

# CONTRACTORS' COMPLIANCE ON OCCUPATIONAL SAFETY AND HEALTH (OSH) POLICIES IN MALAYSIA'S CONSTRUCTION INDUSTRY

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**Abstract**— The statistic of accidents at construction sites give us a picture that Malaysian construction industry is one of the critical sectors that need a huge and fast overhaul. In order to improve the overall safety performance, a policy of occupational safety and health (OSH) was enforced by the government as a guideline and rules that should be followed in dealing with OSH activities at the construction site. Therefore, a study has been conducted to identify the types of accidents that occurred at construction sites based on OSH guidelines of the public and workers and to evaluate the implementation of the variables in the OSH guidelines that give impact to contractors' grade. This study was started out by identifying the 12 variables of the OSH guidelines. Then reported accidents cases from 2010 to 2013 kept by the Department of Occupational Safety and Health Malaysia (DOSH) were examined and classified according to the variables to identify the types of accidents. The observations by using checklist were carried out at 12 construction sites around the district of Melaka Tengah involving contractors of G6 and G7. Structural interviews were also be made to support the observations that have been carried out. The finding of this study reveals that all variables directly involved in contributing to the accident at the construction site. Accidents due to superstructure activities topped the list in the past four years. Apart, the observations found that the level of compliance with OSH by both grades of contractors at the construction sites were unsatisfactory since OSH policy was not fully practiced. Non-compliance of hoarding set up became the critical variable. This mismatch is further examined by correlation analyses which link both objectives and demonstrated a weak relationship. Thus, the research concluded that non-compliance of contractors on OSH policy was not the main contributing factor for most accidents at the construction site.

**Keywords**—Construction accident; OSH policy; Guidelines; Safety; Non-compliance

## I. INTRODUCTION

In Malaysia, the construction industry is one industry that contributes significantly to economic growth and country progresses [1]. However, this achievement has brought increased injuries and fatalities in this industry due to lack of focus in occupational safety and health.

Generally, the construction industry is a high risk industry because there is a high risk of accident occurrence. Construction workers are exposed to falling from heights, movement of plant and machinery, electrical shocks, excessive noise, etc. Reasons are time, cost and quality that are always the main factors considered ahead of safety. Safety issues are always considered secondary and take a back seat in construction. Many employers have not established comprehensive accident prevention policies but instead concentrate on maximizing profit [2]. Therefore, on 25<sup>th</sup> February 1994 the government has enforced an occupational safety and health policies based on the provisions of the Occupational Safety and Health Act 1994 (ACT 154). This policy was established to provide guidelines and procedures to be followed in dealing with occupational safety and health activities at site [3] [4].

In order to prevent an accident, preventive measures must be taken. This policy must be complied and implemented with commitment and relentless efforts to achieve the goal to reduce accidents next target of zero accidents at construction sites. Therefore, this study focuses on occupational safety and health policies implemented by the construction companies. Two objectives of this study are to identify the types of accidents that occur at construction sites based on OSH guidelines of the public and workers and to evaluate the implementation of the variables in the OSH guidelines that give impact to contractors' grades.

## II. OCCUPATIONAL SAFETY AND HEALTH

Health and safety is a cross-disciplinary concept that is concerned with protecting the safety, health, and welfare

of people engaged in work or employment [5]. According to Kheni [6], health and safety at construction sites deals with both physical and psychological well-being of workers on construction sites and other person whose health is likely to be adversely affected by construction activities.

The World Health Organization's (WHO) definition of health is a state of complete physical, mental and social well-being. Whereas health of the worker is define as free from any physical health disease, a mental and social activity that is related to the working conditions, working practices and the working environment [7]. Oxford Online Dictionary defines safety as the condition of being protected from or unlikely to cause danger, risk, or injury. While safety of a worker is define by Occupational Safety and Health Administration (OSHA) as to protect the workers from accident, injuries and threat from the occupational workplace, unsafe environment and etc. In the context of civil engineering, safety is defined as the discipline of preserving the health of those who build, operate, maintain, and demolish engineering works and of others affected by those works, as well as freedom from danger of risks [8].

