



**A STUDY ON THE IMPLEMENTATION OF SAFETY PRACTICES IN MALAYSIA  
CONSTRUCTION INDUSTRY**

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## ABSTRACT

Construction industry is one of the industries which has the highest accident rate in Malaysia. Most of the cases happened in construction industry indicate that the industry condition is serious. As a result, implementation of safety practices is needed to improve the current unsafe condition of the construction site which causes an accident and death annually. This study mainly focuses on the implementation level of the safety practices by the construction personnels and its challenges faced during its implementation. The survey through questionnaires and interviews are conducted to obtain all the required information. The questionnaires are distributed through email in West Malaysia while the interviews only involved 10 construction companies in the areas of Penang and Kedah. Based on the result of analysis, it showed that the four safety practices are highly implemented by the majority. Eighty six percent of the respondents implemented that understand of every work activity by the supervisor or site worker in encouraging the safety in designing construction process. Eighty two percent of the respondents has consultation of organization's safety work in site. Seventy eight percent of the respondents identify and improve the weakness of construction safety. Seventy seven percent of the respondents established the planning of construction safety. This allows the construction workers to concern about their responsibility and gain new experience toward their responsibility in ensuring the construction safety. However, the challenge which faced by the majority construction professionals in implementing these safety practices is the tight project schedule in construction project. In order to fasten the construction project, some of the safety steps are skipped or ignored. When the safety steps are ignored, the death and injury are occurred consequently. Besides, lack of safety awareness among the construction workers in their construction project and employers' unwillingness to pay for safety aspects are the challenges faced by the respondents in implementing the safety practices. Hence, several recommendations are provided to improve the current safety practices and the challenges. Enforcement and increasing the current safety training program are required to be conducted by the government and employer as well.

## ABSTRAK

Industri pembinaan adalah salah satu industri yang mempunyai kadar kemalangan yang tertinggi di Malaysia. Kebanyakan kes yang berlaku dalam industri pembinaan menunjukkan bahawa keadaan industri adalah serius. Oleh sebab itu, pelaksanaan amalan keselamatan amat diperlukan untuk memperbaiki keadaan yang tidak selamat semasa tapak pembinaan yang menyebabkan kemalangan dan kematian setiap tahun. Kajian ini terutamanya menumpukan kepada tahap pelaksanaan amalan keselamatan oleh barisan pekerja pembinaan dan cabaran yang dihadapi semasa pelaksanaannya. Kaji selidik melalui borang soal selidik dan temu bual diadakan untuk mendapatkan semua maklumat yang diperlukan. Soal selidik yang diedarkan melalui e-mel di Semenanjung Malaysia manakala temu bual hanya melibatkan 10 syarikat pembinaan di negeri Pulau Pinang dan Kedah. Berdasarkan kepada keputusan analisis, ia menunjukkan bahawa empat amalan keselamatan sangat dilaksanakan oleh majoriti. Lapan puluh enam peratus daripada responden melaksanakan memahami setiap aktiviti kerja oleh penyelia atau pekerja tapak dalam menggalakkan keselamatan dalam mereka bentuk proses pembinaan. Lapan puluh dua peratus daripada responden mempunyai perundingan keselamatan kerja organisasi di tapak. Tujuh puluh lapan peratus daripada responden mengenal pasti dan memperbaiki kelemahan keselamatan pembinaan. Tujuh puluh tujuh peratus daripada responden ditubuhkan perancangan keselamatan pembinaan. Ini membolehkan pekerja-pekerja binaan kebimbangan tentang tanggungjawab mereka dan mendapat pengalaman baru ke arah tanggungjawab mereka dalam memastikan keselamatan pembinaan. Walau bagaimanapun, cabaran yang dihadapi oleh majoriti profesional pembinaan dalam melaksanakan amalan-amalan keselamatan adalah jadual projek yang ketat dalam projek pembinaan. Dalam usaha untuk menyiapkan projek pembinaan, beberapa langkah keselamatan telah diabaikan. Apabila langkah-langkah keselamatan diabaikan, kematian dan kecederaan akan berlaku seterusnya. Selain itu, kekurangan kesedaran keselamatan di kalangan pekerja-pekerja binaan dalam projek pembinaan mereka dan keengganan majikan untuk membayar aspek keselamatan juga merupakan cabaran dalam melaksanakan amalan keselamatan. Oleh sebab itu, beberapa cadangan telah disediakan untuk meningkatkan amalan keselamatan semasa dan cabaran. Penguatkuasaan dan meningkatkan program latihan keselamatan semasa dikehendaki dijalankan oleh kerajaan dan majikan juga.



