

Investigation the Safety, Health and Environment (SHE) Protection in Construction Area

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Abstract - *The construction industry involves risky and unhealthy operations which result in many human tragedies, discourage workers, disrupt construction, delay progress, and adversely affect cost, productivity, and reputation. Construction managers focus mainly on productivity in terms of cost, quality, and time. Construction project can never achieve its objectives unless construction professionals become aware of the safety-related issues. Workers working in the construction industry are incessantly bared to unsafe working conditions and have to confront several kinds of hazards. This embraces exposure to sound, dust and toxic substances, issues of ergonomics, stress etc. Every construction should involve in safety practices to reduce injuries in their respective sites. Workers behaviour is an extremely important factor in workplace safety as many accidents are often caused by insecure actions, in which combinations of human behaviour are the consequence of such perceptions. The Occupational Safety and Health Act were passed in 1970 to protect employees by stating that employers have a legal obligation to provide their employees with a safe working environment safety protection in construction area. This is especially important in construction, as there are a number of hazards and risks to site workers that are experienced every day. All parties with full support of Malaysia government should play major roles and responsibilities by making sure that appropriate safety practices are carried out to minimize the accident rates in the construction sites. Accidents in construction sites are unplanned occurrence involving movements of person, objects or materials which may result in injuries, damages and losses to properties or human. The majority of accidents happen as result of unsafe acts and unsafe condition. Since all hazards in construction are not always possible to be identified and eliminate therefore*

through effective accident investigation, construction accidents can be prevented just by identifying the main root cause of those accidents. The main objective behind this paper was to create awareness among construction workers about various safety-related protections in the construction industry.

Key Words: *Safety, Construction, Protection, Hazards, Accidents, Fatal, Injuries, Death.*

1. INTRODUCTION

Safety, health and environment are concern with protecting the welfare of the workers in their respective work place. Safety is very vital in construction industry because it is a high hazard industry that consists of residential construction, alteration, repairing, bridge erection, roadway paving, excavation, demolition, waterproofing, large scale painting commissioning, de-commissioning, dismantling, and fitting out. The main force behind any construction site is the man power. Without safety, the risks and hazards at a very dangerous place like this can get people injured, hurt or even killed. This can cause any construction site delays, extra expenditures and of course loss of man power. Health and safety is a very important role in a job as it is very important that they keep to regulations so the business doesn't get closed down. Also health and safety protects the employees and the employers and tries to keep everyone safe. Health and safety is one of the tools that they have in making sure that a company achieves success. They can't get a good outcome if their employees are getting sick and hurt all the time. Protections against the safety health and environment in construction is the prime right of labourers, yet for years construction workers have been struggling to attain this right and many of them have lost their lives.

In construction setups, health, safety and environment (HSE) departments address work-related or occupational safety issues. The main problem in construction regards to work-related safety is that people don't know much about it due to which work-related safety issues are not on the government's list of priorities, although the number of work-related deaths in construction sites is much higher than the number of work-related deaths in other sectors. A probe into the safety management system suggests that the current practise in Malaysia does have sound features and characteristics. However, it lacks the mission, vision and objectives of safety management system as well lack of awareness and drive for the realization of safety among management executives due to over-emphasis on productivity. It also requires more constructive and practical ideas towards safety management implementation. In contrast to the existing scenario, the quality practice in Malaysia is more developed and established in which the control measure can be seen from the enforcement of various guidelines, implementation of quality management and the establishment of specific body to monitor activities relating to quality management topic. Knowing the fact that improvement is vital and needed, a framework of safety management is formulated and adopted based on the intention of achieving quality construction. An integration of safety management and quality on brings forth a more comprehensive approach on safety practice whilst at the same time providing a quality construction. The term 'safety management' actually is used for convenience and for shortness, and wherever it is used it should be taken to refer to the management of occupational health and the environment as well as safety. Safety management is concerned with, and achieved by, all the techniques which promote the subject. In addition, safety management is also concerned with influencing human behaviour and with limiting the opportunities for mistakes to be made which would result in harm or loss.

The construction industry is a high risk industry because there is a high risk of accident occurrence. 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 complete accident prevention policies but instead concentrate on maximizing profit. They do not emphasize on safety because they do not know how high the actual cost of an accident is until it occurs. The statistics of accidents occurred in the construction industry indicate that the accident rate in Malaysian construction industry is still high and it give us a picture that construction industry is one of the critical sectors that need a huge and fast overhaul from the current site safety practices. In order to prevent an accident, preventive measures must be taken. In order to prevent accidents, one must know the causes of accident, more specifically the root cause of accidents.

The aim objective of the study is to investigate the causes of accident at construction sites in Malaysia. The main objectives of this paper are protecting safety health and environment in construction area. A construction safety plan is a document that outlines the safety precautions that will be taken during a specific project. The construction safety plan is important to protect the workers and the public from injury or harm. In general, this paper divided into five sections which are section I explain about the introduction of SHE, while section II is the literature review to review the previous study of SHE. Section III is the case study and data analysis in construction area and section IV is the finding and discussion. The conclusion of this research summaries in section V about overall this research.

2. LITERATURE REVIEW

An accident can be defined as an unplanned, undesirable, unexpected, and uncontrolled event. An accident does not essentially result in an injury. It can be in term of damage to equipment and materials and especially those that result in injuries receive the greatest attention [1]. All accidents, regardless of the nature of the damage or loss, should be of concern. Accidents that do not cause damage to materials or equipment or injury to personnel may predict future accidents with less desirable results. Whether working with a table saw, climbing scaffolding or lifting drywall, those who work in construction are often put in potentially dangerous situations. To stay safe on the job site, it is important for construction workers to understand what safety issues are common in their line of work. There are many types of construction accidents, and they can be classified by different categories. In terms of severity, a construction accident may or may not cause injuries and life loss, and the economic loss may be small or huge. A construction accident can be rooted in equipment failure, design ignorance, working carelessness, and natural disasters, etc. In addition, based on the locations, there are tunnel accidents, highway construction accidents, and residential building site accidents, to name but a few.

