Dias and Coble, 1996; Singh *et al.* 1999). If this situation is not reduced to a minimum or if

possible prevented, it will hinder the country's economic growth in becoming a developed country in year 2020 (CIDB, 2000).

### **Objectives of the research**

This paper is part of a PhD research and it presents literature review related to the safety culture. This paper begins with background of safety issues and safety culture in construction industry. The objectives of this research are:

- a) To identify factors involved in the development of safety culture through searching and reviewing previous research.
- b) To present the findings of the literature review as a guide to understand the issues and problems in the development of safety culture in the construction industry.
- c) To develop safety culture conceptual framework in the construction industry in Malaysia.

### **Accident, Safety and Culture**

Nowadays, quality and safety are two main issues in construction industry. ISO 9000 has been promoted in construction industry to ensure the quality of construction work done by the contractors. Apart from quality of work, a safe working environment is very necessary to erase the high risk image closely associated with the construction industry. Construction safety is a standard of quality that is indicated in the contract and required by the client (Alves Dias and Coble, 1996). As projects are becoming more complex, safety has become a main focus in ensuring the safety of the construction personal and properties. Developed countries such as UK and Australia have enforced safety rules in contractors' works on site. Revolution and changes in safety system management has become a mandate in practicing safety action that can be managed interminable (Low and Sua, 2000). The worldwide construction industry is still practicing work process by labour intensive based on wet trades. This factor contributes to the low quality of work due to the workers' lack of expertise and training, while at the same time exposes them to the accident easily (CIDB, 2004).

Accident theory on human factors shows that there is a link of events which are caused by human faults. In this theory, there are three general factors causing human faults, namely; overload, irrelevant response, and irrelevant activities. Referring to Heinrich Theory, accidents are caused by main factors that can be predicted such as human faults, unsafe environment, or dangerous use of machineries (Goetsch, 1998). These accidents and injuries can be avoided by putting aside these factors.

Current research shows that construction industry has been labelled as an industry with low level of safety and health culture. Compared to other industries, it has been shown that this industry has the highest number of accidents. The efforts of improving the safety and health at work for this industry will become useless until the safety and health culture is improved (CIDB, 2000). The changes have to be undertaken by the construction industry towards establishing the paradigm of safety and health culture which may improve the safety and health level in line with the requirements of safety and health in the construction industry in total (Misnan *et al.* 2003).

### Definition of Safety Culture

There are hundreds of definitions of culture. Culture is difficult to define because it is a large and inclusive concept. "Everything you need to know in life to get along in a society" is not as useful a definition, however, as one that focuses on what culture's characteristics are. Culture involves learned and shared behaviours, norms, values, and material objects. It also encompasses what people create to express values, attitudes, and norms. Culture is largely undiscussed by the members who share it. Edward Hall, a key researcher into cultures, in Varner and Beamer (2005) stated:

*Culture [is] those deep, common, unstated experiences which members of a given culture share, which they communicate without knowing, and which form the backdrop against which all other events are judged .*

The concept of culture was first known to represent, in a very broad and holistic sense, the qualities of any specific human group that are passed from one generation to the next. This includes religion, way of life, values and beliefs of people. This is known as 'social culture'. People born in a particular culture are expected to believe and behave differently from others (Shamil Naoum, 2001). Similar to the social culture, each organization has its own culture dominated by its values and behaviour. This is known as 'organizational culture'.

According to Booth (1995), the term safety culture was introduced to the nuclear safety debate by the International Nuclear Safety Advisory Group of International Atomic Energy Agency (IAEA) in their analysis of the Chernobyl disaster. IAEA (1986) defined the safety culture of an organization as the product of individual and group values, attitudes, competencies and patterns of behaviour that determined the commitment to, and the style and proficiency of an organization's health and safety programmes. Overall safety culture can be described as a set of beliefs, norms attitudes and social technical practices that are concerned with minimizing the exposure of individuals, within and beyond an organization, to conditions considered dangerous or injurious.

Cooper (2000) theoretically defined safety culture as a sub-facet of organizational culture, which is thought to affect member's attitudes and behavior in relation to an organization's ongoing health and safety performance. He argued that defining the product of safety culture is very important to clarify what a safety culture should look like in an organization. He added that this also could help to determine the functional strategies required to developing this product, and it could provide an outcome measure to assess the degree to which organizations might or might not possess a 'good' safety culture. This outcome has been severely lacking in construction, hitherto.

