

# AN IMPLEMENTATION OF SAFETY MANAGEMENT SYSTEM TO ENHANCE SAFETY LEVEL IN CONSTRUCTION INDUSTRY

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## ABSTRACT

*The construction industry is considered as one of the most hazardous industrial sectors that a large of percentage of workers will be prone to the accidents while the construction project is carried out. So, safety and healthy plays an important role in the construction industries. Each construction project is unique with site-specific issues. Hazards and exposures change daily. There are numerous contractual arrangements, such as design, build, multiple or single prime contract, or construction safety management that can affect construction site safety responsibility. Many projects have multiple prime contractors and possibly owner-employees working in the same area with responsibilities not always clearly delineated. This paper review information about safety and health issues in construction industry and some common safety problems which include lack of safety regulations and standards, lack of safety training to worker, lack of competent worker, low priority of safety and lack of the documented and organized safety management systems. This project aims to get a best safety management system in construction industry for a safety environment to enhance safety level in construction industry.*

## Keywords

*Construction industry, safety, safety management system*

## 1.0 INTRODUCTION

Construction industry is one of the major industries in the world. Achievement for construction industry is in rebuilding areas and to achieve the needs and expectations of people in the world by providing services, communications and power with the peoples in the world. However, continues growth of construction industry has comes many problems in the site of safety and health. The safety record for construction industry has always been poor; it is one of the most dangerous industries to work. Many accidents have occurred in

construction industry and some accidents are not reported and not detected. The rate of accidents in construction industries has exceeded those in other manufacturing industry. Most construction workers are injured killed and suffers ill-health than in any other industry. There are high rate of accidents in construction industries, it is because the high turnover of workers, the many different trades and occupations, exposure to the weather, large number of seasonal and migrant workers and many of them are unfamiliar with the construction process, the variety and comparatively short life of construction sites and the high proportional of small firms and of self-employed workers.

This project is reporting about the safety and health in construction industries. How the safety management systems affect the safety level in construction industry? Besides that, this report also reporting about information about safety and health issues in construction industry and some common safety problems which include lack of safety regulations and standards, lack of safety training to worker, lack of competent worker, low priority of safety and lack of the documented and organized safety management systems. The objective of this project is to improve the safety and health standards by safety management system. It also reduces the accidents that occur in construction industries and research help to reduce the impact of worker's safety and health.

The purpose of this study is to study about the methods take in site of safety management system to ensure that all of workers in construction industries are safe and condition in construction site will not cause accidents that will damage to life, health and professional skills.

## 2.0 LITERATURE REVIEW

The literature review will be discussing about the safety management system in construction industry from all aspects and aspects that must be focus to contribute a safe working environment.

## **2.1 Safety management system**

### **2.1.1 Definition and overview**

Safety management is a one of the method to achieve a safety and health site in construction industries. It will inform workers and supervisors of a proper safety management system. Governments, employers or workers play an important role to improve safety and health in construction industry. Safety management involves the function of planning, identifying problems, coordinating, controlling and directing the safety activities at the work sites to prevent accidents and ill-health. Safety management means applying a safety measure before accidents occur and there are some objectives of safety management which are to make environment safe, make the job safe and make the workers safety conscious.

### **2.1.2 Safety policies**

Safety policies is important, employers need to write a safety policy for their enterprise by setting out the safety and health standards. A senior executive can be choose to seeing and follow up to achieve the standard of health and safety. There is some safety policy that should deal, for example, training should be arranged at all level. Key workers such as scaffolders and crane operators need given particular attention to those whose mistakes that can cause dangerous to other workers. The workers should be involved in their preparation of safe methods or systems of work for hazardous operations before carrying out the operations. Besides that, the duties and responsibilities of supervisors and key workers is also one of the safety policies. Arrangement of information on safety and health is to be made known and arrangement for setting up safety committees. The selection and control of subcontractor is also a safety policy.

