Abstract

Human behaviour is a major contributor of construction accidents revealed by many occupational safety literatures. The presence of good safety behaviour does reflect good safety compliance. Safety issue cannot be tackle effectively without interference of employers with a particular pattern of behaviours as important criteria needed to change employee’s behaviours. Thus, the primary objective of this study is to identify employers’ behavioural safety compliance factors contribute to encourage employees’ towards behavioural safety compliance. This paper is an initial study with the hope that the finding will leads the establishment of safety indicators for behavioural safety compliance in the construction industry.

Keywords: Construction safety; safety behaviour; safety compliance; safety improvement approaches

1. Introduction

The construction industry in Malaysia is one most contributor to create wealth for the country’s economic growth. Improving safety remains a priority in every country around the world because it is one main contributor which ranks high in the rates of severe and fatal occupational injuries compare to other industries (Bhattacharjee and Gosh, 2011). The major construction accidents contributor which is human
behaviour will obstruct attempt to achieve Malaysia vision 2020. So, the employer needs to adapt more holistic tactics and approaches which focus not only improving physical working environment but also on shaping employee’s behaviours, attitudes and beliefs which lead to safety behaviour and ultimately safety compliance. The term “employer” in the aspect of this study is define as principal employer or main contractor of construction organisation as stipulated in OSHA 1994 for example owner of the companies, the CEO or directors and any senior managers at top management level who has an empowerment to rules safety and health to the employees. Generally, the employers are aware that they have a role to comply with safety programmed and plays safe behaviour as stipulated in OSHA 1994 Section 17 (Duties of employers and self employed to their employees).

The occupational, safety and health Act (OSHA), 1994 are identified as an approach providing legislative framework to enforce human behaviour towards safety compliance by practicing high standards of safety and health at work to eliminate workplace accidents. However, ignorant behaviour and attitude from the employers and employees contribute to rise of issue on behavioural safety non-compliance (Jamal Khan, 2006) to OSH requirements such as Occupational Safety and Health Act (OSHA) 1994. In respect to many incidences of non-compliance to the provision of act, common reasons given by the employers were; not aware to OSHA 1994, no time for OSH matters, not enough allocation of resources for OSH, OSH is not important and “accidents would not occur to me” syndrome. As for the employees, their non-compliance was reasons such as; not aware of safety and health regulation, OSH rules and regulation are difficult to follow, feeling of discomfort when complying with OSH rules and regulation and “accidents would not occur to me” syndrome.

Many researchers have put an effort to combat an issue on occupational accidents where there is a good understanding of the extent and pattern of accidents in the construction industry, however, there is only limited literature about safety behaviour factors contributing to those and relatively a scares when compared with other industrial sectors in our society. From the context of occupational, safety and health issue in Malaysia, Fernando (2008) has conducted a study to identify workers characteristics and factors of safety compliance at the processing area in petrochemical industry, Malaysia. The factors identified are; management commitment, employee involvement, safety communication, effective safety training and effective safety feedback. The others, a study has been conducted by McDonald (2003) to 18 construction sites in Ireland with the main aim to investigate the factors associated to influence safety behaviour and safety compliance on construction sites towards safety requirement.

Hence, this study is done in the context of the Malaysian construction industry on behavioural safety compliance factors particularly to management level role towards occupational, safety and health improvement. This paper summarized and focuses on factors of employers’ behaviour as the main significant cause to encourage employees’ behaviour towards safety compliance to occupational, safety and health improvement in the construction industry.

2. Literature Review

2.1. Defining Safety Behaviour and Safety Compliance

Behaviour is define as everything a person does that are observable and measureable (Vijayakumar, 2007). Safety behaviour describes the behaviour that support safety practices and activities such as providing safety training and safety compliance explains the core activities that need to be carried by employees according to occupational, safety and health requirements to prevent workplace accidents (Mahmood, 2010). Safety behaviour is the key reducing the injuries at the workplace and indirectly influencing the outcomes of the event before the injuries or accidents occurred (Johnson, 2003). A study has been conducted by Glendon and Litherland (2001), measuring safety performance using observation
behavioural sampling of critical behaviour checklist. Thus, employee behavior randomly sampling by trained observers evaluate the proportion of unsafe working behaviours such as non-compliance to manual handling and personal protective equipment practice (PPE).