Construction accidents can be caused by a variety of reasons, and different disciplines involved in a construction project may all be responsible. In the planning phase, owners may fail to consider potential site safety issues, and pay little attention to safety management. In the design phase, designers and architects may neglect all possible safety-related design codes or not be able to eliminate all possible factors. In the construction phase, contractors may fail to be cautious about site safety risks or report problems in time, and workers may do their job carelessly. The approach of this theory is pointed to the worker as the main factor of the accident. This approach as mentioned by Abdelhamid [2] studies the

tendency of humans to make error under various conditions and situations, with the blame mostly fall on human (unsafe) characteristics only. But this theory does not blame the workers as the main problem for accident, other factors such as design of workplace and tasks that do not consider worker (human) limitation also take part as the reason why accident happened [2]. In general, the overall objective of human error theory is to create a better design workplace, tasks, and tools that suitable with human limitation. There are some theory that related to the human error theory such as behaviour model, human factor model, and Ferrel theory. Most of these theories address the human (worker) as the main problem that makes an accident happen such as permanent characteristic of human, the combination of extreme environment and overload of human capability and conditions that make human tends to make mistake [2]. Accident don't just happen, they are caused. According to Ridley 99 per cent of the accident are caused by either unsafe acts or unsafe conditions or both [3]. As such, accidents could be prevented. The unsafe act is a violation of an accepted safe procedure which could permit the occurrence of an accident. The unsafe condition is a hazardous physical condition or circumstances which could directly permit the occurrence of an accident. Most accident results from a combination of contributing causes and one or more unsafe acts and unsafe condition. Accident theories and models discussed in the previous section have evolved from merely blaming workers, conditions, machineries into management roles and responsibilities. Nowadays, accident models are being used to better explain the causes of accident so that appropriate actions could be taken to make improvement. However, in order to effect permanent improvement, we must deal with the root causes of accident. A review of the literature indicates that finding the factors and causes that influence construction accidents has been the passion of many researchers. Kartam and Bouz [5] did a study saying that in construction the causes of accidents were due to worker turnover and false acts such as inadequate safety performance, improper cleaning and unusable materials, destiny, low tool maintenance supervisory fault, and misplacing objects. Abdel Hamid and Everett [2] conducted a more comprehensive study and classified the causes into human and physical factors. Human factors were due failed to secure and warn. Failed to wear personal protective equipment (PPE), horseplay, operating equipment without authority, operating at unsafe speed, personal factor, remove safety device, serviced moving and energized equipment, took unsafe position or posture, used defective tool or equipment, and other unsafe action. While, physical factors were due to unsafe act of another person disregard known prescribed procedures, defects of accident source, dress or apparel hazard, environmental hazard, fire hazard, hazardous arrangement, hazardous method, housekeeping hazard,

improper assignment of personnel, inadequately guarded, public hazard, and other unsafe conditions. Lubega [6] concluded the causes of accidents were mainly due to lack of awareness of safety regulations such as lack of enforcement of safety regulations, poor regard for safety by people involved in construction projects, engaging incompetent personnel, non-vibrant professionalism, mechanical failure of construction machinery/equipment, physical and emotional stress, and chemical impairment. Pipitsupaphol and Watanabe [33] claimed that construction sites have classified the causes into the most influential factors for an example unique nature of the industry, job site conditions, unsafe equipment, unsafe methods, human elements, and management factors. They further concluded that major immediate causes were due to failure to use personal protective equipment and improper loading or placement of equipment or supplies. Failure to warn co-workers or to secure equipment, and improper use of equipment is also one of the factor causing accidents in construction area [4].

In the past decade, need for safety awareness among construction companies has greatly increased. This is due to the high cost associated with work-related injuries, workers' compensation, insurance premium, indirect costs of injuries, and litigation. Every year, a considerable amount of time is lost due to work-related health problems and site accidents. There are several factors responsible for health problems and construction site accidents. Safety and quality are vital in the construction industry. The industry desires good quality while ensuring a safe working environment at workplace. Pheng and Shiua [34] emphasized that quality and safety should be integrated to achieve better coordination and utilization of resources. Koehn and Datta [35] revealed that issues like poor quality work, unsafe working conditions, and lack of environmental control can be improved by adopting safety rules and regulations. Accidents in the construction industry are costly in human and financial terms. The economic cost is not the only basis on which a contractor should consider construction safety. The reasons for considering safety are humanitarian concerns, economic reasons, laws and regulations, and organizational image. Cost of safety is paid by the organization either through the uncontrolled cost of accidents or through the controlled cost of safety program. The uncontrolled cost of accidents includes the loss of productivity, administrative time for investigations, and disruption of schedules, wages paid to the injured workers, adverse publicity, liability claims, and equipment damage. The controlled cost of safety program consists of salaries of safety, medical, and clinical personnel, expenses for safety meetings, inspections of tools and equipment, orientation sessions, site inspections, personal protective equipment, and health programs. The identification of root causes of accidents is a complex process. Accident mitigation requires a comprehensive understanding of construction

process. Accidents are the direct results of unsafe activities and conditions, both of which can be controlled by management. Abdelhamid and Everett indicated three main root causes of accidents: failure to identify an unsafe condition that exists before or after the start of an activity, carry on a work in unsafe condition, and decide to perform regardless unsafe site conditions. Ali reveals that construction accidents happen due to unsafe acts and conditions. According to Tam, accidents are caused due to poor safety awareness, lack of training, lack of organizational commitment, poor technical supervision, uncontrolled operation, unwillingness to input resources for safety, shortage of skilled labour, unsafe equipment, lack of first aid facilities, lack of safety regulations, lack of personal protective equipment, lack of innovative technology, and poor information system. Unsafe conditions such as missing guardrails, defective tools, hazardous conditions, excessive noise, and lack of sufficient light, and unsafe behaviours as smoking at workplace, improper use of equipment, work without safety appliances, not to use protective equipment, and being in an unsafe place are the immediate or the primary causes of accidents.