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## CHAPTER 1

### INTRODUCTION

#### 1.1 BACKGROUND OF STUDY

The construction industry undeniably plays a significant part in the development process of a country as it contributes to the employment and economic growth (Abdullah & Wern, 2011). It is Malaysia's target to achieve the status of developing nations as comparable to United State, Japan and China. After Malaysia obtained its independence in 1957, it has been graced with some skyscrapers. For example, 88 storeys of Petronas Twin Towers in Kuala Lumpur, is the tallest skyscraper recorded in the history Malaysia. On the other hand, Kuala Lumpur Tower stands as a communication tower with advanced technology equipment.

However, the danger at construction sites cannot be ignored (Debrah YA, Ofori G. 2001; Teo AL, Chong FW. 2003). These places are complex, and sometimes hazardous, due to generous use of high-tech machineries. Even though there are some improvements in the safety aspects of construction sites in many countries (A.R. Atkinson, R. Westall, 2010), the rate of construction accidents and death are still high and classed as 'unacceptable' (R. Donaghy, 2009). In Sri Lanka, according to the International Labor Organization, 16.67% accidents and 62.5% deaths occur at construction sites. Besides that, in Canada, the fatality rate is 20.9 in the construction industry (Priyadarshani, Karunasena, & Jayasuriya, Construction Safety Assessment Framework for Developing Countries: A Case Study of Sri Lanka, 2013). The construction industry remains as the most dangerous sector, according to the data of work-related mortality, injury rates, and workers' compensation payments (U.S. Department of Labor, 2000).



It is undeniable the fact that workplace safety is the utmost significant issue (retrieved from: <http://www.safetymanagementgroup.com/why-safety.aspx>). Full attention is required before a project starts, and during the on-going stage of the project. When safety measures are not practiced, a little negligence in the construction process may lead to accidents.

According to Kevin (2012), safety programs should be supported and being committed from the top. Safety communication and focus are required for the management level and communicated to the bottom level, and vice versa. There are many areas where serious concerns are needed, especially the places with poor safety measures including poor housekeeping, negligence for company property and equipment, and poor attitudes and behaviors in the workplace. Besides, employees need to be alerted and updated with information about the work and the risks associated with their work tasks. The responsibilities and rights under a safety program must be understood by the employees. A world class safety program or a world class company has the employees who have richer attitudes on the safety issue.

After getting the agreement of the contract, the design of safety measures is conducted and ensured by the construction personnel that there is no any risk to the construction safety, either for short-term period or long-term period of the construction work. Besides, in order to ensure that the rate of accident can be reduced, understanding of construction personnel about their responsibility to ascertain the construction in a safer environment is important. Furthermore, knowledge and understanding of the safety practices enable employer construction workers to reduce the risk of accident and loss of valuable asset in construction sites. Moreover, a well-designed safety practice is able to increase the proficiency and usefulness of the management system in a contractor organization (Kwayke, 1997).

## 1.2 PROBLEM STATEMENT

According to Hamid, Majib, & Singh, (2008), “The construction industry has a higher frequency of accident occurrence which can consider as a risky industry”. The statistics of accident rate in construction sites significantly revealed that Malaysian construction industry is one of the crucial sectors that require an urgent improvement from the present site safety practices. According to occupational accidents statistics from the Malaysian Society of Occupational Safety and Health, 100 accident cases happened in the construction industry, which is the third highest industry exposed to the accident at the workplace. In addition, the construction industry has shown the second highest of the rate of death, which is 36 death cases happened in other section.