#### A. Accident at Construction Site

Accidents, incidents, injuries, and fatalities continue to occur unabatedly on construction sites around the world at consistently high rates [9]. The World Health Organisation (WHO) noted with concerns that 1.7 million people worldwide die annually of work related injuries and illnesses. 268 million non-fatal workplace incidents and 160 million work related illnesses. Based on Social Security Organization (SOCISO) report in 2013, the fatality rate in the construction industry in Malaysia was of more than three times of all workplaces. Internationally, construction workers are two to three times more likely to die on the job than workers in other industries while the risk of serious injury is almost 3 times higher [10]. In Malaysia, statistical

data shows (see Fig. 1) that manufacturing, agriculture, forestry, logging and finishing, transport, storage and communication and construction take lead in the occupational accidents. Although construction industry is not the highest injuries rates among those industries, but its fatality rate is still considered as high [11]. Health and safety problems were bound to happen at construction site. It is unavoidable; however we can control this by detailed regulations. Effective health and safety management needs to be implemented at the construction site.

#### B. Occupational Safety and Health Act 1994 (OSHA 1994)

The Occupational Safety and Health can be described as act that provides the legislative framework in terms of securing the safety, health and welfare among the entire Malaysian workforces. Instead of that, it also had been established to protect others against risks to safety and health which in connection of the activities conducted by the persons at the workplace. This act also had been gazetted on 24<sup>th</sup> February 1994 as the practical tool or medium which superimposed on the existing safety and health legislation.

The provision of this act is based on the self-regulation scheme that had been designed to synchronize with the particular organization or industrial firm. This act also aims to establish the effective safety and health performance. The conceptualization of self-regulation encourages the participation of employees and management including the top management in terms of improving or upgrading the safe working environment at the workplace. The act was established by the Department of Occupational Safety and Health (DOSH) which is the government body under the Ministry of Human Resources in Malaysia [3].

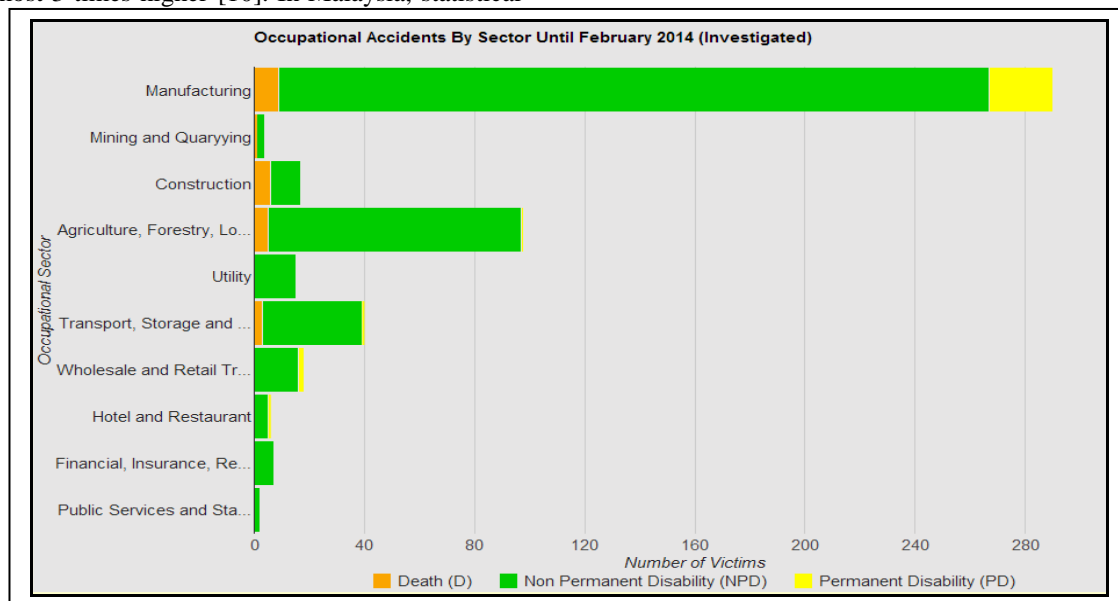


Fig. 1: Occupational accidents by sector until February 2014

Source: (Department of Occupational Safety and Health)