Unsafe conditions and unsafe behaviours are the responsibility of management as these are developed due to the failure of management to anticipate issues like training, maintenance, instruction, and not having safe systems at workplace [7]. The number of accidents occurrence in the United Kingdom alone saw a highly dominated figure coming from the construction sectors from the year 1995 to 2000. In United States, accidents in construction accounted the most worrying and dangerous sector although there was a substantial decrease in the year 1999. However, its statistics remains above the average. In other Asian countries, Hong Kong reported a significant high level of injuries and fatalities encountered also in the construction industry followed by Japan. Malaysia, recorded a worrying increase in the numbers of accidents occurring at the construction sites by the Social Security Organization (SOCSO) indicating the number of permanent disabilities and fatalities from year 1996 to 2008. Although the construction industry is not the highest contributing industry towards the accident statistics in Malaysia, however, its figures showed a very high rate in the year 2000. With such unpredictable figures reported, accidents in this industry have captured the attention and concerns from both governmental and non-governmental organizations.

Since construction jobs are so demanding physically on a person's body, a variety of injuries can occur. Therefore it is important for employers to provide a safe environment for their construction workers. There are regulations set by the government in the form of OSHA guidelines in order to ensure that all businesses follow a certain baseline of safety. The safety and health managers of a construction company need to make sure that certain

aspects of the jobs are maintained to reduce hazardous activities. On the construction site is it very important to maintain lighting that illuminates the areas where the work takes place. The lighting is important in order to avoid trips and falls. Material handling and storage at a construction site is also very important. In order to prevent equipment failure from overuse and overload it is essential to check tools regularly for safety [36]. Collapsing of stacked resources can also be prevented with standard inspections of the storage areas. Protective equipment is essential on the construction sites. Hard hats are of top priority in order to protect the workers heads. Also many employees are exposed to long durations of loud damaging noises in which hearing protection would be crucial. Falling is probably one of the greatest hazards of construction work. In order to protect employees, although awkward, it is important to maintain the proper body harnesses for protection. The length and knot of the rope for harnessing is important in safety [13].

In the international construction scene, the inclusion of both the traditional quality and safety efforts within a TQM system is advocated by Dias and Curado [37]. They suggest that the TQM emphasis on the customer will lead to protection of the employee who is a vital customer, as mentioned previously. They write that safety record keeping, particularly in Europe, would be improved and a needed "safety culture" comparable to the existing "quality culture" would result. They suggest that an international standard for safety measurement be developed comparable to the models for quality management such as the ISO 9000 series. A research project done in collaboration with the European Construction Institute studied the state of integration of safety and quality altogether with environmental management [38]; The finding was that the systems generally remain independent of each other in spite of probable benefits that would accrue from closer integration. Some of the reasons for the lack of integration are perceived difficulties due to project-specific requirements, legislative requirements, and a general lack of understanding and commitment. It is clear that quality and safety are complementary issues. They are distinct but similar the associated problems have common roots in the laws of probability, the indifferent universe and human nature. This is why the programs devised to manage these look so much alike. The value of including safety in TQM is recognized in the United States and in Europe. Given, then, that this close relationship exists, what are some possible implications? Each of the next four sections is a proposition based on the quality and safety relationship [15]. Despite risk control improvements, construction remains a dangerous business, accounting for the second most fatal work injuries of any sector after transportation and warehousing, which have the most fatalities. Building a safer workplace and industry, requires constant effort and continual improvement, but the result is well worth

the investment of time, resources and money. Today more construction companies are retaining a larger portion of the risk through higher deductibles, and can expect to bear significant costs for any accident involving bodily injury. Delays resulting from accidents will also prove expensive. To be competitive, companies need to control all costs, including insurance. Safer companies tend to be more appealing to potential clients and to insurers.

A proactive safety culture helps to save lives, retain workers, reduce claims and delays, and enhance productivity and profitability while strengthening the company's reputation. Culturally, construction remains an industry where workers may feel that taking risks is a part of the job and may worry about what their peers think of those who take extra precautions. The reality is that construction workers are more exposed to workplace injuries because of the inherent dangers of a job that often involves working with large machinery and power tools, often many floors above the ground. Companies routinely pre-qualify subcontractors for experience, qualification and financial strength, but safety history and performance should also be criteria. To evaluate subcontractor safety performance, companies should review their experience modification rates, their Bureau of Labor Statistics recordable and lost time incident rates, OSHA citation record and their overall safety culture and procedures. The pre-qualification of subcontractors should not stop with safety history and performance. It should include a review of the subcontractor's own safety culture and how the company incorporates safety into its day-to-day operation. General contractors can enforce across-the-board job site safety practices for subcontractors through subcontractor agreements and bid documents. This will ensure that subcontractors are aware of the safety requirements and expectations in advance. Subcontractors are responsible for the safety and health of their employees, but also need to ensure they perform their work in a manner that protects the general public. Failure to select subcontractors that implement a proactive safety culture opens general contractors up to potential liabilities. Safety isn't simply common sense. Workers need to be trained to properly use a variety of safety equipment, such as fall arrest systems, and they need to know the appropriate regulations. Orientation shouldn't be limited to new hires. The company should provide orientation specific to each project. The orientation should include an overview of the project, an in-depth review of the safety requirements and expectations, evacuation plans and procedures, disciplinary actions, substance abuse testing policy and fall management procedures and requirements [17].