Safety compliance is ranged from good to poor where comply with safety requirements remark as good safety compliance and not comply with safety requirements remark as poor safety compliance. The ABC model of behaviour by Frederick (1982) as cited in Abang Abdullah et al., (2005) explained that behaviour is influenced by two distinct factors: activators and consequences. First, is activators tell people what they should doing for example roadways sign instruct the driver to comply with speed limit and the other is activators influenced the driver to take shortcut such as seeing others exceed the posted speed limit. Faced with these competing activators, the driver will performs certain behaviour, which comes to consequences the driver expects to gain or avoid. Hence, the enforcement on safety behaviour factors plays the crucial to encourage safety compliance before the consequences occurred.

![Fig. 1. Behaviour Change Interventions](image)

### 2.2. Safety Compliance vs. Non-compliance with Safety Requirements

The main contributory factor in incident and accident occurrence is noncompliance to safety requirements in a wide range of industries as agreed by occupational literatures. Occupational, safety and health requirements such as OSHA 1994 is an example of government commitment towards regulatory compliance and being realized as a key defense against hazards in the construction industry in Malaysia. Compliance with safety requirements will help the work can be done both efficiently and safely. One very promising line of enquiry concerning the behavioral antecedents of accidents concerns the relationship among these procedural instructions governing work and the way in which work is done (Che Hassan et al., 2007). Thus, much could be improved with enough room for improvement towards behavioural safety compliance through strong effort to comply with safety requirements by both employers and employees.

### 2.3. Behavioural Safety Compliance Factors

A thorough and extensive review of the literature from journals articles and conference proceedings identified several factors of employers’ behaviour contributes to encourage employees’ safety compliance to occupational, safety and health improvement in the construction industry. By doing preliminary pilot study to the industry using interview questionnaires survey, this paper conclude ten major factors that can give positive impetus towards improving safety compliance in the construction industry.

#### 2.3.1. Management Commitment

Management commitment is agreed as the main significant factors by many researchers in occupational literature. Top management should actively lead the organization and employees towards
achievement of organization safety goals by showing that organization is serious about safety. This statement support by Jaselski et al., (1996) who reported that commitment and support by top management would significantly drive up the performance of safety. Together with, employer should demonstrate their commitment through strongly realization of safety compliance to safety requirements and ensure that everyone in the organization is certain about their safety and health responsibilities (Fernando et al., 2008). He summarized that manager commitment factors towards realization of safety compliance in Petrochemical Processing Area such as; properly constituted joint safety and health committees at site and departmental level, accountability of managers to the joint safety and health committee, engagement of safety and health representatives with the health and safety practitioners, dialogue among local area and line managers within the establishment of safety and health representatives, the provision time of facility to have the safety and health representative functions such as joint safety and health inspection, investigations of employees complaint, making representations to managers to managers and so on, involvement of safety and health representatives in reporting and monitoring on OSH, access of safety and health representatives to employees and access to have training for safety and health representatives (Walters and Nicholas, 2006). Hence, management commitment towards safety and health at the workplace can change behaviour of their employees (Thye, 2006).

2.3.2. Organisational Commitment

Most definitions of organizational commitment describes construct in terms of the extent to which an employee identities with and involved in an organisation (Curry, Wakefield, Price and Mueller, 1986). Organisation commitment has been identified as a critical factor in understanding and explaining the work related behaviour of employees in organizations (Bakshi et al., 2009). Hofmann and Mergeson (1999) in a study between manufacturing employees producing commercial heating and air-conditioning systems found organization support and commitment on employee safety and quality of exchange relationships between supervisors and subordinates safety behaviour and reduced accidents.