### C. Guidelines on Occupational Safety and Health at Construction Site

The guidelines were issued by the Department of Occupational Safety and Health (DOSH). The purpose of these guidelines is to provide guidance to employers on how work practice can be carried out on every activity in the construction to prevent accident to the workers and public. These guidelines can be used as a standard reference for developers, contractors, engineers, architects, designers, and safety and health officers. Among the factors that should be implemented at construction sites are emergency response plan, hoarding, movement of vehicular traffic, disconnection of utilities, demolition, blasting and use of explosives, site clearing, excavation work, piling, superstructure, finishing, and use of hoisting equipment [12].

### III. METHODOLOGY OF THE STUDY

The study had been conducted through several phases namely literature review, data collection, data analysis, discussion and conclusion. The literature review was conducted by encompassing all various means available to obtain the widest range of the relevant information from books, articles, and websites related to the variables of OSH guidelines in construction. Information obtained was then been used in the assessment for the first and second objective. The first objective was achieved through the analysis of the reported accident cases from year 2010 to 2013 from DOSH's website [11]. In order to maintain the validity of the data, qualitative document analysis approach was conducted by using manual looping system (see Fig. 2).

Since accident cases were documented by DOSH investigating officers and were published first-hand through DOSH's website, it provides less biased data. These documents were examined thoroughly and the types of accident were classified into predetermined categories of twelve variables based on the causes stated in the DOSH documents. Then the number of counts for each case was

calculated. Those counts were then averaged out in order to calculate the percentage frequency based on the twelve most influential factors. This study adopted an approach by Pipitsupaphol and Watanabe [13] that classify the accident cases based on twelve most influential factors to identify the types of accidents.

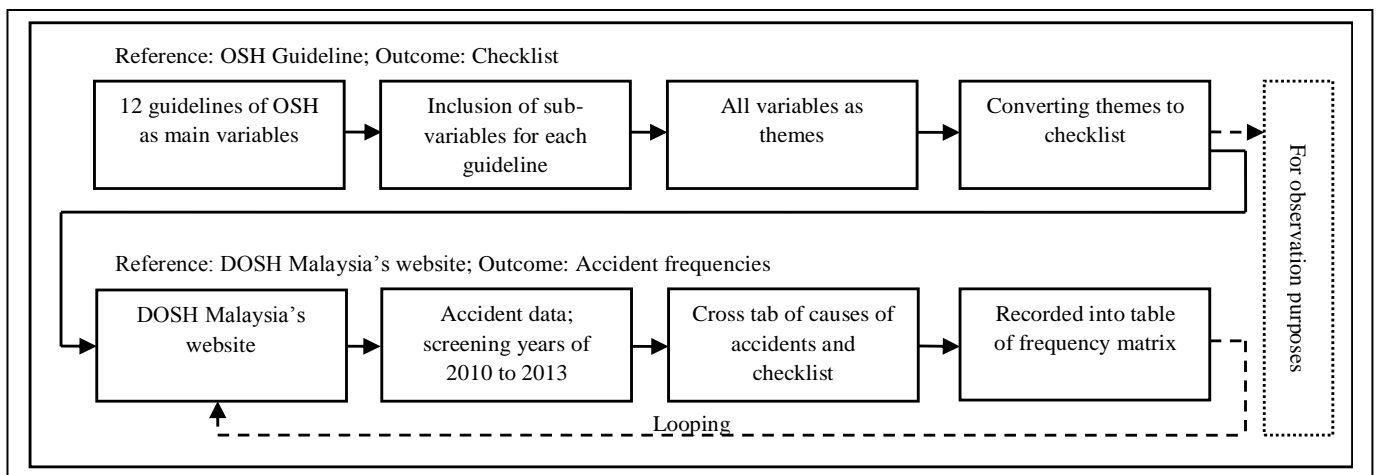
The second objective was achieved through the observations involving 12 construction sites around the district of Melaka Tengah which consists of contractors G6 and G7, where both were registered with Construction Industry Development Board of Malaysia (CIDB). A checklist was designed (as per Fig. 2) to assist the observation and to evaluate the variables in OSH guidelines for their implementation-wise. Structural interviews were also been made to support the observations that have been carried out in order to support any data that cannot be identified through observation per se. Both methods are important to ensure the researcher experiencing the real situation that occurred at the construction site and in the same time able to maintain transparency.