A well designed safety organization for contractors, subcontractors and interface with department is are very essential. Implementation of Safety is a line management function; therefore its ownership lies with them. These line managers are to be backed up by competent persons

in Industrial safety that provide expertise and supervision of work environment and equipment such as lifting tool, tackles, scaffolding, and ladders used in construction. Approval of Industrial Safety requirements and their implementation takes a priority for all of us. Hence, we must develop and institute procedures, work plans and programs that are implemented with a common understanding of utility and contractor team. In this context, the regulatory requirements are equally important which need to be understood and implemented in clear and unmistakable terms by all concerned including the contractor organization [18]. Apart from the human cost of suffering an accident, the economic effect can be devastating. In addition to these factors, the short term and transitory nature of the construction industry, the lack of a controlled working environment and the complexity and diversity of the size of organizations, all have an effect on safety performance within the industry. Despite the evidence which suggested that the construction industry has an unenviable safety record, there appear to be few marked initiatives on the part of the researchers or safety practitioners towards the facilitation of an in-depth study into the attitudinal aspect of safety. Therefore, while one may continue to undertake the same work as one did when was younger, tends to do it in a different way. Thus, because of this ability to adjust, one can continue with a highly skilled activity which makes considerable demands on the perceptual and central mechanism well beyond the age at which we could ever hope to acquire such a skill from start. This indicates that tasks where operatives are paid hazard money are subject to higher risk of accidents. This is tantamount to an inducement to task risks, and that such an inducement ran counter to aims of safety promotion on site and in the construction industry generally. The result also showed that there was a strong relationship between productivity bonus pay and safety performance [19]. Developing a proactive safety culture may take long time and require spending of large sum of money for planning, investigating and implementing into each level within the organization. Once it succeeds, the relative rewards will be achieved in terms of competitive advantage, quality, reliability and profitability within organization. Safer behaviour is reflected by good attitude. Many accidents/incidents that occurred in the workplace especially in the building construction sites were due to inadequate adherence of workers to work procedures. The workers must realize that they play an important role contributing in the accomplishment of the building construction. The awareness and perception of the workers toward safety, health and their working environment are important aspects to enhance the building construction to the better condition to the workers themselves [20].

3. CASE STUDY AND DATA ANALYSIS

This research was studied during an observation of three construction sites which builds landed house whereby it is believe that majority construction labours are foreigners whom migrated to Malaysia for construction works. 60% of them are from Bangladesh, 20% from Myanmar and the rest 20% from Indonesia. It was observed from three different locations in Penang while they were in progress building landed houses. The observation of the research have resulted 9 of the labours safety awareness during their construction work as if in the Table 1.

Table 1: Observation on labors safety awareness during building landed house

Applied PPE	Site 1			Site 2			Site 3		
	Labor A	Labor B	Labor C	Labor D	Labor E	Labor F	Labor G	Labor H	Labor I
Safety Helmets	✓	X	X	X	✓	X	✓	X	X
Safety Boots	X	X	✓	✓	X	X	X	X	X
Goggles	X	X	X	X	X	X	X	X	✓
Gloves	X	X	X	X	X	X	X	X	X
Scaffolding	X	✓	X	X	X	X	X	X	X
Fall Arrester	✓	X	X	X	✓	X	✓	X	X

Abbreviation: -

✓ = Wearing PPE; ✗ = Not Wearing any PPE; PPE = Personal Protective Equipment

Demands on labour force nowadays increased rapidly each year as the construction companies need to hired labours from overseas. This is leading the workers to immediately start work with basic knowledge without having any further training. The developers as well didn't concern on the safety of the workers at construction site. During the observation from the three construction sites it is stated most of the workers is working under hazards which anytime could jeopardize their live. In this three days observation, it reported that the supervisor will only inspect the side once a week. Minimum supervision at a construction site could lead to more accidents happen frequently. It is clearly stated that most of the workers are not aware on the site's safety and protection where most of them are not wearing a proper PPE during site work. PPE could not only give protection to the workers but in fact it also provides a safety working environment. Failure in wearing or not using proper PPE can cause injuries or even death during the work.

There are so many rooms to improvement at construction sites to reduce the rate of the fatal and injury accidents at construction sites. It seems that construction industry is considered most dangerous and hazardous working site hence it should give more priority on safeties. Construction sites have the maximum injury ratio of all unsafe working environments. Labouring at dizzying

heights with dangerous machinery means that serious injuries or death are a daily reality for construction workers. Steps to reduce accidents at construction need to implement by all parties to minimize the fatalities towards the workers who highly expose to those hazardous. Untrained personnel who operate heavy machinery such as forklifts or work with electrical wiring are some causes of workplace accidents. Sometimes these accidents are caused by individuals with inadequate training, or individuals with no training at all who are temporarily filling in for other personnel.