2.3.3. Safety Communication

Many construction accidents are found mainly caused by symptoms of safety non-compliance to safety requirements. Effective communications is an essential consideration to safe and efficient workplace. Leaders convey vision and values through interaction and communication (Ismail, 2007) and effective communication leads to commonly understood goals and mean to achieve them at all level. Zohar (2002) in a study between line workers and supervisors working in maintenance of heavy duty equipment found improved communication channel resulted decreased in micro accidents and increased in using Personal Protective Equipment (PPE). Communication can be achieved in three ways:

- Through visible behaviour, employer can communicates the importance of safety and health. Employees soon recognize what employer regard as important and will adopt their own behavior accordingly. Thus, through negative behavior employer can undermines the safety and health culture of the organization.
- Written communication of Health and safety policy statements, statements concerning health and safety roles and responsibilities, performance standards and findings from risk assessments.
- Face to face discussions between employer and employee enable employees to make a personal contribution and helps employees feel involved in the safety and health of the organization. Ideally employees should be able to talk to employer during safety inspection.
2.3.4. Safety Leadership

Senior management leadership demonstrating to management level play a primary role in shaping management behaviours that in turn influenced employee behaviour (Cooper, 2010). Achievement of the other safety management objectives are largely dependent on the quality and consistency of leadership demonstrates by management and is a role model for safety exercise (Ismail, 2007). Leadership enables the employer to energises the employee to take OSH to the next level which leadership is all to do with people not a thing. Leadership is the quality that transforms good intentions into positive action, in turns a group of individuals into a team (Warmick, 2006). Michael, Guo, Wiedenbeck and Ray (2006) in a study between blue collar employees in wood product manufacturing facilities found that positive leadership improved safety behaviour of the employees.

2.3.5. Effective Safety Training

Effective safety training is important to educate employees on potential of accidents, how to prevent accidents and potential hazards involved in their jobs. Hence, training and education programs play a significant role in enhancement of safety in construction and important to increase safety awareness (Ghani et al., 2010) and change behaviour of employees (Wong et al., 2000). According to study conducted by McDonald (2003) to 18 construction site in Ireland stating that safety training is carried out without systematic schedule which primarily to “cover themselves” and protect company if something goes wrong with little expectation that it would influence the knowledge and behaviour of employees. Thus, it seems very clear that majority of employees have to gain knowledge of risks of their work through their experience of work itself. Insufficient safety training between the employees are general root cause of accidents in the construction sites because they did not have the knowledge, education and skills to recognized potential hazards at site (Toole, 2002). Komaki, Heinzman, and Wyld (1980) study between vehicles maintenance employees found that safety training have strong linkage to employees’ safety behaviour improvement. According to Hopton (1969), trainings aimed at workers and operator would not only reduce accidents, but may also reduce costs and save lives.

2.3.6. Safety Motivation

Employer or top management involvement such as relationship with employees, talk on safety and advice on safety matter is related to improve safety motivation and will encourage employees’ safety behaviour (Che Hassan, 2007). According to Evelyn (2005), there is two types of motivation which is positive reinforcement where gives employees outcomes such as monetary rewards, bonuses and job promotion whereas the others is negative reinforcement where employers may criticize, punished and threaten the employees to motivate them to perform their jobs in the safe manners. However, reinforcement on positive motivation is more encourage by many safety practitioner to maintain improve employees’ good safety behaviour. Safety improvement also will only be achieved if incentives schemes are carried out to motivate employees to change their behaviours (Vrenderburgh, 2002). The organization that creates and maintain good quality employer and employee relationships will benefit from higher levels of the employee motivation, commitment and job satisfaction, which in turn impacted positively on the intention to stay and employee performance (Leung et al., 2004).

2.3.7. Safety Management System

Management must show that they have taken active steps to implement sound OSH management system, including proper risk assessments, reporting systems, safety plan, clear delegation of responsibilities, provide adequate resources and ensure that full information is disseminated to workers and other person exposed to risks (Muhammad, 2006). The documentation of risk assessments play significant role in ongoing management activities and their function appeared solely to meet legislative
requirements relevant to site activities. Different site have a different nature of task and function of safety management system such as safety plan must specific to potential hazard perceived to be occurred on site activities. In many overseas constructions site, some or all the management level had undertaken CIF/CEF training courses which seem to gain better safety compliance. It is recommended for management level to undertake special training course especially on behavioural aspect which perceived to give them basis on managing uncertainty of human behaviour and training course in safety and health management system to ensure it can be effectively deliver to supervise employees towards behavioural safety compliance.