Safety culture and culture of safety are frequently encountered terms referring to a commitment to safety that permeates all levels of an organization, from frontline personnel to executive management. More specifically, "safety culture" calls up a number of features identified in studies of high reliability organizations, organizations outside of health care with exemplary performance with respect to safety (Roberts, 1990). Whereas Cox and Cox (1991) (in industrial gases, European) defined safety culture as one which reflects the attitudes, beliefs, perceptions, and values that employees share in relation to safety. A definition of safety culture adopted by many researchers is:

*the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of an organization's health and safety*

*management characterized by communications founded on mutual trust, shared perceptions of the importance of safety and by confidence in the efficacy of preventative measures (ACSNI, 1993).*

Most definitions of safety culture encapsulate beliefs, values, and attitudes that are shared by a group. As human behaviours (and thus at an individual level, safe or unsafe behaviours) are partly guided by personal beliefs, values, and attitudes (Kleinke, 1984; Fazio, 1986), continued workplace safety may have its base in individually, and organizationally constructed shared beliefs that safety is important. A related theme evident in the definitions of safety culture offered is that of individual norms. Ostrom *et al.* (1993) argued that a culture is comprised of social norms, which are unspoken rules of behaviour that, if not followed, result in sanctions.

## **ISSUES AND PROBLEMS IN SAFETY CULTURE**

Jones (1997) stated that safety is part of important aspects which should be given an attention and guidance to improve the stated safety management to stronger safety culture. Some can be used like the method to improve safety management, plant and equipment, and workers involvement. Safety culture in construction community can be very low. Looking at that weakness in these characteristic and human attitudes, it can be concluded that to protect from accidents, it demands changing of paradigm in the characteristic and human attitudes. Previous reactive and bad attitudes, generally a norm, should be changed to positive and proactive culture (Misnan *et al.* 2006).

Two fairly distinct approaches to managing workplaces safety have competed for attention and have generated a considerable amount of debate and controversy during the past decade. The first of these approaches, behavior-based safety, focuses on the identification and modification of critical safety behaviour, and emphasizes how such behaviors are linked to workplace injuries and losses. The second approach, in contrast, emphasizes the fundamental importance of the organization's safety culture and how it shapes and influences safety behaviors and safety program effectiveness. Adding to this mix, each movement has recruited its own persuasive proponents and vocal detractors. On the surface at least, the two approaches appear to be indirect opposition to each other and represent two entirely different world views of injury causation and safety management (Dejoy, 2005).

### **Safety and Organizational Culture**

Culture is defined as those practices common to a group of people. In this context, safety can be expressed in simple direct terms as behavior affected by culture. Note that this topic encompasses both management behavior (action or inaction) and employee behavior (Eckhardt, 1996). Culture is further defined as missions interacting with work processes and corporate values to generate behavior (McSween, 2003). How a company's mission is understood, followed by expectations and processes, determines behavior.

Organizational or corporate culture as defined by Handy (1993) is the 'pervasive way of life or set of norms and values that evolve in an organization over a period of time'. Norms are unwritten but accepted rules which tell people in organizations how they are expected to behave. They may be concerned with such things as how managers deal with their staff (management style), how people work together, how hard people should work or the extent to which relationships should be formal or informal. Values are beliefs on how people should behave with regard to such matters as care and

consideration for colleagues, customer service, the achievement of high performance and quality, and innovation.

There is also some debate, initiated by Hofstede (1980), and revived by Reason (1998), about the ownership of culture. Some theorists argue that the organization has culture, whereas others argue that the organization is culture. Like organizational culture, safety culture is assumed to be a relatively stable construct, similar to personality, and resilient to change in the face of immediate and transient issues. Safety culture is often seen as a subset of organizational culture, where the beliefs and values refer specifically to matters of health and safety (Clarke, 1999).

It should be noted that the proposed definition of safety culture is stated in neutral terms. As such, the definition implies that organizational culture exists on a continuum and that organizations can have either a good or poor safety culture. However, not all definitions in the literature make this assumption. Some suggest that safety culture is either present or absent within an organization. Nevertheless, it is clear from the initial introduction of the term within various operational environments that safety culture is assumed to be a component of an organization that can be improved rather than simply instilled (IAEA, 1986; Cox and Flin, 1998). Obviously, such a distinction is important when it comes to both measuring and changing safety cultures within organizations. More specifically, safety culture is seen as a subfacet of organizational culture and exists at a higher level of abstraction than safety climate. It seems plausible that safety culture and safety climate are not reflective of a unitary concept, rather, they are complementary independent concepts (Cooper, 2000).

### **Cultural Change**

Cultural change aims to change the existing culture of an organization. Organizational or corporate culture is the system of values (what is regarded as important in organizational and individual behaviour) and accepted ways of behaviour (norms) which strongly influence 'the way things are done around here'. It is founded on well-established beliefs and assumptions.

Organizational culture is significant because it conveys a sense of identity and unity of purpose to members of an organization, facilitates the generation of commitment and helps to shape behaviour by providing guidance on what is expected. It can work for an organization by creating an environment which is conducive to high performance. It can work against an organization by encouraging unproductive behaviour. Strong cultures will have been formed over a considerable period of time and have more widely shared and more deeply held beliefs than weak ones. Strong cultures are only appropriate if they promote desirable behaviour. If they do not, they are inappropriate and must be changed (Armstrong and Stephens, 2005).