### **2.1.3 Safety organization**

One of the elements of safety management is the designation of individual with responsibilities and accountabilities in the implementation of the construction safety programmed and plan. The organization of safety on the construction site will be determined by the size of the work site, the system of employment and the way in

which the project is being organized. Safety and health records should be kept which facilitate the identification and resolution of safety and health problems on the site. There are some safeties and healthy duties that should be assigned to certain peoples for example, provision, construction and maintenance of safety facilities such as access roadways, pedestrian routes, barricades and overhead protection; construction and installation of safety signs; safety provisions peculiar to each trade; testing of lifting machinery such as cranes and goods hoists, and lifting gear such as ropes and shackles; inspection and rectification of access facilities such as scaffolds and ladders; inspection and cleaning of welfare facilities such as toilets, clothing accommodation and canteens; transmission of the relevant parts of the safety plan to each work group; emergency and evacuation plans. Safety organization also separate into few part which are safety officer or manager, supervisors and workers.

### **2.1.4 Safety committees**

Safety committees are a great way to prevent accidents. The duties carry by safety committees includes regular and frequent meetings to discuss the safety and health programmes on site and to make recommendations to management; consideration of reports of safety personnel; discussion of accident and illness reports in order to make recommendations for prevention; evaluating improvements made; examination of suggestions made by workers, particularly by safety representatives; planning and taking part in educational and training programmes, and information sessions.

### **2.1.5 Safety representatives**

The function of safety representative are to make representations to the management about matters of concern regarding the safety and health of workers; to attend meetings of the safety committee; to carry out regular and systematic inspections on site; to investigate accidents in conjunction with management to determine their causes and to propose remedies; to investigate complaints by workmates; to represent workers in discussions with government inspectors at their site visits.

## 2.2 Site planning and layout

### 2.2.1 Site layout

Site layout that is badly planned and untidy is one of the reasons that cause accidents. It can cause falls of materials and collisions between workers and plant or equipment. So, the site layout must be planned properly by arrange the storage areas for materials and equipment, location of construction machinery, arrange route for vehicular traffic, location of medical and welfare facilities, location of trade workshop. Artificial lighting at place where work and site security must be takes care too. Besides that, there is also a need to arrangement to keep the site tidy for the collection and removal of waste, and a need of low voltage electric power supplies for temporary lighting, portable tools and equipments. Training must also need for workers and supervisor.

### 2.2.2 Site tidiness

Site tidiness must be given attention to contribute for a safe working condition. There are many accidents that occur due to trapping, slipping or falling of materials or equipment and step of nails which have been left from timber. There are few progress that need to take to make sure the site tidiness which are clean up the rubbish immediately, clean up spilled oil and grease, remove or hammer down nails from timber, and deposit waste materials at a recognized disposal point.

## 3.0 METHODOLOGY

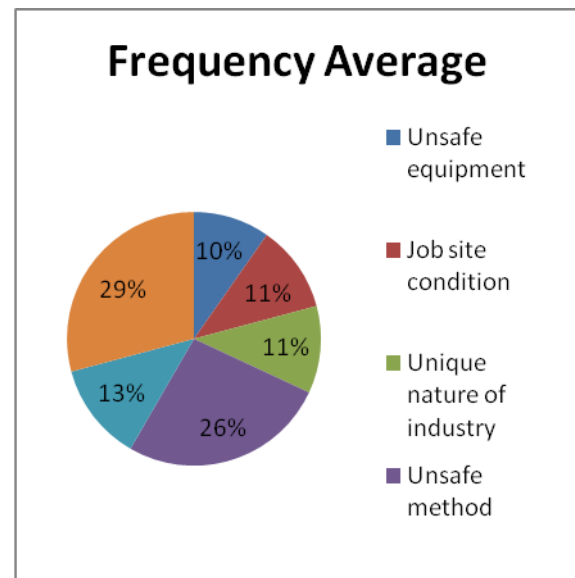
This chapter discusses about the methodology methods that use to get the data in this research of this project. The secondary data collections are the main method to get the information to complete this project report. The analysis is done by getting the data collection from the resources from the internet which are web, news, journals or articles. The data that collected must be useful and match up with the title that I do in this project report and must fulfill certain standards and requirements that meet the specification of good data. Besides that, it must be a real fact that happening in the world nowadays. In this research, it is conducted study on safety and health issues in construction industry and how a safety management system to enhance safety level in construction industry.