### IV. RESULTS AND DISCUSSION

Summary of the results and discussions presented below are based on the analysis of the construction accident reports and checklist that answered objective 1 and 2 respectively.

#### A. Types of Construction Accidents from DOSH Reports

The results were obtained by examining 65 accident cases from DOSH reports from 2010 to 2013 as shown in Fig. 3 which indicate types of accidents that were occurred at construction sites. Superstructure (35.53%), movement of vehicular traffic (21.05%), and use of hoisting equipment (15.79%) was the top tier of types of accidents in construction. Other factors such as site clearing (6.58%), hoarding (3.95%), disconnection of utilities (3.95%), excavation work (3.95%), emergency response plan (2.63%), and piling (2.63%) remains the latter tiers.



**Fig. 2:** Manual looping system of document analysis

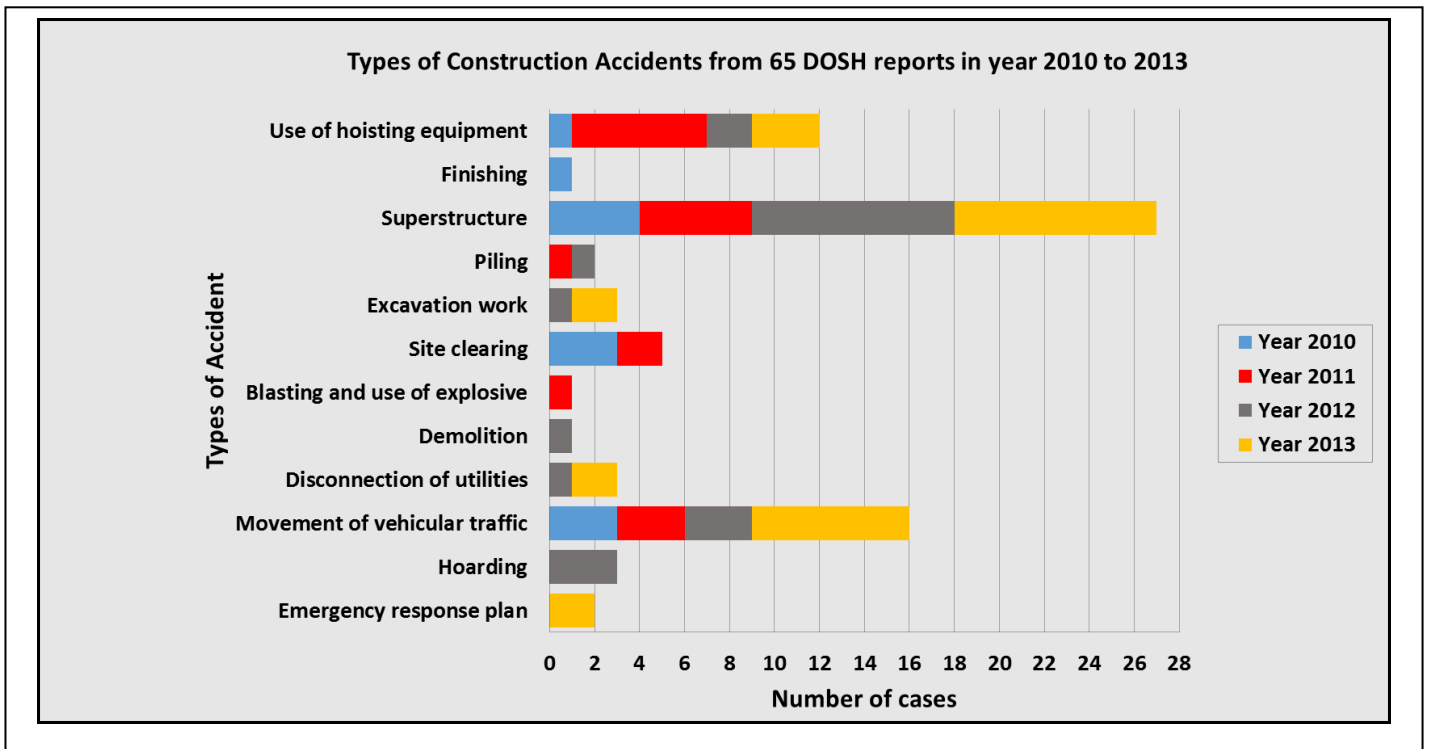
Similarly, Pipitsupaphol and Watanabe [13] had found that the most frequently occurring type of accident in Thailand was superstructure. Superstructure also has been the cause of the highest number of injuries and fatalities in the U.S. construction industry as reported by OSHA and Huang et al. [14]. The reasons behind such incident are inadequate scaffolding, safety net and catch platform were not installed, lack of edge protection, unprotected openings in buildings, lack of edge protection in roof work, lack of toe boards on scaffoldings, lack of tool belts for workers. To prevent fall accidents, few preventive measures must be taken. Superstructure elements such as scaffolding, safety nets must be installed and designed according to standards. Scaffolding must be properly put up and its stability ensured to prevent any untoward incident. Workers working at high places must be equipped with personal protective equipment (PPE) and all potential hazards must be identified, assessed and removed to reduce accidents.