One of the ways to improve the safety at construction environment is to hold more safety training to educate the labour more on their safety during construction. The labours that are in construction fields mostly are not highly educated. All the workers must be trained well on the skill they involved in. Less knowledge in safety risk and unskilled workers is one of main reason to harm themselves in fatal injuries and death during constructions. Without any knowledge or safety awareness the workers will not follow the rules and procedures of the construction seriously. Frequent training and education on construction safety, may help the labours to keep safe and efficient throughout the construction. All construction sites that bringing in new labours especially from foreign should sent them to a special training to educate well enough on safety before they were posted at any respective sites. The workers should attend on job training on the awareness of the safety in construction under probation period instead of directly place them at sites. The training should not focus only safety awareness but in fact the specific task which they will later perform at their sites. All the training should also include the ways to use machines and tools which will be used at construction site. The workers who failure to operate the machines or less knowledge using construction tools will not only injures them but could also harm their lives. All sites should increase the safety and education training to all new or skilled works three months once to always remind them regarding the safety protection at construction and to lead them to work more efficiently. The authorities have to revise the training method and materials from time to time to create more knowledge workers and safe and healthy working environment. Some construction workers have less experience in distinguishing risky situations at construction sites. This is why it is important to take extra attention on those less experience working at construction sites. They should get adequate training and knowledge on the safety educations to reduce accidents at sites. Besides this the sites can also have more safety and risk awareness programme in order to let the workers alert on the hazards which surrounded them at the sites. All workers need to be vigilant to the dangers so that they could precise any unsafe work condition an avoid hazards occur easily. Training on PPE also very beneficial to the workers

to explain and demonstrate them the importance of construction's protection personnel equipment's which protect themselves from injuries during construction. Workers who fail to wear proper PPE can cause injuries and even loss of lives. PPE plays vital parts in labours safety protection in construction sites. All the sites should give more quality PPE such as safety boots, hats, goggles, gloves, and so to the workers because this is the only equipment saving the workers lives from getting hurt. Those labours that will be expose to chemicals and liquids should attend some special training on the chemical usage and the risk of the chemicals for them to be more caution while using it at construction area. The Malaysian involvement in safety and health training program for construction workers was accessible. Providing safety awareness to the worker through safety identification organization is seen an effective way to get their respond to participate. The implementation of this safety passport program, however need to be spoken prudently. Without correct observing and implementation of the program, it might turn to be a failure. In the other word the efficiency of training is also dynamic. Besides the need for valuation in a specific training program, workers also need to be reskilled to energize their safety and health awareness that getup with present condition.

Another improvement can be done to reduce construction accidents are to be bringing safety regulation more stern. Rules, regulation and procedures are the best ways to keep the workers obey the instruction towards the safety of the sites. All the construction must be liaise with Construction Industrial Development Board (CIDM). The object of CIDM is the overall objective of CIDB is to develop the capacity and capability of the Construction Industry through the enhancement of quality and productivity by placing great emphasis on professionalism, innovation and knowledge, in the endeavour to improve the quality of life. The Department of Occupational Safety and Health (DOSH) and other government agencies have regulations that lay down the legal requirements to ensure the safety and health of not only the workers at the place of work but also the public as well. This guideline applies to all place of work in building operation and work of engineering construction activity in Malaysia covered by the Occupational Safety And Health Act 1994 (Act 514), the Factories And Machinery Act 1967 (Act 139), and all the regulations made there under. It is designed to serve as a handy reference and to be read together with the above mentioned legislations and other industry codes of practice. In guideline for public safety and health at construction sites (1st Revision), under clauses 7.2 general duties and of employee it is stated that every main contractor, contractor and sub-contractor shall develop a safety and health manual that has provision for safe guarding the safety and health of the public and his employees (Section 15 (2) (a), Occupational Safety and Health Act 1994). Whereby under clauses 7.4 it is written

that every developer, main contractor, contractor and sub-contractor shall ensure that all workers are properly informed of the hazards of their respective occupations and the precautions necessary and adequately supervise to avoid accidents, injuries and risk to health, and in particular that young workers, newly engaged workers, illiterate and foreign workers (Section 15(2)(c), Occupational Safety and Health Act 1994). In Malaysia, law and regulation linked to the safety and health of the worker of the respective industry. The implementation of this rules and regulation will give remarkable enhancement is not only to safety and health if the worker but also to the level of consciousness of the worker and employer about the reason of accident in construction site. Nowadays, the government is always observing the OSHA performance those implements by the employer in order to reduce the number of accident at the workplace and also try to keep improving their OSHA standard. Through these acts, implementation against misbehaving contractors and workers should be carried out always from time to time. Labours who repeating their wrongdoings, they should be fined. In actual fact, if enforcement is not carried out regularly, the offences will become second nature and the habit will be hard to break in the future. As a regulatory body, the government has the right to take action against the misbehaving contractor or worker. In serious cases, the developer and consultant would be brought to court to be charged if found not obeying the regulation stated. Perhaps in the future, the authorities would have the right to penalise contractors who challenge the safety and health guidelines at a construction site. Therefore, the regulations acts in Malaysia in occupational safety and health is really assisting the industry to have an effective work procedures towards their workers. Lastly, the government should tighten the procedures by conducting a thorough investigation should such accidents occur and to reduce fatal death and injuries occur at construction site.

Apart from this, labelling, inspection and buddy system is also one of the ways to reduce construction accidents happen frequently. All the hazardous chemicals substances need to be clearly identified to avoid any misuse during the work. Site supervisors should inspect the side more often to supervise the workers to ensure they are following the instruction of the construction sites as well. The first safety measure for preventing accidents is to detect the perils that infuse. It is significant to look at both the apparent safety threats as well as the ones that are unremarkable. Fire, electric, slip-and-fall and mechanical hazards are some observable ones, but the less noticeable types may include covers that are not appropriately followed to a floor surface or uneven floor tiles. Contractors can take steps to avoid accidents by securing away the things like chemical substance solutions and unsafe or high voltage machines so that they are unreachable to those who are not skilled to use it. This is a

practical way to keep those in the immediate construction environment safe even when hazardous objects must be present. Warning and caution signs can reduce accidents at construction sites by notifying others workers about forthcoming safety threats at the sites. For an examples, when a floor surface is wet or slippery, set out a sign to warn people to go around the dangerous area. All the construction sites must set out a warning sign for the area that has a risk of falling objects to prevent accidents. Even a label on a bottle of toxic chemicals can let the workers know the contents of the bottle are dangerous. Those construction sites or any contractors who found not obeying the warning signs at the sites can be fined or jailed or both together. The signs are the only way to remind the labours that they are surrounded of danger all the time. Below are the some construction warning sign which is a must to place during every construction.