## 4.0 ANALYSIS DATA

Analysis, discussions, conclusions and recommendations are comprised in data analysis. All the information and data are obtained through the journal, books and also resource from internet that was analyzed to produce the results. Results of the study that we viewed will compare by preparing the most of important problems.

Based on the data that we search through the internet, the data are showed the distribution of causes of construction accidents from DOSH reports in Malaysia. There are 6 causes of accidents such as unsafe equipment, job site condition, and unique nature of industry, unsafe method, human element and management.

Causes of accidents	Frequency Average	Percentage%
Unsafe equipment	7	9.7
Job site condition	8	11.1
Unique nature of industry	8	11.1
Unsafe method	19	26.4
Human element	9	12.5
management	21	29.2

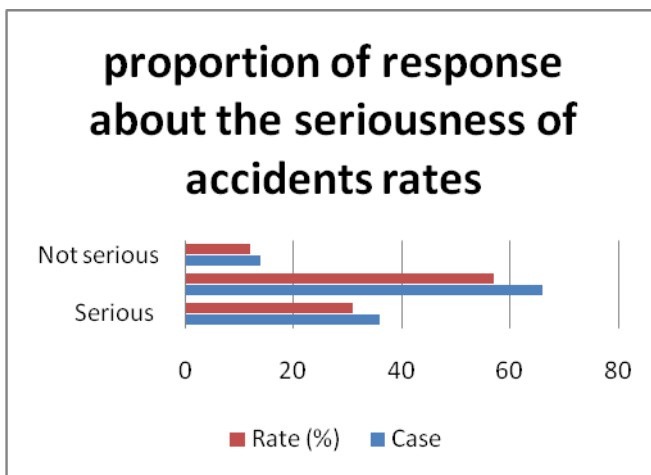


The result was obtained by 128 accidents from DOSH report from year 2000-2004. The analysis show that the causes of construction accidents on average are mainly attribute to the management (29.2%). There are poor safety policies, lack of safety education system, poor inspection program. Second major causes are unsafe method (26.4%)

that related to incorrect work procedure. The unsafe equipment (10%) is a poor site management. But it also has plays a roles in contributing the causes of accidents.

Besides that, we also find the statistics of proportion of response about the seriousness of accidents rates. We find about that the serious case has 36 cases, moderate case is 66 cases and not serious case is 14 cases.

Seriousness of accident	Case	Rate (%)
Serious	36	31
Moderate	66	57
Not serious	14	12



The accidents at construction site are common and it occur daily such as stumbled, fallen objects, fallen from height and others. As result of injuries, that may cause to unawareness of workers on important of safety support that can reduce potential danger. Providing safety support is necessary to prevent severe accident there are wearing safety harness, wearing helmet, give safety training to worker, organized the safety management system and so on. Wearing safety harness can protect workers falling off from heights. It is very important and workers will feel secure working on certain height. Wearing helmet is to protect the head that from the falling objects from height. Wearing safety helmet put workers in safer condition. Based on ILO (1989) wearing safety helmet prevents head injuries. It must especially for those they are working in hazardous place. We must give safety training to worker to prevent the accident happen in construction. Safety training plays an important role in construction. Safety training give knowledge to workers that how to prevent accident, how to protect themselves when working. Safety management system also plays an important role in construction. The good

safety management system will change the construction industry to a safety environment.

In other cases, it is ineffective safety management system. Based on case study on Batam Polytechnic Project, the contractors have implemented safety practices and safety improvement that are according to the priority of safety policy. For example are providing safety support (using harness, gloves), work instruction and planning (instruction manual, verbal instruction), workers education and training program (utilizing of safety equipment training), workplace security systems (fences around project) and others. The safety improvement such as communication and appreciation (a good communication in safety management), quality record of safety and health management (establish standard form of Quality Record Regarding to Safety and Health management), supervisor capability improvement (training program to increasing supervisor's capability in executing work program).

The lesson that we learned is due to ignorance, indiscipline, and lack of knowledge, lack of training, lack of safety equipments, and lack of management commitment.

## 5.0 DISCUSSION

Based on the results from the all information and data are obtained through journal, books, and internet resources, we can see some of the things associated with this construction safety such as factors that impact the consideration of safety.