The safety issues are always regarded as secondary or inferior issues in construction (Priyadarshani, Karunasena, & Jayasuriya, Construction Safety Assessment Framework for Developing Countries: A Case Study of Sri Lanka, 2013). Attention and responsibility regarding safety practices are still insufficient among all the parties in construction. Most of the cases happened in construction industry indicate that the industry condition is serious, where it involves the behavior of construction worker, the unstable construction process, and working culture which is not secure, machineries usage and dangerous equipment (Ahmadon Bakri et al).

Behavior and responsibility of the construction organization are one of the factors that reflect about the safety of construction (Hide, et al., 2003). Construction personnel who are irresponsible in performing their construction activities may cause some failures to construction structure. Therefore, this is vital to ensure that best safety practices are directed and followed by the contractor in finishing their responsible project without any unwanted defects, such as cracking, and collapse.

Therefore, implementation of safety practices is needed to improve the current unsafe condition of construction site which causes an accident and death annually. The causes of the poor safety practice record is associated with many issues, such as lack of safety awareness amongst construction workers, tight project schedule and insufficient of safety training duration. Thus, the safety practice performance among the employers

is needed to be polished in the construction workplace. The alarming rate of accident cases whether caused any injuries or death may be diminished if the safety practice is concerned by both the employers and employees.

### **1.3 RESEARCH OBJECTIVES**

The purpose of this study is to identify the implementation and the challenges and improvement of the safety practices in the construction industry. In order to carry out this research, the objectives are identified as follows:

1. To identify the safety practices adopted in Malaysia construction industry.
2. To determine the implementation of safety practices in Malaysia construction industry.
3. To identify the challenges and improvements in implementation of the safety practices in the construction sector.

### **1.4 SCOPE OF THE STUDY**

The scopes of the study are listed as below:

1. This study will concentrate on the safety practices adopted in Malaysia.
2. The targeted respondents are project manager, contractor, sub-contractor and site safety officer for identifying the safety aspect of construction.
3. The methods used to get the data are questionnaire survey and interview.
4. The total number of respondents in answering questionnaire is 60 while interviewed companies is 10.
5. This study will investigate the challenges and improvements in implementation of the safety practices in the construction sector.

## **1.5 EXPECTED OUTCOMES**

Based on the literature review and research plan, the expected outcomes of the study are:

1. The safety practices are adopted in the construction industry.
2. Safety practice which implemented in Malaysia construction industry is planning of construction safety from the beginning phase until the end of construction.
3. The challenges faced by the construction personnel in the implementation of the safety practices are lack of safety awareness amongst construction workers and insufficient of safety training duration.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

In this chapter, the terminologies that related to the construction safety are discussed. These terminologies are important to be understood before the details are explained in the next chapters. The safety equipment is compulsory to be provided by employers to their worker for ensure the safety level of worker. However, the employer reluctant to provide the safety equipment with the reason as increasing the construction cost and their worker will expose to physical and mental danger (Poon & Wong). Therefore, safety planning and management level are required to grant for the construction safety.

Even though safety is an essential aspect which must be practiced and emphasized, it always being ignored until it becomes as a trend. There are some incidents which happened lately had impacted the negative perception in the construction industry nationwide and internationally. One of the incidents was the occurrence of roof collapse after the completion of construction in Sultan Mizan Zainal Abidin Stadium in Gong Badak, Terengganu. It had attracted not only the public attention, but it caused construction working quality to be questioned and becomes as a public dispute. The questions had arisen toward the concern and responsibility of construction personnel in completing particular project. (The Star, 22 December 2009).

## **2.2 TERMINOLOGIES**

Some of the terminologies used are discussed as below.

### **2.2.1 Safety**

According to Oxford Dictionary (2013), safety could be defined as a condition which was protected or avoided from disaster, escape from the danger and did not get any disturb. Besides that, Pejabat Buruh Antarabangsa (1990) also defined safety as something which all the involved activities were covered in the development and implementation of the programs in encouraging the safety, prevention action and identification of danger and risk in the workplace.

### **2.2.2 Hazards**

“Occupational Safety and Healthy Assessment Series, 18002” (OHSAS 18002) and (ISO/IEC Guide 51:1999) defined hazard as a cause or condition which caused the harm potentially in the context of hurt and disease to human, damage of property, damage of the working environment or both. The examples of hazard were chemical, radiation, electricity, Biohazard and unsafe working system.