#### B. Results of Observation by Checklist

This analysis examines only the contractor's non-compliance on the variables in the OSH guidelines which should be implemented at the construction site. It is differentiated by grade of contractors where the comparisons between both contractors (Grade 6 and Grade 7) can be

made. Fig. 4 shows the checklist analysis that representing the non-compliance of Grade 6 contractors (5 nos.). The non-compliance variables were mainly contributed by hoarding (15.97%), excavation work (14.86%), use of hoisting equipment (14.38%), and followed by superstructure (13.98%). Meanwhile, Fig. 5 represents the non-compliance of Grade 7 contractors (7 nos.). It was attributed highly by hoarding (22.17%), superstructure (16.78%), and followed by blasting and use of explosive (14.38%).

Similarly, the analysis found that generally both contractors were mostly did not comply with the same variable; e.g. the implementation of the hoarding at the construction site. This indicates that most of contractors do not realize the importance of the implementation of the hoarding at the construction site. They might consider it as trivial and would not leave any effect if not properly implemented in accordance with the law as there were no major accidents reported due to the hoarding. However, realize it or not that hoarding was an important element because it does not only ensure the safety of workers and the public but safety for building materials at construction sites. Provision of hoarding with perfect accessibility and security are also important to avoid any intrusion and theft of building materials [12].