One of the biggest problems with the construction today is knowledge. There are so many construction workers out there building projects, which really don't have enough education, skills or work experience behind them. There is means that there is lack of safety and health training programmes in the majority of the companies. Informal briefings are generally used instead of formal training programmes. Most of the workers experienced an accident in the past. Falls are the main causes of construction accidents. Poor attitude toward safety, unsafe site conditions and lack of knowledge and safety training are the most important factors causing accidents. There was no properly training to an employee in recognizing and avoiding job hazards. For the example, a new employee is sent up to work on a sloped roof without being trained on the proper use of the fall restraint system and ties off to a deficient anchor. Based on the problems, workers need to be learn about common safety hazards and safety problems at worksites, their right to be work in a safe environment, and also they are able to claim their

injury against accidents at their work place. Education and professional training needs should be focused on the company management based on safety regulations, safety management systems, and their requirements and benefits. Education for a new worker consisted of the followings: making employee understand workplace's condition very well, teaching him about the location of dangerous spots, safety facilities, and safety plans, preventing him from walking alone, accompanying someone for few days until he felt well familiar with the workplace and specifically giving him instructions to each work as well as general instructions at every meeting. The companies also have to focus more on formal training programmes regarding safety and health practices to reduce the percentages of construction accidents. Moreover, the companies can make an interaction with the worker's and control their behaviors towards safety and health practices. This can help to improve their attitudes towards safety issues.

After that, safety management problem can be considered as the important attributes to poor construction site safety. Many employees and workers continue involved in the accidents due to lack of safety management on construction sites. The employees and workers also face their healthy problem and long-term illness caused by their work. These injuries, deaths and illnesses can and should be prevented by implementing the safety management. Project managers and their managers in the different level as well as business professional usually have a limited understanding of their obligations relating to construction safety management principles and practices. There are no theory pertaining to construction safety management such as to introduce a range of tools and techniques representing best practice in the management. Actually the employees and workers should be understood the concepts, tools, and techniques to preventing themselves to injury in their workplace. Special attention should be paid to informing and training workers when the new products, methods of working and equipments are introduced due to some objectives such as to give employees and workers a broad introduction to the subject of construction safety management to manage operation on construction sites, to motivate the employees and workers to use their acquired knowledge to complete their projects effectively and efficiently by following strategy of reducing the risk and hazards in workplace and with SOP of safe procedures as well as safe operation of work places. Plan techniques are also very useful in reducing the percentages of accidents among the workers. The construction safety planning supervisor is able to review the safety-oriented plan of the works written early by the design safety planning supervisor. Indeed, he has knowledge of

the plans provided by contractors and subcontractors during the bidding and awarding stage.

## 6.0 CONCLUSION

Our study concludes the common safety problems which include lack of safety regulations and standards, lack of safety training to workers, lack of competent workers, low priority of safety and lack of the documented and organized safety management systems. A basic knowledge of the general risks arising from construction work should be spread for everyone who works in the industry to protect their own health and safety and understand about how the effect could have on others caused by their actions. This is very important for those who will regularly visit or work on construction sites. After have gaining this basic knowledge and understanding, workers should then receive regular updates and more specialized training as part of a life-long learning process. Then the percentages of the workers killed or injured in the construction sites can be reduced by automatically.

