



THE ROLES OF CLIENTS IN ENHANCING CONSTRUCTION SAFETY

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ABSTRACT

Construction sites have long been accepted by the public as one of the most hazardous workplaces. Despite the establishment and enactment of safety laws and regulations in the past decades, the industry still struggle to shed its poor safety image. However, the industry has been trying harder than ever to stop the rot in the last few years. Rather than passing the bucks to the Government, there is now a forceful drive by the clients, designers, contractors and sub-contractors to combine their efforts in order to reduce accidents on site. Gone are the days where the majority of safety issues and elements are expected to be borne by the contractors. Client organisations in particular, have shown more interest in improving safety records on their project sites. Traditionally, in order to avoid economic losses and legal entanglements resulting from injuries, they always shift the safety responsibilities to other parties. But now, they seem to have realised that they stand to lose more than they could bargain for if they steadfastly continue to play such a passive role in these safety issues. This study investigated the client's role in construction safety. The relationship between project safety performance and the client's influence was examined, with particular emphasis on the selection of safety-minded contractors, contractual safety requirements, and the client's proactive involvement in safety management. It is concluded that the client's involvement can significantly influence project safety performance. Clients can achieve better project safety performances by setting safety objectives, selecting safe contractors, and participating in safety management process during construction period.

Key words

Safety Performance; Safety Management; Construction Industry.

1. INTRODUCTION

Traditionally, construction safety responsibilities mostly rest on the shoulders of contractors. Building clients and designers were reluctant to get involved in construction sites safety to avoid from exposing themselves to wider legal liabilities. However, recently, more and more parties in the construction process have come to realise that, zero accidents is indeed, an attainable objective. Clients, designer firms, and contractors can complement each other by playing different roles in preventing accidents to achieve an injury-free worksite. The contractors are, without doubt, still the main party to plan and control construction site safety. Designers can reduce safety hazards in the working environment by considering workers safety issues in their design decisions. And now, after years leaving safety issues to the professionals, the clients are more willing to get involved in site safety discussions. They have come to realise that the costs of construction accidents would ultimately be borne by them. They also recognised the fact that, after undergoing various painful learning experiences, they cannot disassociate themselves from the legal liabilities in relation to workers' injuries. It is believed that this sudden shift in attitude was precipitated by the high profile case in 2005 where a consultant was impaled to death by a wayward fallen mould in the vicinity of a construction site. As a result of this event, clients started to place more importance on safety in their contractor selection criteria. They also insisted contractors to allocate sufficient safety provisions in the construction contracts. A look into socso's statistics on industrial accidents and deaths on construction site for the year 1998 to 2004 revealed a disturbing picture of the state of health and safety in the industry (perkeso, 2006). Although the death rates had gradually decreased from year 2001 to 2004, the near-misses safety cases are still relatively high than what was planned by the

authorities. The following questions still cannot be answered satisfactorily by the people in the construction industry' health and safety programmes:

- ✚ What are the current practices to curb the accident rate in the construction industry?
- ✚ Are the clients and management committed to curb the construction safety problem?
- ✚ Besides enforcing the OSHA 94, what can clients do to influence construction safety?
- ✚ What are the tangible benefits of implementing construction safety management for both clients and contractors?

Therefore, this paper is attempting to explore the below objectives which are (i) To identify the influential factors that can lead to clients' involvement on project safety performance, (ii) To review how clients can efficiently promote safety performance on their projects and (iii) To investigate how contractors respond to the clients' active involvement in the overall construction safety management. This research is limited only to a small group of construction clients and CIDB-registered large construction firms in Pulau Pinang.

2. A REVIEW OF THE ACCIDENT OCCURRENCES IN THE MALAYSIAN CONSTRUCTION INDUSTRY

Accident data obtained by the PERKESO (Pertubuhan Keselamatan Sosial) or Social Security Organization statistics (1995 - 2004) recorded the construction industry's high fatality rate in comparison with other major economic sectors (PERKESO, 2006). The construction industry recorded the second highest fatality incidents that happened in 1999 and 2000. Ranked second after the manufacturing sector at an alarming rate of 17%, the position is somewhat an understatement due to the higher GDP figures of the manufacturing industry. Although the construction industry's fatality rate had improved in year 2001 and the following subsequent years, it still maintains a high fatality rate. A construction employment statistics compiled by the Construction Industry Development Board (CIDB) revealed that construction workers constitute about 3% to 4% of the total workforce in the country, but yet, the industry generally accounts around 11% of all industrial workers fatalities (DOSH, 2007). In light of this significant figure, it is apparent that the industry has a challenging task to reduce the escalating construction site accidents in their hands. The existing implementation framework already places a great emphasis in enforcing the safety laws and regulation. Besides these initiatives, clients can play a pivotal role to ensure a smooth transition towards excellent health and safety programme.

