

Comparison of Safety Consciousness at the Construction Sites based on Local Authorities Safety Acts and Standards from Occupational Safety and Health Act 1994 (OSHA 1994) and Construction Industry Development Board Development (CIDB) (Case Study: Few Projects in Batu Pahat)

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Abstract: This research focuses on comparison of safety consciousness at the construction sites based on local authorities safety acts and standards from Occupational Safety and Health Act 1994 (Act 514) and Construction Industry Development Board (CIDB). A few case studies involving construction projects will be carry out in Batu Pahat, Johor area. The accomplishment of this research is base on survey and observation during distribution of questionnaires by recognizing the consciousness of the site workers and the management team about the site safety, to acquire the problem about site safety and suggest the safety consciousness at the construction site. From this study, the comparison of local safety acts and standards between the government sectors was quite impressive with averaged 77%, though not perfect; the implementation safety and health occupational while for the private sectors was a disappointment with averaged 17%. They did not implement any safety aspects from management level until labor level. The case study reveals the level of consciousness especially the private sectors were in unacceptable level and immediate action from Human Resources Ministry, Department of Safety and Health (DOSH) including Construction Industry Development Board (CIDB) needed to be taken to improve the situation such as sudden site inspection, periodical maintenance for safety management, organize more safety programs and implementation of new laws/regulations for more strictly safety stipulations. Hopefully, this study will be able to contribute better knowledge and understanding about the importance of safety consciousness for construction site.

Background

The field of construction safety in Malaysia has undergone significant change over the past two decades. There are many reasons for this. Some of the more prominent ones includes the following such as the changes of technological that have introduced new hazards at construction sites, proliferation of health and safety legislation and corresponding regulations, increased pressure from regulatory agencies, realization that productivity is increased in a safe environment, rising safe care and workers' compensation costs, a growing interest in ethics and corporate responsibility, increased pressure from the labor organization, workers, and the public in general and an increasing number of incidents of workplace accidents.

All of the factors, when taken together, have made the job of the modern construction professional more challenging and important than ever. These factors have also created the need for an up-to-date book on construction safety that contains the latest information needed by people whom responsible for safety and

health in one of the most dangerous industries – the construction industry.

The term "construction industry" implies the existence of a single uniform entity that is the builder of all the world's projects. In reality, the construction industry is an umbrella concept that encompasses a broad array of specialized crafts, occupations, and professions. Construction is big business in Malaysia, accounting for more than hundred millions in value annually and employing approximate more than half a million people. Construction companies both large and small should be viewed and operated as businesses. One key to success in business is minimizing cost. Providing a safe workplace is one of the most effective strategies for holding down the cost of doing business.

The construction industry has changed markedly over the years – specialization is just one of the ways. All of the changes, whether positive or negative, that have occurred in the industry have had an effect on the safety of the construction job site. In fact, some developments

have made certain aspects of construction work safer, while in the other hand, introducing new and even more dangerous hazards.

The forces that have played the most influential roles in changing the nature of the construction industry are inanimate power such as electricity, steam, hydraulics, and pneumatics that allowed the construction industry to move beyond the limits of human and animal power followed by machines that have done much of the work in the construction industry, materials that have broadened the capabilities of the construction industry immeasurably and finally work specialization which has created a wide array of focused crafts within the construction industry.

On the other hand, consider all of the new hazards these technological marvels have introduced for example, electrocution, typically the leading cause of death on the job in the construction industry. Then, a machine operated by a poorly trained or reckless individual is a dangerous piece of equipment. For materials such as asbestos – once called the miracle material – have introduced deadly hazards into the workplace. And for the work specialization, which typically promotes more through knowledge within a field, but it decreases knowledge and understanding across fields. This lack of understanding can increase the potential for accidents when a variety of specialists are working at the same job site.

From all of the information stated above, it is obvious that the lack of safety consciousness was the main problem. An implementation and motivation of safety consciousness in the construction sites shall be taken to improve the situation.

Research Objectives

The purpose of this research is to recognize the consciousness of the site workers and the management team about the site safety at the construction site especially in Batu Pahat, Johor, and follow by acquire the problem about the site safety and then suggest the safety consciousness at the construction site.