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APPENDIX

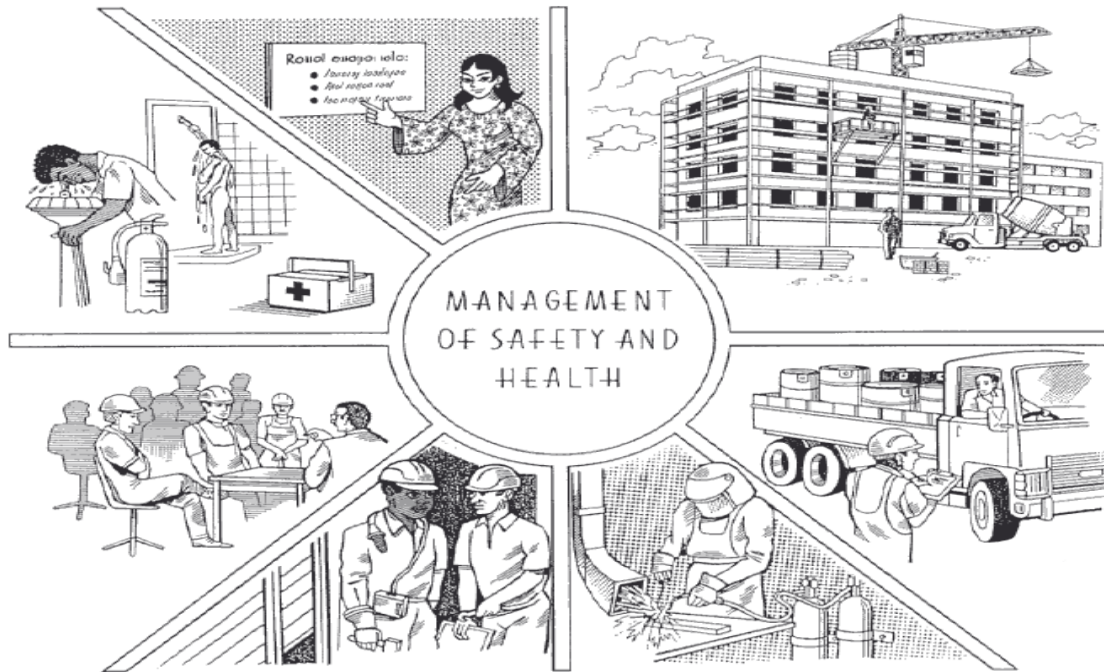


Figure 1. Safety management system

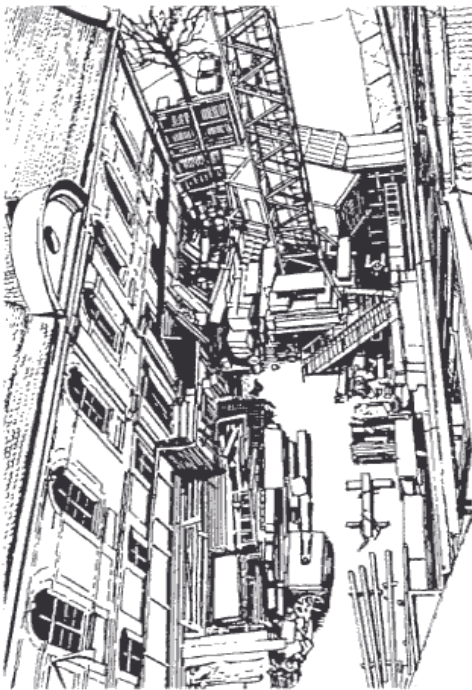


Figure 2. Bad layout

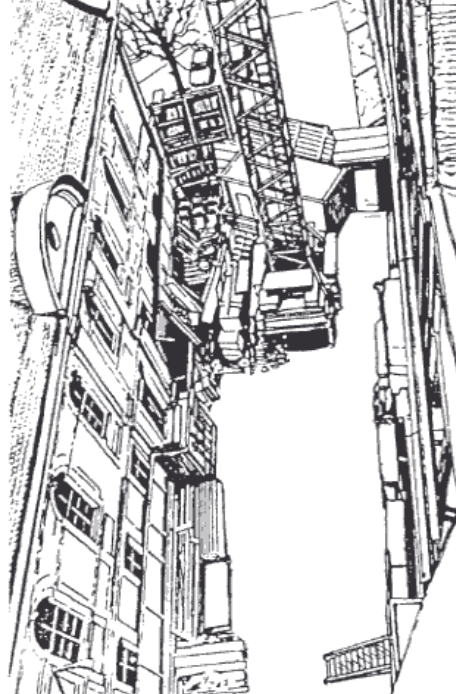


Figure 3. Good layout



Figure 4. Edge protection