3. CLIENTS' ACTIVE INVOLVEMENT IN SAFETY

The benefits that could be accrued by the clients in running accident-free construction sites are immense. A study conducted by Coble (1992) showed that the average worker's compensation insurance costs could be conservatively estimated at 3.5% of the total project cost. In addition to the high costs of workers' compensation payments, the higher dollar value settlements in lawsuits, the increased amounts of OSHA fines for safety violations, and the adverse impacts of poor safety performance on the corporate image should become the catalyst for all people concerned in the industry to increase safety on sites. In order to reduce and eventually eliminate construction accidents, researchers have explored techniques to meet the 'zero injury objective'. All the techniques proposed have one mutually shared factor – the involvement of client to make the (selected) technique a success. It is now clear that, an important prerequisite attribute to excellent safety performance is the participation of the Client not only in pre-project planning including financially supporting the contractor's safety program, but also in the day-to-day project safety activities. The construction accidents are caused by different responses to certain constraints and the environment on construction projects. Client responses are the actions (or inactions) of the Client in response to constraints during the development of a project brief (Duff, 2000). These include, reducing the project budget, adding new project criteria, changing project objectives, and accelerating the design or construction efforts of the project. All these elements play an essential role in accident occurrences. There is now a general consensus among construction professionals that says, clients is now more concerned about construction safety. With this, a new challenge arises – to what extent the clients should be involved in the formulation of health and safety programme? If the client is too engrossed on the planning and implementation, they might overrule sound professional judgements made by the consultants and of course, this could lead to failure of the programme. On the other hand, if the client decides to step back and look from afar, the construction consultants might not be able to wield enough authority to push through the initiatives throughout the project teams. Because of these repercussions, the design team and client needs to sit down and discuss what are expected from each party to make the programme a success.

4. HOW CLIENTS TAKE THEIR ROLE IN SAFETY

Clients can actively impact construction safety by selecting reliable contractors, addressing safety issues in design, and participating in safety management during construction (Hinze, 1997). To make the suggestions a reality, clients, through their project representatives should participate with the contractors in all project safety activities, including new employee orientation, safety meetings, audits and accident investigations, training, incentive programs and other safety related programs (Gambatese, 1996). One of the earlier studies on the clients' role in construction safety by Levitt et al., (1998) concludes that construction clients who select and pre-qualify contractors based on safety performance, and /or who involve in construction safety management, had fewer accidents on their projects. The client's involvement in construction safety management not only reduces the number and severity of accidents but probably also reduces their total liability exposure. Clients can actively address safety by engaging in the following activities:

1. establish and communicate attitudes towards safety
2. consider safety in contractor selection
3. develop contractual safety arrangements
4. address safety during design and constructability review
5. participate in safety dialogues during construction
6. implement total safety culture and behaviour-based safety

5. THE RESEARCH METHODOLOGY

This research was conducted in two phases. The first phase is the review on accident facts and the impact of client's role in construction industry in Malaysia. The study is a case study that involves selected clients and contractors operating in Penang. Thirty clients and ten contractors were interviewed and surveyed using questionnaires. The questionnaires were mailed before the interview to the respondents to get better quality answers from them. The second part of the research was the survey of project clients with regards to construction safety management issues. The questionnaire attempted to explore the awareness, commitment and knowledge levels of construction clients and contractors concerning safety. The clients need to respond to four sections of the questionnaires. Section A consists of general questions of company background, safety records, construction project cost, construction safety budget, etc. Section B consists of questions on safety coordination of the client. Section C consists of questions on safety management practice in projects and finally section D consists of questions on safety in design and other matters. On the other hand, the contractors were asked to provide suggestions for client to better cooperate with them in promoting construction safety. The data were then computed and analysed descriptively using the *Statistical Package for Social Sciences Software* (SPSS). The finding of the study is reported in the following section.