Construction sites enclose a lot of hazards to the environment that challenge to safety, site supervisors shall perform routine safety inspections to keep hazards under control. According to the Occupational Safety and Health Administration, inspections are an essential part of preventing accidents that affect to mechanical power presses, other types of machinery, electrical equipment and other types of safety hazards. During a safety inspection, visual assess is needed to an object or environment to survey for noticeable dangers. Inspections may also include testing equipment to ensure it performs properly upon use because failure machines or tools are also one of the parts to occur fatal accidents at sites. Site inspection also included risk assessment which helps to determine risks specific to the sites. Checking on the equipment regularly is essential, and upgrade to new equipment when older equipment begins to fail. When employees have accidents, evaluate how well the safety equipment worked, and if the equipment doesn't ease the effects of the accident, try upgrading or change to an advance and high technology machines and tools as well. Every construction sites has its set of risks. Flammable chemicals can explode into flames, thus all the flammable substances must be reviewed from time to time. Supervisors should review risk assessment for a list of potential hazards, and secure these hazardous items. Check them daily basis to ensure they're properly secured, and should allow workers to work with a potential hazard that is not functioning properly, such as a chainsaw that keeps breaking.

Beside these improvements ways to reduce accidents at construction sites, buddy system also plays a very important role in this. Buddy system mean if used to have any blind spot and large machinery often does, than it is needed one or more buddies carefully directing them where to go when backing up a large piece of equipment. Technically an ultra-safety move would be to also install a loud reverse alarm. The purpose of the buddy system is to provide prompt support to the workers in the event of an

emergency. The buddy system is important for many different reasons from providing an extra set of eyes on the job noticing safety issues to alerting and providing immediate medical attention should an event occur. The buddy system is mainly working in pairs or in larger groups, together, on a project specially for the purpose of guaranteeing safety. Effective implementation of this system is not two individuals working on a project at the same time. Effective implementation is one person conducting the work while the other observes and quite possibly assists. Both individuals have a job to do, and one of those jobs is to ensure work is completed safely. Buddy system can be used for all type of construction. For an example at road construction, buddy system can prevent accidents such as hit by moving vehicle take place while workers construct roads or highways. In road construction, more manpower should be placed at the sites to monitor and direct the road traffic and other to do the repairing work at road construction.

Accidents cannot be eliminated at construction site but hereby it can be reduced to lesser accidents arise during any constructions. The best improvement way to prevent construction accidents and to increase safety protection is through training and education. The more a labour is educated the more he will aware of the danger surrounded him. Knowledge can guide a person in to a correct path in any situation. To avoiding work-related injuries is a job that requires change workers attitudes. When approached early and as part of basic training, it can turn into a great way to change the dynamics of the job site and help make the workplace a safer environment for everybody. The training module is prepared by NIOSH and is purposely designed for construction workers. This module is called Safety and Health Induction for Construction Workers (SICW). Since construction workers are multi background, ranging from workers that illiterate up to well-educated construction professionals like engineer, so the training module have to be in a simple approach and easy to understand. To achieve this, materials are delivered in the form of picture presentation and less amount of writing. Training and safety education will contribute towards making the workers become more competent and proficient in health & safety during the construction. It can help the business to avoid the distress that accidents and ill health cause and help evade the economic costs of accidents & occupational ill health. Training helps the workers to learn how to do something telling them what they should or often as important should not do, or simply giving them information. Within the construction industry, there are rising concerns about the level of competency and high expectations of newly trained and qualified labours. In construction, great significance is positioned on permanent education. Without this knowledge, the information gained from innovation and work involvement will not range through the industry. General working experience is acknowledged as appreciated sign

of workers employment. To help validate this, the evidence needs to be recorded as training. Training and education enhance the quality of the safety in any field. Knowledge contractors will be more cautious than unskilled workers. The workers should be given a short test on what they have been trained. Those workers who resulted below the passing mark should re-train until they become more efficient. Through all formal and informal training sessions, the operation manager enhanced workplace spirituality and simplified a touch of connection by continuing daily communication with the workers, inquiring about supply and safety needs and follows up on health and performance concerns and communicating informally. The majority of exercise and knowledge organizes workers for their future within industry, no training is more vital than that associated with safety. Training can have an affirmative influence on workplace safety but there are insufficient perfect procedures about how such training associates would be attained and realised to achieve a permanent workplace benefit for employees and the organisation. What is clear is that training should be planned to accomplish great assignment by contributors and would also be powerfully related to workplace actions and controlling so that transmission between the training culture and the workplace can be continuous.