### **SAFETY CULTURE: A CONCEPTUAL FRAMEWORK**

Glendon and McKenna (1995) stated that effective safety management is both functional (involving management control, monitoring, executive and communication subsystems) and human (involving leadership, political and safety culture sub-systems paramount to safety culture). The concept of safety culture emerged from earlier ideas of organizational climate, organizational culture and safety climate. They described safety culture as the embodiment of a set of principles, which loosely defines what organization is like in terms of health and safety.

In this approach, safety is looked into from the culture point of view of shared characteristics of a group dynamic relating to a system (e.g. group, community, race, nation, religion) which include beliefs, values, attitudes, opinions and motivations. Glendon and McKenna (1995) pointed out that building a safety culture on so many diversities is not an easy task. But it had been proven that organizations with good safety cultures have employees with positive patterns of attitudes towards safety practice. These organizations have mechanisms in place to gather safety-related information, measure safety performance and bring people together to learn how to work more safely. Ostrom *et al.* (1993) looked at the employees' perceptions of safety culture as follows:

- Management attitudes towards safety;
- Perceived level of risk;
- Effects of work pace;
- Management actions towards safety;
- Status of safety adviser and safety committee;
- Importance of health and safety training; and
- Social status of safety and promotion.

Creating a culture of safety means that the employees are constantly aware of hazards in the workplace, including the ones that they create themselves. It becomes second nature to the employees to take steps to improve safety. The responsibility is on everyone, not just the management. However, this is a long process to get to that point (Dilley and Kleiner, 1996).

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. Glendon and McKenna (1995) also identified four critical indicators of safety culture. They are:

- Effective communication, it leads to commonly understood goals and means to achieve them at all levels.
- Good organizational learning, whereby organizations are able to identify and respond appropriately to changes.
- Organizational focus upon health and safety, how much time and attention is essentially paid to health and safety.
- External factors, including the financial health of the organization, the prevailing economic climate and impact of regulation and how well these are managed.

The theoretical and empirical development of safety culture and climate has followed the pattern set by organizational culture and climate, although to a lesser extent. As

stated previously, most efforts have focused on the empirical issues surrounding safety climate although it is possible to identify theoretical development of concepts within the safety culture literature. Also, the terms safety culture and safety climate have been used interchangeably in the literature (Cox and Flin, 1998). Cox and Cox (1996) also demonstrated this point by likening culture to personality, and climate to mood. Conducting a survey will assess the current mood state of an individual. Some responses may be indicative of the individual's stable underlying beliefs, constructs and personality but overall, the survey will reflect how the individual feels at that point in time. The comparison between culture and personality seems attractive because personality is relatively stable over time whereas climate and mood can be susceptible to short-term fluctuations (Pervin, 2003).

Creating a safe and healthy work culture requires the inculcation of safe and healthy practices as part of everyday life, at work and at home among all the workers in Malaysia. Culture means doing something automatically, spontaneously, without having second thoughts about it. In occupational safety, a safety culture means automatically correcting a hazardous act of job task or eliminating a hazardous condition. In occupational health, it means automatically undertaking measures to ensure protection from health hazards at the workplace using personal protective equipment and without having to be told repeatedly to do so (Lee, 2003).