6. ANALYSIS AND FINDINGS

This section reports the analysis and finding of the survey. The analysis and discussion of findings are divided into two; 1) from the client's perspective, and 2) from the contractor's perspective.

6.1. FINDINGS FROM THE CLIENTS' PERSPECTIVE

Based on the survey conducted, in terms of project context of the responding clients, the annual construction project cost is taken into consideration primarily notwithstanding the company sizes and its structures. It can be categorised into two groups: clients with project value of more than RM20 millions; and those clients with project value no more than RM20 millions. However, this study found that the difference in project values is not a significant factor influencing the clients' concern for construction safety.

6.1.1 COMMITMENT OF THE CLIENTS TO CONSTRUCTION SAFETY

Commitment of the clients to construction safety was measured by two questions that deal with the earliest time the client began to emphasise safety on the project, and the philosophy held by the client concerning the responsibility for safety. The findings reveal that 30% of the clients included safety aspects as part of the project performance review, and the majority of the construction clients in Penang and Butterworth had voiced their concerns of having to equitably share the liability for safety with the contractor, and to cooperate with the contractors on safety matters. This study further found that 80% of the construction clients feel that they have the responsibility to cooperate with contractors in promoting construction safety during work execution. Furthermore, a majority of the clients are aware that it is their duty to ensure safety, health and welfare at work of all their employees as stated in the OSHA (Occupational Safety and Health Act) 94.

6.1.2 Selection of Safe Contractors

A majority of the client respondents (65%) indicated that they consider the potential contractors' safety records during the selection process. In addition, it was found out that 50 % of the clients saw that safety factor is a determinant in the overall performance assessment of their contractors. This could be due to the fact that clients are more concerned of workers safety during work execution besides delivery construction project on time, quality and budget.

6.1.3 SAFETY REQUIREMENTS IN THE CONSTRUCTION CONTRACT

This study found that all the clients include safety requirements in their construction contracts, namely, OSHA 94 and other safety regulations. This result indicates that all clients require their contractors to comply with OSHA 94 and other safety regulations. However, less than 25% of the clients require contractors to submit safety plans to them to be approved, as well as to report to them all OSHA recordable injuries. In addition to that, only 15% of the clients compel contractors to station one full time qualified safety supervisor on site. It should however be noted that, the practice of submitting OSHA recordable injuries data to building clients was only applied recently. This might explain the low acceptance rate in both contractor and client organisations. This procedural submission should be lauded because it adds a further dimension into the safety system of the clients and contractors.

6.1.4 SAFETY MANAGEMENT INVOLVEMENT OF CLIENTS TAKEN DURING CONSTRUCTION

This study found that the clients have noble philosophy on construction safety and a tendency of selecting more safe contractors for their projects. In terms of safety management involvement of clients to promote construction safety on site, it was discovered that 60% of the clients conduct periodic job site safety inspections or safety audits; 50% of them participate in some contractor safety meetings; and 20% of them participate in the investigation of all lost workday injury accidents. Further, three percent of the clients employ safety personnel on the project site to monitor injury incidence rate. Although the percentage is relatively small, it serves as a good example to other clients to properly manage human capital in terms of safety. Client's involvement in the construction safety management practice during work execution can only be good towards improving site safety.

6.1.5 SAFETY TRAINING AND SAFETY IN DESIGN

Safety training and safety in design are two areas of focus in this survey, namely to explore how clients address safety training in their projects. The clients were asked whether: their safety representative attends safety orientation; they include monetary allocations for safety training; they promote safety in design; and basic safety trainings are provided to all workers. Interestingly enough, this study found that all respondents had attended site safety meetings at some point in their careers. This finding seems to suggest that the clients are now more interested to get involved in the construction safety planning. Although only five percent of the clients allocate contractor's employees training in their budget, it is still a respectable figure considering the fact that there is no interest in safety a decade ago. This study further reveals that the clients are more concerned about safety after bidding and after the start of site work. More than 70% of the clients emphasize safety during the project execution stage. This indicates that the clients have a strong belief that they can address safety as early as the design phase of a project.