One of the ways to develop trainings at construction site is to revise the training materials frequently. The labours will get bored if they found the training is no longer beneficial to them. Once a while, the management shall carry out an external safety seminar to promote the workers reading the safety awareness within the construction sites. The benefit of safety training is measureable almost efficiently to master new skills at constructions. Safety training can be improved by hiring external trainer who is more experience to conduct the session will be more effectively. All the trainings are not only safety based but in fact shall have training on the tools and machinery usage at the sites. Whenever there are new machines and tools the contractor should go for an on job training before handle the equipment. Site supervisors regularly to join safety training sessions and always monitor safety rules and protection when they're in construction areas, their example encourages the labours to take safety protection seriously and also include assessments of training program involvement and general safety act on workers performance appraisals, workers have more encouragement to take part in and pay attention to the training programs and other safety efforts. Site supervisors need to provide reports on workers safety performance to the safety trainer, review training can be targeted to where it's needed most and when supervisors and workers have an prolonged role in the training program, the program has a stronger foundation to support development. A good way to evaluate the safety training program is to evaluate post-training employee job

performance. Workers who passed the examination would be awarded with a skills evaluation certificate. Perhaps in the near future, it could be implemented as an approach to the enhancement of skills and the awareness of safety. They must pass the exam to be licensed to work in the construction industry. If they fail to do so, they may be required to re-seat another exam of safety. Assessments can be done shortly after the training program, but long-term maintenance and implementation of new skills is measured by evaluating employee performance several weeks or months after the training takes place. Assessments comprise observations, and they take time to do. One solution is to have workers to participate in the evaluation program. Equipped with checklists and instructions, they can provide with valuable feedback on the long-term effectiveness of the training program. Another benefit to this approach is that the evaluation workers essentially get refresher training while they conduct the evaluations. Through training and education the workers shall boost up their attitude on safety awareness while in construction. They can improve their level of skilled by having a safety and healthy working environment. Training helps the workers to have a better safety protection during construction.

4. FINDING AND DISCUSSION

The findings revealed that site mishaps are more likely to happen when there are poor company guidelines and procedures, hazardous practices, and negligence attitudes of construction laborers, poor management commitment and insufficient safety knowledge and training of workers. The majority of accidents happen as result of dangerous acts and hazardous conditions. Since all threats in construction sites are not always possible to be recognized and reduced therefore some protection and prevention need to emphasize at the site. Construction accidents can be just by classifying the root causes of accidents, which is possible by accident investigation. The poor safety performance of the construction industry continues to give international cause for concern. Unsafe condition is one of the cause accidents happen at construction site. It's a condition where the site and its environment are not safe according to safety and health standards. A labor who doesn't notice the unsafe condition, consequently there is no risk and hazard concern by the worker. There is a fact that some dangerous environments cannot be recognized such as not-human-related conditions or human factors desecration. Human cause's desecration may lead to injuries namely increasing distress conditions, carpal tunnel syndrome, and exhaustion. Most construction activities take place in quickly shifting situations and under developing site conditions. Unsafe condition, risky task, insecure tools, and bad weather had moderate evidence of encouraging relationship with unsafe conducts

and accidents. Construction-related tasks are often dangerous due to factors such as outdoor processes, work at heights, complicated site plants, and equipment operations coupled with workers' attitudes and behaviors towards safety. The unsafe acts of workers are considered as major contributors of work-related accidents and injuries on construction sites. However, not much work has been done to address the reasons why unsafe acts of workers occur particularly in construction industry. Working without authority on the job can cause accidents since unauthorized workers may lack the necessary skills, or unfamiliar with the job process. Some workers fail to advise or to secure members out of danger is considered as an unsafe act since many accidents occur because workers' pay less attention to warning or securing co-workers who are working under conditions with high probability of accident occurrence. Beside this, ignoring to the safety protection may increase chances of getting injured seriously and loss of lives. If the workers be more cautious and aware during the construction can avoid anybody to hurt themselves or others as well [26]. Most construction workers are being put at far more risk to lead more fatal accidents at construction site by having poor attitude towards safety. The current study has produced a comprehensive qualitative representation of the nature and variety of influences that effect insecure activities and accidents on construction sites. As a result, this review identified many studies that were conducted to explore the factors influencing construction safety which still continuing the research on the safety protection throughout the year. Therefore, this assessment emphasized a figure of abstract subjects related with the factors prompting security act in the construction industry, not only to diminish theoretical uncertainty but also to offer well considerate of the relations among theory and practical findings, primary to the appearance of an incorporated theoretical model. In addition, this study used inquiry to scrutinize the connections among related features and risky actions and fates. Consequences specified that the group had great indication of link with insecure conducts and accidents, closely monitored by project management, site condition, and individual characteristics. Safety protection creates with having a clear considerate of factors that play key roles in their causativeness.

The problem faced during this study of the project is some construction sites did not allow to enter their construction sites and some even doesn't want to give permission to talk to the workers. Most of the sites are too busy with work to meet the deadlines of the construction. The positive outcome of this study analysis gave a safer workplace and enhanced company reputation as well. Therefore it also could have decrease fatal accidents as the most important benefits arising from organization of safety health and environment programs among the practitioners whereas to improved work performance and