### **2.2.3 Risk**

Risk was the combination of probability and result of certain risks incident happened. Risk also could be defined as the combination of probability factors happened a tragic incident, and impacts of certain accident (OHSAS 18002). This meant that the probability of the happened accident. Statistic of accident could be used to determine the probability.

#### **2.2.4 Dangers**

The danger meant the relative exposure of someone toward a hazard. Guidance ISO/IEC 51:1990 suggested that “danger” was used for determining the condition which had a higher risk. Some of the risky conditions at the construction site are as follows:

- Defect of scaffolding or incorrect construction of scaffolding
- Defect of forklifts or irresponsible operator
- Dropping of load due to the evacuation of improper load or careless
- Tripping or fall due to messy workplace
- Dropping of structure
- Injury due to the improper use of machinery (welding rod, electrical apparatus) or negligence

### **2.3 SAFETY PRACTICES PRINCIPLES IN CONSTRUCTION**

In order to implement the safety practices in construction, there were six principles of safety practices to be directed. These principles were anticipated to operate at a construction industry level as broad values for adoption at both corporate and project level (Lingard et al., 2006). The best safety practice principles were as below:

- i. Principle 1: Establish the leadership of safety in construction
- ii. Principle 2: Encourage the safety in designing construction process
- iii. Principle 3: Communicate with all the parties
- iv. Principle 4: Reduce the safety risk
- v. Principle 5: Improve the performance of construction safety continuously
- vi. Principle 6: Strengthen the performance of construction safety

The understanding of those six practice principles was important that it enabled employers to be aware of their responsibility that in accordance with the construction. In order to conduct in this study, out of these six practice principles, only first four practice principles were covered and described as below:

### **2.3.1 Principle 1: Establish the Safety Leadership**

Safety leadership involved the sharing or communication with all the parties involved regarding to the importance of safety in the construction project. In a real context, construction safety issue was not always followed the construction safety carter and plan accordingly (The UK's expert provider of custom essays). Therefore, safety leadership was important for featuring and starting from the top management down to lower level, including all the construction workers. Responsibility in producing a safer construction shall become as an aim, and together with strategy, objective and suitable safety planning in order to achieve a satisfied achievement. There were some components which are carried out by the employer to foster safety leadership and have shown as follows:

- Demonstration of management responsibility
- Evaluate the project safety implementation stage
- Construction site safety checkup
- Consultation and discussion about safety

The involvement from a contractor in safety program mirrored out the importance and understanding by all parties involved regarding to construction site safety in a construction project (Eggn, 1998). Indirectly, the information about the importance of construction safety was presented to sub-contractor, architect, and client clearly. Since contractor personnel were the responsible parties on construction safety, client and architect should assist contractors in the implementation safety program. This could be carried out by having the involvement in construction safety training programs and meeting. Moreover, the involvement of client, architect and management parties in the project revealed that the safety and welfare of construction project was emphasized by all the construction personnel (Emmons, 2006).

Before starting a construction at the construction site, the specific safety planning was well prepared by the contractor (Retrieved from: [http://www.deir.qld.gov.au/workplace/industry/construction/documentation/whs-management-plans/index.htm#UplNiZKVO\\_U](http://www.deir.qld.gov.au/workplace/industry/construction/documentation/whs-management-plans/index.htm#UplNiZKVO_U)). The information which was regarding



to construction laws based on project site was contented in the safety planning documents. In order to have a better construction safety plan, all the relevant information was given by the client and architect to the contractor.

The safety plan was suited to the construction method used by the contractor, professional level of site labors and equipments used on the construction site (Guidelines for Preparation of Health and Safety Plans). The contents of the construction safety plan were listed as below:

- Responsibility of construction safety management
- Clear information about the sub-contractor management
- Resource allocates for safety management
- Procedures to report site safety

By implementing the safety plan at the beginning of the construction phases, the safety development throughout the project could be emphasized.

One of the construction planning activities was construction site safety checkup (Hunt, 2013). Construction site safety checkup was essential to be carried out in order to ensure the safety of the construction site. The data about the construction safety required to be inspected and any doubt about the safety should be discussed with the top management. As a result, doubt in the construction process could be reduced.