6.1.6 Ranking of Different Safety Approaches

It is evident from this study that there are significant differences between the priorities of safety approaches among the clients. The clients were asked to rank five approaches. From the survey, 'Clients to Select Safe Contractor to Carry out Work's approach was rank first by the clients. "Client participates in and monitors safety during the whole life of a construction project" and "Client emphasizes safety and construction in design" become second and third most prioritize approaches by the clients. The fourth approach as perceived by the client is "Client develops an effective safety recognition and reward program". The approach of "Client dedicates funds to support the contractor's effort in safety" becomes the least priority to the clients.

6.1.7 SUMMARY OF THE CLIENT'S PERSPECTIVE

Based on the analysis of the survey, this study deduces that the annual construction expenditure seems to be an important indicator of the seriousness of clients in tackling safety issues in their projects. Clients with larger construction budgets are more concerned about construction safety. The clients with better safety performances tend to emphasise safety during the earlier stages of project development. They will emphasise safety performance more during the selection of contractors, and they will also include more safety requirements in their contracts. The clients with safer projects tend to be heavily involved in project safety management, especially by implementing various approaches to promote safety management. Although these approaches may not be extensively used in the construction industry, they are widely implemented by safe clients with large construction budgets. Instead of trying to contractually avoid liabilities from injuries, clients with

safer projects tend to be more involved with contractors on project safety management, especially safety training. Clients who place greater emphasis on safety tend to address safety in the design of their projects. Among different approaches taken by clients to achieve success in project safety, clients proactive on safety tend to believe that selecting safe contractors to construct their projects and emphasising safety in the design phase are important.

6.2 FINDINGS FROM THE CONTRACTORS' PERSPECTIVE

This study also surveyed the contractors to ensure a degree of consistency in the client findings. The respondents from the contractors are safety managers or project managers at the project level, who were familiar with safety management. It is evident that all respondents have a long history of working in the construction industry and are reasonably experienced. The following sections report the findings of the survey.

6.2.1 THE CLIENT'S INVOLVEMENT IN PROJECT SAFETY MANAGEMENT

The study surveyed the contractors about the involvement of clients in project safety management from various aspects. These questions concern the responsibilities clients assume, level of importance that clients place on safety, and whether or not clients provide adequate support for safety on their projects. The research found that 30% of the safety responsibilities are assumed by the clients. However, the interviews reveal that although the overall involvement is generally modest, the respondents perceived that clients' overall involvement in safety had steadily increased in recent years. The examples of increased involvement of clients as perceived by the contractors include:

- a) Safety representatives of clients are generally assigned to each project;
- b) Participation in safety incentive programs;
- c) More limitations on bid lists based on safety performance;
- d) Participation in weekly safety audits;
- e) Detailed and constructive reviews of contractor health and safety programs;
- f) Require contractors to have a JSA on all project and tasks to be done, in addition to contractor's pre-task checklists;
- g) More involvement in day-to-day activities
- h) Do not view contracted work as contracting away responsibility, but rather that the contractor is an extension of their internal workforce who possesses unique skill set or has access to labour providers;
- i) More stringent reporting requirements, more emphasis on training and orientation;
- j) Higher standards are generally enforced, little or no tolerance for substandard practices;
- k) Assumption of responsibilities by management and supervision;
- l) More emphasis on behaviour based safety.

6.2.2 LEVEL OF IMPORTANCE THAT CLIENTS PLACE ON SAFETY BEFORE AWARDING A CONTRACT

It was revealed that the contractors thought that cost is the most important concern for many clients, with quality the second, followed by schedule and safety in the order of importance. When asked to comment on health and safety after working with many types of clients, the contractor respondents list the following statements:

- a) How concerned they are about human welfare;
- b) Contractors are able to provide the proper level of safety support for their employees if adequate funds are available to support it;
- c) more interested in a good record than how it was achieved;
- d) varies from clients to clients;
- e) a wide range in the level of support coming from the clients;
- f) each client has a different approach

6.2.3 HOW CAN CLIENTS FACILITATE CONTRACTORS IN PROJECT SAFETY MANAGEMENT

The contractors' expectations on the clients' involvement in safety planning and management are also investigated in this research. Five expectations were revealed, which is as follows: safety training, safety inspections, safety incentives, accident investigations, and job hazard analysis. However, the contractors also expect other facilitations from the clients that include the following:

- a) Behavior based safety incentives.
 - b) Show leadership in safety.
 - c) Reduce double standard, same rules for contractor employees and Client employees.
 - d) Contractor review, comparison.
 - e) Overall support, being visible and participating.
 - f) Contract terms and conditions combined with full compliance.
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- g) Complete engineering and develop a schedule that is reasonable and able to be accomplished safely.
- h) Leadership.