**Fig. 3:** Types of construction accident from 65 DOSH reports in year 2010 to 2013

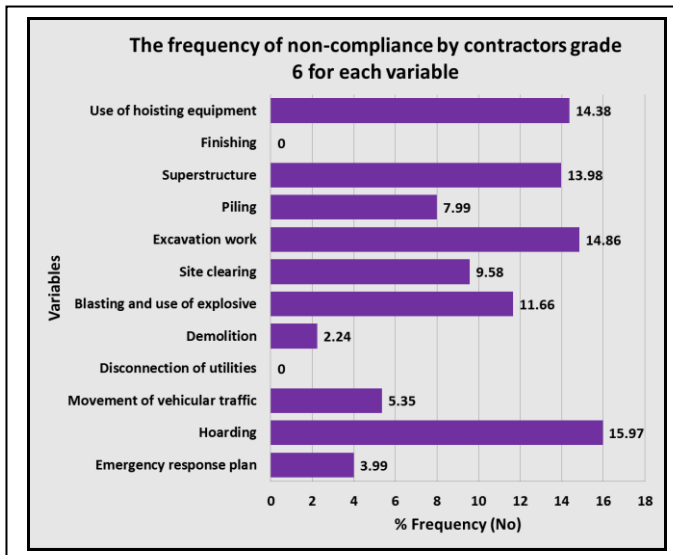


Fig. 4: The frequency of non-compliance by Grade 6 contractors

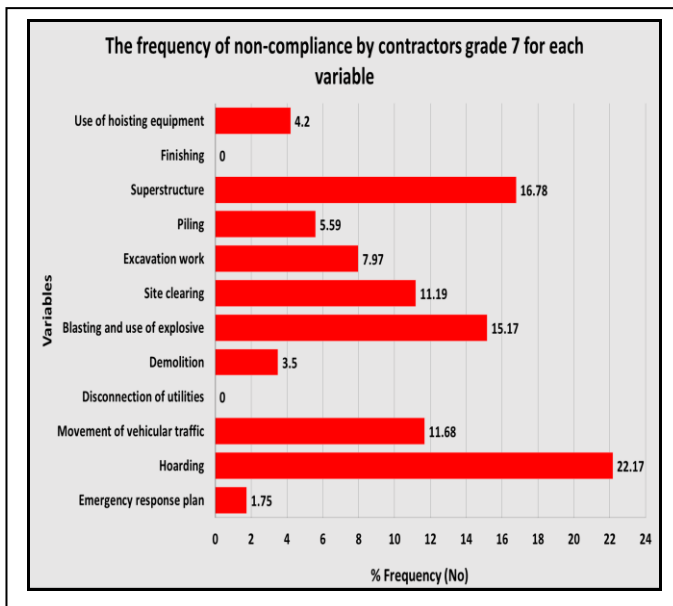


Fig. 5: The frequency of non-compliance by Grade 7 contractors

### C. The Relationship between Types of Accident on Construction Sites with Contractor's Non-Compliance on the OSH Guidelines

By referring to Fig. 6, the radar chart shows the relationship between the first and second objective, namely: types of accident on construction sites and contractor's non-compliance on the OSH guidelines. The label on the outside of the radar represents ranking for the types of accidents gathered from DOSH data. 12 o'clock started as the first position for the type of accident which recorded the highest number of accident cases. The ranking changed in descending clockwise. However, label on the inside of the

radar represents the contractor's non-compliance on the variables stated in OSH guidelines by both contractors.

Based on the results from the radar chart, several mismatches were found where ranking of accident data was not linearly similar with the ranking of observations for non-compliance for both contractors. For instance, hoarding was ranked fifth based on DOSH data, but surprisingly recorded first based on the observations (for both Grade 6 and Grade 7). Thus, in order to obtain more meaningful results, the Spearman's Rho analysis was conducted [15]. It appears that the ranking for non-compliance between both types of contractors outlays 0.76 of strength index. Meanwhile, weak relationship was presented (0.44 of strength index) between accident cases on construction sites and non-compliance on OSH guidelines by both contractors. Hence, it can be concluded that contractors' are prone to non-comply with similar variables, but non-compliance of contractors on OSH policy was not the main contributing factor for accidents at the construction site.

### V. CONCLUSION

Through the data gathered for this study, almost all of the variables directly involved in contributing to the accident at the construction site. Furthermore, finding from the correlation analysis indicate that types of accident and non-compliance of contractors have a weak relationship for a similar variable, at least in the study area. Although the result may not suitable to be generalised to the entire Malaysia, however it shed some light and proves that the construction site is among high-risk area where construction accident rate in Malaysia is on the rise.

To a certain extent, the result also attests that the current OSH policies were still relevant. As comparison, recently the Works Minister, Datuk Fadillah Yusof stressed that negligence of construction workers are the critical reason of construction accident. The statement was made after the finding from specialist investigators hired by the Ministry of Works [16]. In fact, during observations, there are numbers of negligence done by construction workers although the policy was gazetted and enforced; e.g. not using personal protective equipment (PPE) such as helmet, goggle, safety harness, and others. Thus, it can be summarized that the level of compliance by contractors of Grade 6 and 7 on the OSH policy is proved to be unsatisfactory.

Therefore, based on several foundation (i.e. education, training, and enforcement), proactive actions are required to overcome the safety issue in construction sector. All parties with full support of Malaysia government should play their major roles by making sure that they are practicing appropriate and safe working attitude and condition to minimize the accident rates in the construction sites. However, the reality - the goal of 'zero accident' from the construction industry still has a long journey to be accomplished.

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