Research Scope

Comparison have been done based on safety consciousness that was practiced at the construction sites with what was stated in the safety acts and standards for Occupational Safety and Health Act (OSHA) based on division IV – section 15 until 17, division VI – section 24, and division VII – section 29 until 31 and for the

Construction Industry Development Board Malaysia (CIDB) based on Occupational Health and Safety Assessment Scheme 18001 (OSHAS 18001).

Questionnaire about safety consciousness have been distributed at the construction sites in Batu Pahat area.

Projects under government and private sectors have been taken as case studies.

Parts of safety which have been discussed are as stated below:

- Planning and organization
- Job implementation
- Equipment/provision
- Management and working behavior
- Workers' behavior.

Questionnaire Sheet Study

Distribution of questionnaires at the construction site have been done in a month where 50 sheets of questionnaire were distributed to the respondents from four construction projects, which both were the government sector and private sector respectively. 40 sheets have been retrieved to further the data analysis. All the respondents were mostly site management staff included the site workers that were involved totally at the construction site in Batu Pahat, Johor area.

Questionnaire Sheet Scope

The questionnaire scopes that have been done were focused mainly on these topic study scope which are:

- 1) *Part A*: Respondent profile
- 2) *Part B*: Knowledge based on Occupational Safety and Health Act (OSHA) and Construction Industry Development Board Malaysia (CIDB)
- 3) *Part C*: Perception on Safety Consciousness at the Construction Sites which divided into five (5) sections as stated below:
 - i. Section 1 – Planning and organization;
 - ii. Section 2 – Safety and health implementation in job consciousness;
 - iii. Section 3 – Safety and health implementation relating to equipment/provision;
 - iv. Section 4 – Management and working behavior; and,
 - v. Section 5 – Workers' behavior.

Evaluation of the Responses

From part B and part C (section 1 to section 4) which contained 34 out of 44 questions are refer to safety and health program evaluation as stated in Table 1. (Source: *Handbook of OSHA Construction Safety & Health, 1999*).

Relative Index

"Relative index technique (RI)" was used to analyze data from each respondent. This technique was used to analyze the strength of support from the level of agreement for each

respondent to be compared. The formula that was use to calculate the RI is:-

$$RI = \frac{\Sigma(1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5)}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Where;

RI = Relative index

$n_1, n_2, n_3, n_4,$ and n_5 = number of respondents

From this formula, the RI value is measure from 0.2 to 1.0 where the 0.2 represent the lowest support and 1.0 represent the highest support (Source: *Holt et al., 1996*). The factor with highest RI value will be taken as the main factor.

Table 1: Safety and Health Program Evaluation

If the respondents have answered "YES" to between:			
Items	Percentage, %	Evaluation	Status
31 to 34 items	92% to 100%	Have an excellent safety consciousness that needs minimal effort to improve it.	Obey
27 to 30 items	80% to 88%	Have a very good safety consciousness, but should strengthen it by addressing those areas answered "NO."	Obey
23 to 26 items	68% to 76%	Have an average safety consciousness, and definitely needs review and improvement.	Partial
19 to 22 items	56% to 64%	Have a very weak safety consciousness and needs immediate attention.	Caution
Less than 18	<52%	Have an unacceptable and the lack of safety consciousness will cost accident.	Unacceptable

Summary of Data Analysis

The data analysis was based on the data obtained from the distribution of questionnaires sheet concerning on the percentage of respondent profile, evaluation of responses on safety and health program and level of agreement using Likert scale and Relative Index.

Validity of Data

The accuracy and exactness of the collected data cannot be hundred percent guaranteed because it is relying on the respondent's etiquette and also depends on their sincerity, awareness, consciousness and understanding on the purpose and importance of this study and how it could be contribute for a better future of safety consciousness in the construction fieldwork area.

However, the data obtained through the questionnaires still need a verification of its validity to prove the study trustworthiness, reliability and credibility. The verification will cover the respondents responded to the issue presumptuous in each section of the questionnaires. Therefore, a validity check for

each section is required, to prove the validity of the information.

For part B and part C (section 1 to section 4), validity check is needed for the reason that this part contains the safety and health program evaluation referring Handbook of OSHA Construction Safety & Health (1999). The evaluation was determined based on percentage calculation on number of respondents answered "YES" where the government sector had overall of 81% meaning that they have a very good safety consciousness, but should strengthen it by addressing those areas answered "NO" and for the private sector with only 27% overall, meaning they have an unacceptable and the lack of safety consciousness will cost accident. Each limit of percentage has its own evaluation of responses as stated in Table 3.