2.3.8. Safety Guidelines and Regulation

The occupational, safety and health act (OSHA) 1994 is an example of safety guidelines and regulation which provides legislative framework to promote and encourage high standards of safety and health at work thus the primary aim of the act is to promote safety and health awareness and to instill safety culture among all Malaysian workforces (Ismail, 2010). Besides, employee’s poor perception on employer compliance to safety requirements could lead to negative behaviour and correlate with poor safety performance which carries enormous negative consequences to the individual and the organisation where they work (Jamal Khan, 2003). According to study conducted by McDonald (2003) to 18 construction sites in Ireland stating that level of safety compliance to safety requirements was quite variable and the was much could be improved in most site.

2.3.9. Safety and Health Officer

The requirement of safety and health officer is clearly stated in the occupational, safety and health (safety and health officer) regulation 1997 where the employer of the following class or description of industries shall employ a suitable, knowledge, experience and skills safety and health officer for the specific performance of the specific work. It is agreed that safety and health officer is highly empowered to change or improve the company’s safety performance. A study by McDonald (2003) to construction sites recommend that all site should have the safety and health offices which demonstrate potentially strong role of safety and health officer can influence both behaviour and compliance of employees with safety requirements. He added, the strongest relationship with safety compliance is the presence of safety and health officer with better safety management performance for example response to audits and reporting the hazard to ensure it leads to better safety compliance on site in future. Hence, the role of safety and health officer should be strengthened and their function should be reinforced as part of the safety management system.

2.3.10. Personal Protective Equipment (PPE)

The employer also has to supervise employee from time to time to ensure they will always follow the rules to wear safety tools to keep their safety is always a priority when perform jobs at construction sites. Frank Harris and Ronald McCaffer (1982), employer must provide protective personal equipment to the workers, especially for those that work in construction sites to reduce the death of the worker if they wear personal protective equipment. Duff et al., 1993 in the study of construction industry in the United Kingdom found percentages of non-compliance with specific categories in six construction sites ranging from 22-38% of noncompliance in housekeeping, from 12-43% of noncompliance in scaffolding, from 20-26% of noncompliance in access-to-heights, and from 21-65% of non-compliance in using PPE. Robertson et al., (1999) in the study at United Kingdom found that non-compliance was around 19% for housekeeping, 16% for scaffolding, 15% for access to height and 21% for PPE. Lingard et al., (1997) reported from Hong Kong percentage ranging from 30-49% for housekeeping, from 30-66% for bamboo
scaffolding, from 50-74% for access to heights and 49-69% of non-compliance for PPE. Among others, the factor of Personal Protective Equipment (PPE) shows high percentage of non-compliance percentage.

3. Methodology

An attempt was carried out by conducting preliminary pilot study using five Likert scales of interview questionnaires survey consisting of ten (10) grade seven contractors listed under the Construction Industry Development Board (CIDB) directory, who undertake Building Works within the Klang Valley area. The aim of this survey is to determine employers’ perceived on the factors of behavioural safety compliance identified to be fully reinforced towards achievement of organisation’s goals. Convenience sampling involves collecting information from members of the population who were conveniently available to provide it (Sekaran, 2000). The scale in each items of questionnaires, allowed the interviewee to show the extents of theirs agreement with the given statement. The aim of this interview questionnaires survey is to determine major factors that contribute to improve safety compliance. In this study the scale values from one for “strongly disagree” to five for “strongly agree”. Two (2) techniques were used to obtain and analysed the data. First technique was using marking form which the purpose is to obtain the factor contributes of each interviewee. The second technique is Average Index Method. The researcher has used this technique to analyze the factor that contributes to behavioural safety compliance factors. The questionnaire had contained two sections. Section A involved items requesting the demographic information of interviewee. Section B involved ten (10) factors of employers’ behavioural safety compliance that was summarized from extensive and thorough literature review to journal articles and proceedings. The ten (10) variables were; management commitment, organizational commitment, safety communication, safety leadership, effective safety training, safety motivation, safety management system, safety rules and regulation, safety and health officer and personal protective equipment ranked in an ascending order.