An example of the safety implementation planning activity was “safety walk” (Safety Inspections, 2009). In other word, it was a “spot check” which carried by employer for ensuring the safety practices was implemented properly. Besides that, it required to follow the safety charter. Furthermore, it should be carried out continuously all the time. This action was taken so that the contractors were able to realize their responsibility and management parties in ensuring the construction safety. The evaluation was conducted in order to identify the weakness which may occur during construction. Therefore, the weakness was reduced and resulting some of the positive impacts on the construction safety.

In order to ensure that the construction safety was obeyed, the employers were required to consult with all the involved workers regarding to the implemented safety in the construction site and this consultation was conducted continuously during the construction process (Work Health and Safety Consultation Co-operation and Co-ordination, 2009). The proactive actions which were taken by the contractor for consulting with the staffs were as below:

- Providing them the freedom of voicing out so that they feel they are respected. This would encourage them for ensuring the site safety.
- Consider every opinion which provided by them. This is because they able to help the employer in making decisions which regarding to safety.
- Deliver the construction safety information by ensuring their understanding on every essence.

### 2.3.2 Principle 2: Encourage the Safety in Designing Construction Process

In order to minimize the structural safety risk, an effective safety management in designing construction work was required (Safe Design of Buildings and Structures, 2008). For example, usage of suitable materials and carried out related tests in ensuring the working way essential, so that there did not have any side effect to the building structure. There were two methods to encourage the safety in designing construction:

- Develop the safe construction method
- Supervisor and labor understand the construction activity

A safe construction method indirectly was able to ascertain for a safer construction. The comprehensive systematic method and working way should be conducted in every construction process. The construction method was suited to the type of structure built. Allocation and requirements in construction was obeyed by every construction personnel in completing a project. This was important that the construction standard was able to fulfil the standard which has been set by the government agency.

Before implementing a safer construction, safety in the construction method was ensured by the construction personnel for minimizing the risk of the project (Eggn, 1998). These included:

- Effect of construction toward the stability of the building
- Testing toward the strength of used materials in construction
- Ensuring that the loading carried by the building is safe and fulfill the construction requirement
- Create certainty with building design regarding to the loadings carried by the structure for a long term period.

One of the best actions for ensuring construction safety was developing the construction safety consultation committee in site (Safe Design of Structure, 2012). Besides having the supervision of the working method of every worker, some advice and opinion should be provided. Any problem or doubt which happened on the site should be stated or discussed with the committee members during site meeting.

Understanding toward the right working method was important for ensuring the construction was safe (Bircham Newton K. L., The Construction (Design and Management) Regulations 2007 Industry Guidance for Principal Contractors, 2007). The contractor ensured that every process ran in site was understood by every worker. Work practicing program was one the important steps for training and delivering the information regarding the correct method to the workers. And this allowed the worker to gain new experience toward their responsibility in ensuring the construction safety. The right advice and suggestion were given to lower level, especially the unskilled young workers.

### **2.3.3 Principle 3: Communicate with All the Parties**

Communication and consultation of safety practice in an employment were vital in safety management (Work Health and Safety Consultation, Co-operation and Co-ordination, 2012). In construction projects, information regarding construction safety was shared or exchanged among all the involved parties in a construction project. Open dialogue among contractor and other involved parties was remained during the construction process. There were 3 components which employers should emphasize and listed as below:

- Construction safety communication
- Feedback about the construction safety
- Safety consultation committee

Discussion and communication of construction safety issue were conducted as early as possible (KSC Construction Contractor Safety and Health Practices Procedural Requirements, 2011). Through the discussion, information about construction safety was able to be delivered to all the parties. Besides, every construction personnel's role was clarified and specific in the construction project. Furthermore, all the involved parties were required to give their opinion toward the construction safety issue. As a result, a safer work was able to be delivered in order to guarantee for better quality construction property.

Every change happened in the design of the building during the construction process was reviewed (Guideline on Risk Assessments and Safety Statements, 2006). The review was able to assist contractor for design the construction concept which was safer from time to time. Besides, this was important to remind the contractor and other construction participants about the importance of the safety in completing a construction project. Implementation of construction safety was become as the important agenda in project meetings and latest information about the construction safety issue was recorded in the meeting minute.