For section 5, this contains the Likert Scale questions according to Survey Research Methods (1998). The RI values for each item in the questions are show in Table 2. Overall, the level of agreement on supporting the statements given averaged 0.80 for the government sector and 0.74 for the private sector in RI value meaning that the data is valid. The RI value is calculated by using the statistics method stated above.

Table 2: The Respondents' Perception on Workers' Behavior

Statement	Respondent Analyze							Level of agreement from respondent	
	LOA	Sector	1	2	3	4	5	HLA	RI
Q36. Do communication of safety and health effective between the workers?	No. of respondent	Govt.			3	19	3	4	0.80
		Pt.		5	1	9		4	0.65
Q37. Do any accidents occur related to workers' negligence?	No. of respondent	Govt.				15	10	4	0.88
		Pt.				12	3	4	0.84
Q38. Do any accidents occur related to workers out of working scope?	No. of respondent	Govt.			4	9	12	5	0.86
		Pt.			1	13	1	4	0.80
Q39. Do workers show discipline in safety and health aspect?	No. of respondent	Govt.		2	3	14	6	4	0.79
		Pt.		2	1	12		4	0.73
Q40. Do workers cooperate in safety and health aspect?	No. of respondent	Govt.		3	2	20		4	0.74
		Pt.		3	1	11		4	0.70
Q41. Do workers practice theirs responsibility in occupational safety and health?	No. of respondent	Govt.		4	2	19		4	0.72
		Pt.		3	2	10		4	0.69

*Note: LOA – level of agreement, HLA – highest level of agreement, Govt. – government, Pt. – private

Table 3: Safety and Health Evaluation based on the Respondents

Section	Statement	"YES" (%)		Evaluation of Responses	
		Govt.	Pt.	Govt.	Pt.
Part B	Knowledge based on Occupational Safety and Health Act (OSHA) and Construction Industry Development Board Malaysia (CIDB)	69	35	Have an average safety consciousness, and definitely needs review and improvement.	Have an unacceptable and the lack of safety consciousness will cost accident.
1	Planning and organization	77	9	Have an average safety consciousness, and definitely needs review and improvement.	Have an unacceptable and the lack of safety consciousness will cost accident.
2	Safety & Health Implementation in Job Consciousness	92	51	Have an excellent safety consciousness that needs minimal effort to improve it.	Have an unacceptable and the lack of safety consciousness will cost accident
3	Safety & Health Implementation Relating to Equipment / provision	84	21	Have a very good safety consciousness, but should strengthen it by addressing those areas answered "NO."	Have an unacceptable and the lack of safety consciousness will cost accident.
4	Management and working behavior	83	18	Have a very good safety consciousness, but should strengthen it by addressing those areas answered "NO".	Have an unacceptable and the lack of safety consciousness will cost accident.

*Note: Govt. – Government, Pt. – Private

Comparison

The comparison will be done by comparing the local safety acts and standards between the government sector and private sector. This is done by stating out the safety acts and standards based on the scope of study and compare them with both sector either they obeying or partially or caution or unacceptable the safety acts and standards (refer Table 1). It is done in this method based on the informal interviews with some of the management staff during the distribution of questionnaires, the observation during case study and the analysis data result. The Table 4 as stated below indicates the comparison;

From the data evaluation above, the government sectors have been obeying much of the local safety acts and standards. These proved they were trustworthy in implementing safety aspects. The only minor errors were the general duties of employees at work where they have an average safety consciousness, and definitely needs review and improvement followed by implementation of Occupational Safety and Health Assessment Scheme 18001 (OSHAS 18001) Do It Yourself (D-I-Y) where it was unacceptable. The factors were self-regulate and unwillingness of employers to organize OSHAS 18001 for their employees.