increased organizational performance. Hence, it helps to reduced injuries and increase worker's working ability though out. The findings further identified organizational skills as the most desirable for the effective implementation of safety management by developers. Putting a safety management system in to construction where place saves money. Reducing liability and risk in the workplace lowers insurance claims and premiums. The system ensures regulatory compliance, so fines and other costs associated with noncompliance are reduced or eliminated. A safer workplace with adequate protection is a result of identifying current and potential hazards, and eliminating or reducing the risk to an acceptable level. Managing the workplace safety reduces accidents and downtime. The system provides employee involvement and training, motivating them to safely and efficiently perform their jobs. In the construction industry, companies may use indicators like the number of safety incidents in a specified time period, profitability of construction jobs or reviewing the cost of construction materials against the predetermined budget. These indicators may create a competitive advantage because they have a deeper knowledge of their operations, allowing them to price future contracts more competitively than competitors. Safety protection help developers to find weak areas in their operations that can be improved, leading to faster construction completion times and fewer workers safety incidents. Because companies can only bill users at specified times during the construction process, shorter construction times allow them to recoup their money quicker. Companies can also bid on projects concurrently, giving them an opportunity to have more construction projects in the pipeline, increasing future profitability. Measuring the number of safety incidents at each job site is also important, since labors safety damages slow down the construction progress on the job site. Companies may also earn financial rewards by having a strong employee safety record. Constructions companies emphasize safety protection in their construction usually have more flexible operations than their competitors. Construction managers keep information on the lead time needed to order supplies, hire additional labor and the time it takes to finish certain construction projects manager use this information when managing multiple projects and moving equipment between construction sites. Constructions also need to plan for shortages or errors in the construction process. Construction measurements can be used to gather information regarding vendors and suppliers, giving managers the option of having a backup plan if the original supplier cannot fill materials orders in time for starting construction. Construction safety review study on the job site exposed that the safety level in construction sites differs with the project size. Big projects, constructed by huge global firms, have much better safety level and safety records than smaller ones. This specifies the need

for applying a safety ordinary to observe and apply safety necessities at work sites. Also the consequence shows that large projects have slightly discrepancy in safety levels, while small projects have a wide difference in their safety routine. With strong planning, effective operation and persistent training for safety protection with motivated safety management a good safety record could be achieved equivalent to worldwide level. However, we are not complacent and efforts to achieve the next level of excellence are being invested on a structured manner through the innovation in the training methodologies to achieve higher effectiveness of training among the contractor employees. Emerging and fulfilling behaviors based safety program could help to expand coordination of work force towards safety protection in work. Moreover, Implementation of original engineering methods could reinforce the safety necessities at intention phases to accomplish safe working environment during construction. Furthermore, it was suggested that authorized responsibilities should be obviously interconnected to the possible dealer at the time of request to offer. The proposal is that in many cases the contractors are not conscious of their implied legitimate errands in relation to the health and safety issues. Owing to growth in difficulty of jobs, the construction industry has become more dangerous than ever before. Construction organizations are faced with the challenge of having to closely monitor their safety management systems to minimize occupational hazards, while concurrently trying to stand incomes in an inexpensive market. The concepts of safety culture and safety climate were created from administrative ethos. Generally, safety philosophy is a set of fundamental pointers, principles, and standards that the organization keeps in safety protection while it is a summary concept classified the employee's principles about all the safety protection. Safety protection is frequently careful as more apparent than safety ethos as it involves the current position of a company. Researchers described safety environment as an indicator of the overall safety culture of an organization. It is suggested that safety protection is concerned with the ability to manage the safety is concerned with the workers awareness. The safety climate is largely a product of safety culture and the two terms should not be viewed as options. Safety protection in construction is crucially important due to the features of transfer and movement in the construction industry. Safety linked two conspicuous safety management behavior change and culture change approaches in terms of their theoretical and practical foundations. While effecting high quality work within stated time and budget, safety of workers requires a substantial consideration. The paper informs construction professionals regarding the significance of safety features and their consequences. The review suggests that there is a lack of responsive tools and resources to assist designers in addressing construction safety. Unsafe acts, unsafe

conditions, and failure of management to expect hazardous situations are the main causes of accidents. Work hazards on project site are not perceived to the extent they can harm, hence, awareness is a safe way to prevent accidents at workplace.

5. CONCLUSION

The purpose of this project to study the safety problems at construction are and safety health and environment protection as well. The construction industries are a very dangerous environment which has had a history of a fairly high number of harms in evaluation of other industries. Construction industry plays an important role in improvement of countries' economic growth. Despite the contributions to economic growth, construction industry has always been blamed for the high rates of accidents and fatalities; this issue has placed the construction industry among the industries with unreasonable rates of accidents, permanent and non-permanent disabilities and even fatalities. Construction sector is generally more hazardous than other sectors it is based on the literature finding, which is due to the use of heavy equipment, dangerous tools, and hazardous materials all of which increase the possible for serious accidents. The Malaysian experience in safety and health training program for construction workers was presented. Providing safety knowledge to the worker through safety passport system is seen an effective way to get their respond to participate. The implementation of this safety passport program, however need to be addressed carefully. Without proper monitoring and enforcement of the program, it might turn to be a failure. In the other hand the effectiveness of training is also vital. Besides the need for valuation in a particular training program, workers also need to be reskilled to refresh their safety and health knowledge that suit with current situation. Although there are many factors affecting perception of building construction workers towards safety, health and environment, the main factor perceived by the worker is organizational commitment and communication. Good structural obligation and communication is highly related with effective accident reporting, high line management commitment, active supervisor's role and active personal role. Active personal role to safety and health resulted in greater influence among workmate's and low obstacles to safety behavior. The works show that accident are caused by an extensive choice of issues, some of which are unsafe equipment, job site conditions, unique nature of the industry, unsafe method, human element and management. From the survey results, it is found that all the workers are aware of the main causes of accidents. The cause of accidents in the construction industry is a multi-faceted sensation mainly credited to workers' carelessness, failure of workers to obey work procedures, work at high elevation, operating equipment without

safety devices, poor site management, harsh work operation, low understanding and skill level of workers, failure to use PPE and poor workers attitude about safety. The findings somehow appear the claim of numerous connection models which say accident is the consequence of many contributing factors, causes and sub causes. Thus, the employer, employees, suppliers, manufacturers, governing agencies must combine forces and try to prevent future construction accidents by addressing the root causes of accidents. The project would recommend continuing the projects work on safety health and environment protection in construction area in more specific such as at highway or tunnel construction which include electrical, piping and confined spaces.

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