Safety issue regarding to construction was become a main issue in the bulletin where the employer ensured that bulletin was distributed in the appropriate places (Howe, 2007). So that, the essence which want intended to convey was obtained by all the parties. Besides that, the content of the bulletin information was shown as below:

- Outlines the best practice for construction safety.
- Display the individual name who implements that practice
- Suggestion for overhauling the construction safety issue.
- Display the incidents which happened due to irresponsible attitude

#### **2.3.4 Principle 4: Reduce the Safety Risk**

Safety risk management was one of the prevention steps to reduce mistakes in construction. Systematic management will help to reduce the safety risk (retrieved from: <http://www.hse.gov.uk/construction/healthrisks/designers.htm>). When safety risk was not able to be avoided, method to reduce risk was considered. The methods were mentioned as below:

- Ensure that the hazard which gives the main risk to construction safety to hazard which is low risk
- Reduce the engineering safety risk by having the correct work process
- Provide staff with the appropriate apparatus for the construction process
- Ensure that they have the knowledge, skill and ability

With these prevention steps, the construction work was performed by employee safely where their critical aspect was to ensure the construction safety well (Guideline on Risk Assessments and Safety Statements, 2006). Information about construction safety was recorded and given to those who exposed to risk in working. Any information needed about construction risk was become as an input for ensuring the construction safety (retrieved from: <https://www.osha.gov/doc/outreachtraining/htmlfiles/osha2254.html>). Therefore, some practices can be carried out to reduce the risk and are listed as follows:

- Identify and overcome the weakness
- Record the construction safety risk
- Reduce risk systematically

Once the weakness in safety management was identified, some improvement steps were taken. This was to avoid the problem arose toward the output in future. For example, cracking happened in construction, contractor was required to look seriously at this matter as a small cracking could cause a big problem toward the strength of the structure of the building. Immediate actions were taken to solve this problem. Any safety problem in construction was recorded and referred to the top. Appropriate action was taken and followed up from affected construction safety (Safe Design of Structure, 2012).

Requirement of safety risk management in systematic, effective and efficient manner was a must (Safe Design of Structure, 2012). This was because the future risk encountered was able to affect the overall construction outcome. Good safety risk management was the best key practice to be practiced. Use of information technology in construction safety was one of the shortcuts to implement safety practices (Al-Hamad, 2011). A good risk management was not only mirror out that the positive attitude of the contractor, but the impressions of the organization was praised as well. Establishment of construction safety committee in the beginning phase was one of the best steps where construction safety information was shared with the construction workers and recorded in the risk assessment document for the future survey.

## **2.4 CHALLENGES IN IMPLEMENTING CONSTRUCTION SAFETY PRINCIPLES**

### **2.4.1 Employers' Unwillingness to Pay for Safety Aspects**

Most of the employees were unwilling to paying attention on safety management (Poon & Wong). As a result, this responsibility had been transferred to the contractors. In addition, competitive bidding was another factor which happened among the developers. In order to compete for lower bids, reducing the cost of the construction project was commonly happening among the developers. Consequently, safety measures in construction were affected or reduced when the employer was unwilling to pay for it.

### **2.4.2 Tight Project Schedule**

Since the probability of serious accident was not high and the breach of contract payment in the case of late completion of a project was far more than the losses in the event of accidents, therefore employers usually took risks on it (Poon & Wong). In order to fasten the construction project, some of the safety steps were skipped or ignored. When the safety steps were ignored, the death and injury were occurred consequently. Besides, they assumed that there was no serious accidents occurred when risk was taken. In this conceptual case, completion of a project within the duration was more importantly than considering the safety aspects of construction site.

### **2.4.3 Lack of Safety Awareness amongst Construction Workers**

The inconveniences which most of the construction workers faced were wearing the safety boots, safety jacket and helmet. These inconveniences caused many construction workers did not adopt safety measures. In addition, adopting safety measures in construction site symbolized that they were unskilled workers (Poon & Wong). Besides, uncooperative attitudes and behaviours prompted that most of the construction workers did not put on their personal protective equipment (Dedobbeler N, Beland F.,1991). On the other hand, this meant that the construction workers required to