Table 4: Comparison of Safety Consciousness at Construction Sites between Local Safety Acts and Standards

LOCAL SAFETY ACTS & STANDARDS		Qs. related	Average "YES" (%)		STATUS	
OSHA 1994 (Act 514)			Govt.	Pt.	Govt.	Pt.
Part IV – General Duties of Employers & Self-Employed Persons	Section 15 – General duties of employers and self-employed persons to their employees	Part B-Q2, Part C-Q3, Q5, Q14, Q15, Q16, Q18, Q19, Q22, Q23, Q24, Q25, Q29, Q30, Q32, Q34.	86	34	Obey	Unaccpt.
	Section 16 – Duty to formulate safety and health policy	Part C-Q1, Q26.	82	0	Obey	Unaccpt.
	Section 17 – General duties of employers and self-employed persons to persons other than their employees	Part C-Q28, Q29, Q31.	85	0	Obey	Unaccpt.
Part VI – General Duties of Employees	Section 24 – General duties of employees at work	Part C-Q7, Q12, Q17, Q33, Q35.	62	49	Caution	Unaccpt.
Part VII – Safety & Health Organization	Section 29 – Safety and health officer	Part C-Q2, Q8.	100	0	Obey	Unaccpt.
	Section 30 – Establishment of safety and health committee at place of work	Part B-Q3, Part C-Q4, Q27, Q30.	88	0	Obey	Unaccpt.
	Section 31 – Functions of safety and health committee	Part C-Q6, Q13.	76	0	Partial	Unaccpt.
CIDB		Qs. related	Govt.	Pt.	Govt.	Pt.
Occupational Safety and Health Assessment Scheme 18001 (OSHAS 18001) Do It Yourself (D-I-Y)		Part B-Q7	32	13	Unaccpt.	Unaccpt.
Green Card		Part B-Q6	84	60	Obey	Caution

*Note: Qs. – questionnaires, Govt. – government, Pt. – private, Unaccpt. - Unacceptable

Further on, the government sector in Batu Pahat area is taking every safety aspects from minor until major to make sure it is applying into the management level until to the labor level. Though the minor problems that occurred and affected the safety regulations were mostly self-regulate especially the workers where they did not care and know about their working environment and company procedure. They just came to work and made sure get their salary each month.

For the private sectors, they were totally unacceptable. They forfeited the mostly local safety acts and standards' leaving only the CIDB's Green Card for each site staff which was in caution status where they have a very weak safety consciousness and needs immediate attention.

These meant that the private sector in Batu Pahat area, mostly did not implement safety aspect into their company or in the other meaning meant none action was taken. If they have it, just maybe a safety manual or some simple basic safety stipulations just to follow the construction regulations. In case, the CIDB and OSHA make an inspection. But in Batu Pahat area, especially the private sector, there were no such thing as inspection from CIDB and OSHA although they knew it. They just mind their own business. This is a major problem because the enforcement sector itself did not take any action, so how the private sector will obey. Besides, the management level did not work it out at the first place. They do not care about the safety aspect, but more concerned on making more profit.

Suggestions for Better Implementation of Safety and Health

As stated in Table 6.1, the government sector was very convincing in obeying the local safety acts and standards with some minor errors while for the private sector was totally unacceptable. They forfeited the safety regulations and stipulations. Therefore, here are some few suggestions to better the implementation of safety and health:

- Occupational Safety and Health Administration (OSHA) and Construction Industry Development Board Malaysia (CIDB) should make more inspection especially the private sector to ensure safety at working places are under control condition by preparing a safety and health checklist during inspection follow by ensuring each project should have a safety officer or a safety committee. If not, action would be taken to those who forfeit such as fine, black list or jail;

- A periodical maintenance should be held for occupational safety and health management system for both sectors;
- Employees from each sector should attend more safety program that is recommended by the safety departments to gain more knowledge so they could prepare a more quality occupational safety and health management system. With this exposure, the employees would understand and realize that a safe working environment will guarantee the worker safety from accident;
- For the site workers either from government sector or private sector, especially the foreigners, the employee should ensure these workers have a valid working permit that have been approved by the government follow by assuring they are expose to safety programs at site such as seminar from CIDB and get their Green Card. It is to assure not much problem occur at site; and,
- Employer especially the private sector could organize a special course related to safety. It could be held monthly or once three months. This course, the workers would be given a briefing talk from the safety officer about how important is self safety to us during working period. They also would be guide to use variety of equipment such as handy machine or heavyweight machine in the correct techniques and methods follow by guide how to use personal protection equipment (PPE) during work.

Conclusion

This study had identified the different between the government sector and private sector in how they implemented the local safety acts and standards into theirs projects by recognized and acquired the problems. (Refer to Table 5) From this study, the comparison of local safety acts and standards between the government sectors was quite impressive with averaged 77%, though not perfect; the implementation safety and health occupational while for the private sectors was a disappointment with averaged 17%. Obviously, the government sector is taking the safety aspect as a serious matter while the private sector, safety is nothing.