6.2.4. SUMMARY OF THE CONTRACTORS' PERSPECTIVE

It is evident from the survey that clients' involvements in construction safety are highly sought by the contractors. The contractors opined that the clients should be actively involved in safety management of projects. The survey conducted in this study also found that there should be a standardised training on health and safety for both the contractor and client employees to ensure a consistent flow of information and knowledge. The contractors also called for fairness and equitable actions. They thought that, once safety regulations are developed, they should be implemented firmly and consistently.

7. CONCLUSIONS

There are rooms for improvement on Malaysian construction safety performance an all stages of project – from project conception until project completion and hand over. All parties in any typical construction project, namely, the client, designers, and contractor must contribute into the planning and management of safety on construction site. It can be concluded that the client's involvement can significantly influence project safety performance. The findings show that clients play a prominent role to institutionalise safety culture into construction project teams. The clients can influence the safety management and safety commitment of the designers, contractors, and subcontractors in various means. Clients can influence project safety through communicating safety, selecting safe contractors and participating in safety management. At the core of the client's involvement is the zero injuries objective. Clients should consider using various evaluating measures of safety performance when selecting contractors, i.e., when setting performance objectives, monitoring safety performance, and participating in project safety programs. These measures include risk involved in the construction process, overall quality of safety program, management safety commitment, qualifications of project management team and safety personnel, worker participation, safety observation results, near misses, and *etc.* Clients can help promote safety performance by implementing a carefully designed, dynamic safety program. These programs can serve as a viable model for the contractor to emulate. By being directly involved in project safety management, many proactive clients have achieved excellent safety performances. It should be noted that the involvement of clients in construction safety management should be a continuous and integral effort. Simply implementing some proactive safety practices cannot guarantee a safe project. Client's concern and participation in safety should start from the very beginning of the project design until the completion and even the operation and maintenance of the project. Safety management should be a dynamic and flexible effort with a firm safety philosophy of zero injuries. Safety should not consist primarily of a safety manual left on the table or in the statistics that are generated. The safety program should be changed with reference to the site conditions and the dynamic evaluation of safety performance (e.g. safety observations, near misses, safety inspections). While the specific practices implemented on the construction project can vary, the safety program should be implemented consistently and firmly once developed. There should be no grey area in safety management. A behavior or condition can be either safe, or unsafe. No unsafe behaviors or unsafe physical conditions should be ignored or tolerated. Referring to the results in the study, the zero injuries objectives is attainable, particularly with the client's proactive involvement in safety. The survey conducted to the contractors revealed that the developers can significantly influence and improve construction safety performance by participating in the contractor's safety programs. The clients' role in construction safety can then be defined as the party to oversee and facilitate safety management on the project. Clients may not always take the leadership role for project safety management, but the client's attitude towards safety and their physical involvement in safety will favourably impact the safety performance of general contractors and subcontractors.

8. RECOMMENDATIONS

All clients, regardless of the type and size of their projects, should recognize that they have a responsibility for construction safety. Safety should be integrated into the overall project objective of the client. The influence of clients on designers and contractors was not thoroughly explored. Further research is suggested to develop a fuller understanding of how clients can impact the way designers address safety in their designs. Research is also needed to address constructability issues and to establish how clients can facilitate contractors in their efforts to implement safety programs. For example, more information is needed on how clients can work in concert with contractors by combining their safety programs. These studies could be conducted at both the company level and the project level. Thus, fuller picture could be generated on how to achieve better safety performance.

While it is assumed that the findings of this research apply to all types of projects, research should be conducted to confirm this. A larger and broader based research study could be focused on the role of clients on smaller projects. This would determine if the Client's role changes with the project sizes. This study does not focus on cost and benefit analysis when clients get involved in project safety management. However, the benefit of a safe project should be apparent, for example, the increased morale, and the increased productivity and so on. Future study can investigate how clients regard the benefit and cost of client's involvement in construction safety management.

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