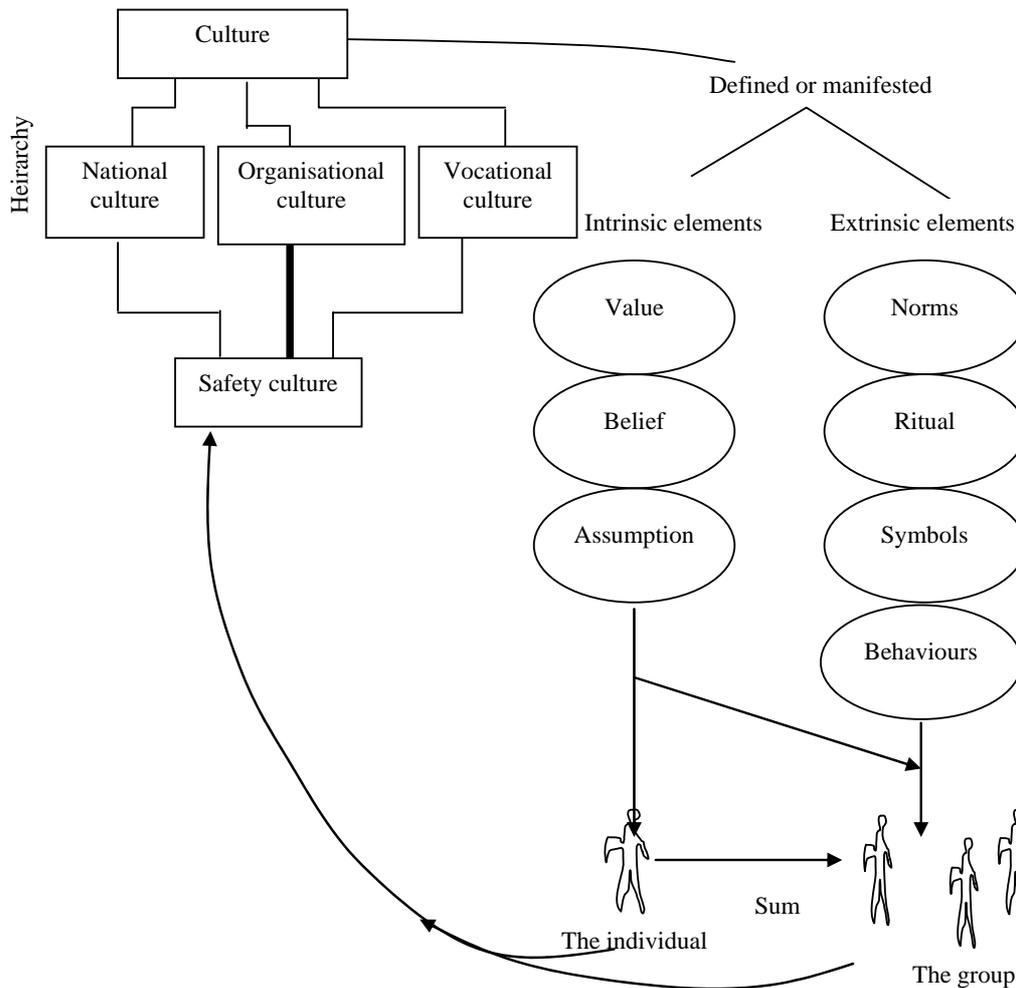
### **Concept of Safety Culture in Construction Industry**

Today, the changes in safety management have opened a new outlook to work safety. It is no longer being treated as secondary in the business context rather it is treated as a culture. More emphasis is being put on ensuring everyone understand the importance of safety and changing the attitudes and behaviour is the hard task. Safety is not only the manager's responsibility but everyone must play part (Stewart, 2002).

Figure 1 shows the conceptual framework of safety culture development. The development of safety culture based on the framework views the overall individual to group responsibility that develops the total value of safety culture which support the organizational culture. Everyone must play part in the organizational culture to ensure correct understanding of the importance of safety and changing the attitude and behaviour through the intrinsic and extrinsic element of the culture. Organizational culture will be transmitted to all organization activities which involve intrinsic and extrinsic elements of the organization. This will in turn be transmitted to every member in the organization. All intrinsic and extrinsic elements of culture will affect the organization culture throughout the development of safety culture. Consequently, it makes the concept of safety culture more acceptable with expected wider attention. It does not mean that the safety system nowadays is not relevant for practices, but this system will function well when the organization has developed safety culture. The reason can be seen from different aspects: the existence of barrier in safety system which may be less if the organization can develop strong safety culture.

For a long time, the construction industry has been labelled 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 (Misnan *et al.* 2006). As the result, there is a need for a major paradigm shift regarding attitudes on occupational safety and health in construction sites. Widening the understanding of behaviour increases insight into possible targets for improvements, for example better planning, more effective job design, or more

comfortable personal protection. Human behaviour influence on safety performance is enormous. Therefore, this root problem must be solved effectively.



**Figure 1:** Conceptual framework of safety culture development

The legislation has changed over the years with more emphasis on safety at work. Still today the rules and regulations are being improved to make the working environment safe. Besides the effect of laws, many safety activism factors also influence the decision of modern managers regarding health and safety such as the active role of the trade unions, consumerism and the legal battle by accident/incident victims. All these factors are forcing managers to change their attitudes towards safety. It is clear that working environment safety is going to be better. Managers are now adopting proactive approaches towards safety.

## CONCLUSION

In summary, there appears to be considerable evidence suggesting that organizational and contextual factors are important in terms of a variety of workplace safety related outcomes. However, current definitions of safety culture remain rather vague and variable, and current knowledge does not permit precise statements about which factors are most important in which organizations or situations. Also, systematic studies evaluating field-based interventions specifically targeted to safety culture change are conspicuous in their absence. But this is perhaps not that surprising given

current conceptual and measurement limitations. It is also worth noting that intervening into the culture of an organization is difficult under the best of circumstances, because it requires that the organization be willing to look at itself and make fundamental changes in the way it pursues its core activities. These limitations notwithstanding, the importance and usefulness of organizational culture as it pertains to workplace safety appears to be broadly accepted by researchers and practitioners alike.

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