4. Results and Discussions

A thorough and extensive review of the literature from journal articles and proceedings had been conducted to identify the factors of employers’ behavioural safety compliance towards occupational safety and health improvement in the construction industry. The pilot study using interview questionnaires survey held among contractors in Klang Valley area. The findings revealed that the major employers’ behavioural safety compliance factors derived are management commitment and followed by organizational commitment, safety communication, safety leadership, effective safety training, safety motivation, safety management system, safety rules and regulation, safety and health officer and personal protective equipment were ranked in an ascending order of importance. It will be the factors of employer’s behaviour that contributes to encourage employees’ behaviour towards safe compliance to occupational safety and health in the construction industry.

Since the type of scale used was ordinal, median score was used to measure all the dimensions. Then, calculation of median score using the average score obtained. The median score for the dimensions which midpoint scale stating (scale of 3) out of a 5-point Likert Scale where (1=strongly disagree and 5=strongly agree). Among others, management commitment shows the highest at 4.39 or 88 percentage point revealed that most organizations have agreed that high emphasis of management commitment is significant to improve employees’ behavioural safety compliance towards occupational safety and health in the construction industry. It is follow by organizational commitment about 4.26 or 85 percentage point, safety communication about 4.22 or 84 percentage point, effective safety training about 3.87 or 77 percentage point, safety leadership about 3.69 or 74 percentage point, safety management system about
3.61 or 72 percentage point, safety motivation about 3.48 or 70 percentage point, safety rules and regulation obtain about 3.48 or 70 percentage point, safety and health officer about 3.30 or 66 percentage point and personal protective equipment 3.13 or 65 percentage point were ranked in an ascending order of important factor in the view of Malaysia construction organisation.

The result of these distribution factors explained that construction organization in Malaysia agreed that for safety and health to perform positively improvement strong emphasis and effort should be placed by employer or top management level to take part factor of human behaviour into safety management. This will be as one of the main consideration in developing organization planning towards organizational safety goal through good safety behavior by both employer and employee towards occupational safety and health improvement in the construction industry. The huge challenges faced by employer is majority of the construction employees in Malaysia especially in Klang Valley area is foreigner where some of them brought the behaviour by their culture of their home country which agricultural base for example not used to wear personal protective equipment, PPE. In facing this challenge for shaping their behaviour towards behavioural safety compliance, employers need to adapt holistic tactics to overcome the problems as recommended by this research.

5. Conclusion

This paper has argued the need of safety behaviour where high employers impetus towards factors identified is agreed by many researchers’ to help the organisation continuously to improve safety compliance and safety performance in the construction industry. Employers and Employees with good safety behaviour are particularly play a significant role in achievement of safety compliance to occupational, safety and health improvement in the construction industry. Studies have shown that an improvement need to be done whereas employers’ behavioral safety compliance factors are highly recommended to be provided and reinforced by employers to the employees in order to achieve organization goals and eliminate construction accidents. Active involvement of behavioural safety compliance identified will resulted in greater influence among employees and improves safety behaviour. The others, the significant roles of employers’ behavioural safety compliance factors can give value and benefit construction where it can elevate safety concerns and cultivates a vision for the future.

Studies have shown that Occupational, safety and health Act (OSHA) 1994 are identified as an effective approach providing legislative framework to enforce human behaviour towards safety compliance. The Occupational Safety and Health Act (OSHA) 1994 were enacted on a self regulatory basis to promote safety culture (Faridah et al, 2010). Exercising these elements would not only encourage employers and employees to change their behaviour towards occupational, safety and health improvement hence protect employees from occupational accidents, injuries and illnesses. It will discipline the employees as one strong team to give full support towards achievement of organization safety goal and help construction Industry Master Plan (CIMP) 2006-2015 initiated by Construction Industry Development Board (CIDB) achieves its aim and objectives. It is ended that, there is enough room for improvement due to understanding that good behaviour can be sharpen towards behavioural safety compliance to occupational, safety and health improvement in the construction industry. Hence, this initial finding leads to the establishment of the on-going research areas currently undertaken by the researcher that needs to be addressed for employers’ behavioural safety compliance towards occupational, safety and health improvement in the construction industry.
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