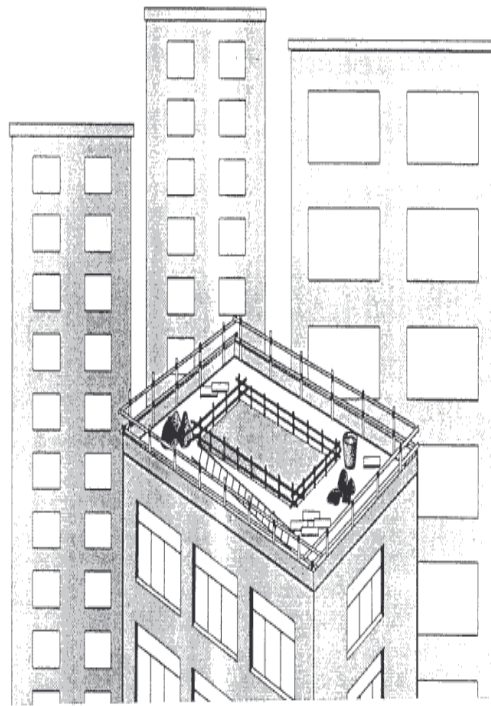


Figure 5. Edge protection for flat roof

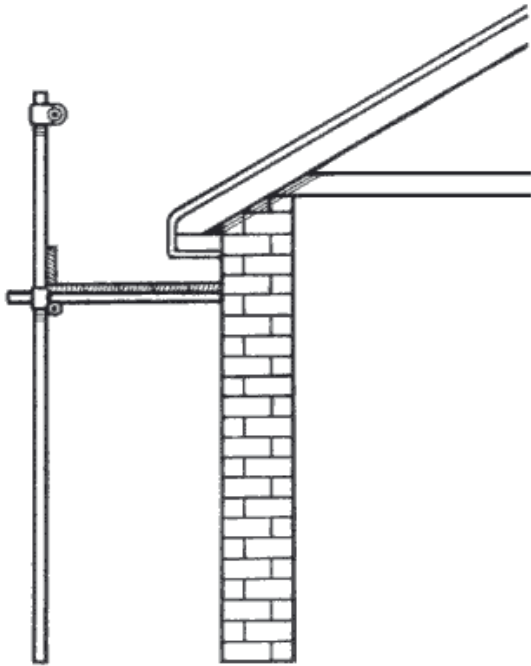
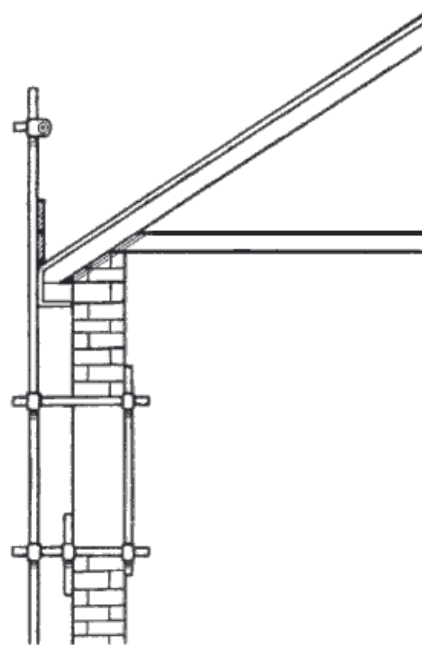


Figure 6, Edge protection for sloping roof





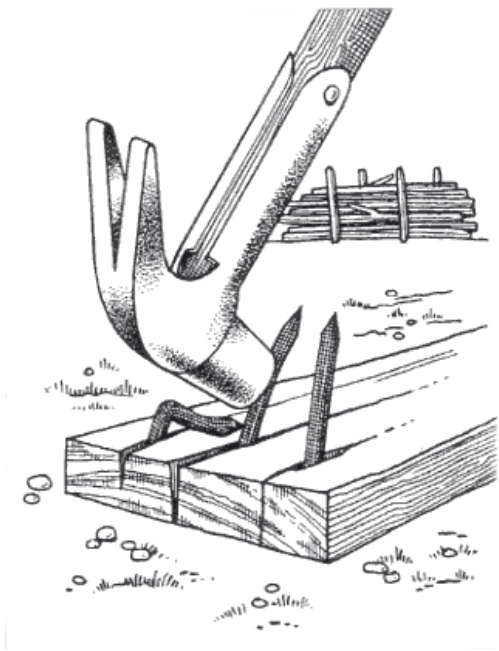


Figure 7. Hammer down nail from timber



Figure 8. Clean up split oil or grease