These are a few reasons that could be concluded for safety aspect in the government sector:

- They obey the safety stipulation as it is compulsory for every involved industries area;
- Very important because unsafe acts could cost injury or live;

- Very concerned about occupational safety and health;
- Understand that safety and work progress are interdependent;
- Usually their project involved a large sum of money and staff, therefore safety assurance is a must; and,
- As a good example for others construction company.

While for the private sector, the reasons that could be concluded for safety aspect are:

- Making profit is their first priority;
- Depend on size and cost of project (mostly housing projects);
- Mostly own business, not willing to waste money;
- Feel that safety aspect is a redundant matter;
- Safety aspect should be taken care of yourself;
- Safety should depend on working experience; and,
- More concerned on work Quality Control and Quality Assurance.

To conclude, the management controls the activities of the workers. Workers look for direction and follow the lead of the site management. So actions will always speak louder than words, so unless the site management provides and implements a genuine interest in safety consciousness in preventing accidents, workers will continue to take chances, use defective tools, violate rules, and perform unsafe acts.

We all shall know that construction work is dangerous work; the dangers can be controlled or eliminated if the management system and the authorities take seriously to implement the job-

site safety program in any resort. Preventing accidents will protect workers, save the company money, reduce waste, and prevent costly lawsuits. Planning for safety protects workers from injuries and illness, while saving every construction company's most valuable resource – skilled workers, which meant a safe job environment in the other hand, is a productive job.

With realization about the safety consciousness will reduce the number of accident/incident at site. A safe working environment is always likely to be a quality workplace. These will ensure all the parties whom involved in this field know and understand about their duty and responsibility at site in the first place. Understanding safety consciousness meant understand all the factors or elements in the safety program and how each of it contributes to protecting all the parties involved in this field respectively. These can be defined that safety and parties involved are interdependent.

Finally, there are a few fundamental values of safety that could be share:

- Safety is a corporate value;
- Safety is incorporated into the production process;
- Employees must be engaged in the safety process;
- Management participation in the safety process is key;
- Zero injuries is an achievement goal; and,
- Despite business swings, safety must remain constant.

Table 5: Problems Recognized and Acquired at Construction Site in Batu Pahat Area

Section	Statement	Problems	
		Recognized	Acquired
Part B	Knowledge based on OSHA and CIDB	Not very convincing (<i>Private</i>) Better knowledge (<i>Government</i>)	Both sector quite weak in knowledge about OSHAS 18001
Part C (Section 1)	Planning and organization	None safety policy and nothing have been done (<i>Private</i>) Have safety policy and implement safety aspects (<i>Government</i>)	Low cost project e.g. mostly housing project. (<i>Private</i>) Not 100%, because of employee behaviors. (<i>Government</i>)
Part C (Section 2)	Safety & Health Implementation in Job Consciousness	Average and did not take this matter seriously. (<i>Private</i>) Obeyed and implemented the actual procedure. (<i>Government</i>)	Exposure of safety aspects from both sectors based on the upper management.

Table 5: Problems Recognized and Acquired at Construction Site in Batu Pahat Area (cont.)

Section	Statement	Problems	
		<i>Recognized</i>	<i>Acquired</i>
Part C (Section 3)	Safety & Health Implementation Relating to Equipment / provision	Done nothing except having sufficient equipment. <i>(Private)</i> Taking every safety aspect on their daily equipment. <i>(Government)</i>	The management never provided any equipment safety programs for the labors. <i>(Private)</i> Only minor error by the self-irresponsible and job-negligence of the labor. <i>(Government)</i>
Part C (Section 4)	Management and working behavior	Never ever take any safety aspect in the management <i>(Private)</i> Perform well in managing occupational safety and health. <i>(Government)</i>	First step never taken, so the following safety aspects were weak. <i>(Private)</i> Providing sufficient safety facilities, sufficient supervision and command around the site. <i>(Government)</i>
Part C (Section 5)	Workers' Behavior	Majority of respondents from both sectors have strong support.	The labors misjudge and misevaluate safety aspect although they understand the importance of safety. Main factor is self-regulate that matter most.

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