

RESTRICTION OF THE MULTI-LAYERS SUBCONTRACTING PRACTICE IN HONG KONG – IS IT AN EFFECTIVE TOOL TO IMPROVE SAFETY PERFORMANCE OF THE CONSTRUCTION INDUSTRY?

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Introduction

In 1998, the number of persons engaged in industrial activities constituted about 28 percent of Hong Kong's working population. However, the industrial sector recorded 43,034 loss-time industrial accidents in 1998 representing 68 percent of all worked-related loss-time injuries. Of these, 19,588 loss-time accidents or 45.5 percent happened in construction industry. This accounted for an accident rate of 248 per thousand workers. The safety record of the construction industry was poor and much worse than other industries in Hong Kong. The reasons of the poor safety record may correlate with many factors such as complexity of the work or system, risk nature of works, management style, safety knowledge and commitment, and personal behavior (Stranks 1994). Surprisingly the multi-layers subcontracting practice is unique to the Hong Kong construction industry and has been the most common practice being used with long history. When a principal contractor secured a project from a developer, usually it would break down the project activity into different trades and then sublet each category to individual subcontractors with the lowest bid (Lee 1991). These subcontractors would normally further subcontract their work without the consent of their principal contractor to several smaller firms in order to minimize their overheads.

The problems of multi-layers subcontracting practice have long been an issue and a controversial subject in the industry. Recent researches (Linehan 2000a & Tong 2000) have all suggested having legislation for restricting the subcontracting practice in the construction industry for better safety performance. Although such restriction may help to improve the safety performance, it would be extremely difficult to implement in the workplace due to the traditional work practice. On the other hand, some people including Lee (1999a) and So (2000) had disagreed to restrict the multi-layers subcontracting practice. They considered that the subcontracting practice has great market values for the industry, which ought not be interfered by restriction in the form of legislation.

Previous Studies

Safety performance of the Hong Kong construction industry

It is generally acknowledged that poor safety performance of the Hong Kong construction industry is an unenviable fact. The Census & Statistics Department (1999) found that the construction industry had the highest fatalities and accident rate than other industries in Hong Kong such as the manufacturing industry, catering, transportation, storage, communication and utilities industry in the past ten years. Also, Rowlinson (cited in Lo 1997) identified that the construction industry accident rate was exceptionally high in Hong Kong, the fatality rate was 10 times higher than UK, 8 times than USA, 4 times in Japan and 2 times than in Singapore. Thus construction should be one of the most important target areas of study for accident prevention in Hong Kong.

Subcontracting practice of the Hong Kong construction industry

Recent researches (Wong 1999 & Lee 1996) have indicated that the high accident rate of the Hong Kong construction industry was related to the multi-layers subcontracting system. Lai (cited in Lee 1991) found that the number of subcontractors in one construction site might be ranged from 17 to 54. The principal contractors' direct labour force in a project was small, and the subcontractors' workforce might

actually carry out construction work without the knowledge of the principal contractor. Managing safety was a problem in terms of communication and monitoring. Lee (1999b) commented that the multi-layers subcontracting practice is common and excessive in Hong Kong. The most extreme case quoted by Lee was subcontracting up to 15 layers.

Problems of subcontractors

The structure of subcontractors is usually simple and small in size. They had neither time nor inclination to keep abreast with legal requirements or technological developments in safety. Shaw (1998) found that small business faced with specific health and safety challenge, many firms lack of adequate resources and were often struggling to survive. Furthermore, they lack an understanding of their obligations and the health and safety issues of their processes. Poon (1998) commented that the major cause of accident was that subcontractors were rewarded according to work done. They were working under tremendous time constraint, which caused higher possibility of construction accidents.

Advantages of subcontracting

Lee (1999a) however disagreed that subcontracting practice was the major cause of poor safety performance of the Hong Kong construction industry. He commented that the multi-layers subcontracting system was worth to exist in the market. Wong (1997) found that subcontracting practice could be employed to cope with long term demand uncertainty, allowing the firm to avoid the employment of a stable workforce and investments in fix resources under conditions of the fluctuating demand, serving as an external buffering mechanism, absorbing uncertainties arising from availability of resources and operational conditions.

Research Method

In order to achieve quantitative and qualitative result, both questionnaire and interview survey methods were used for the various concerned parties of the construction industry. Questionnaire survey was used for the contractor and non-contractor groups in order to collect quantifiable data to reflect the fact and norm of the industry. Thereafter, face-to-face interview was carried out to the professionals in the construction industry who have not participated in the questionnaire survey in order to provide qualitative and objective explanation for the data collected from the questionnaire survey.

Survey Results

Totally 55 out of 250 questionnaires were received, which represents a return rate of 22%. In addition, 15 numbers of professional which included 7 project managers, 4 consulting engineers and 4 safety professionals were interviewed.

Current status of the Hong Kong subcontracting practice

From the questionnaire survey, the majority of respondents expressed that they would sublet 80-90% of their works to subcontractors. None of the respondents would carry out construction works that fully rely on their own effort, at least 30% of works would be subcontracted out. The main reasons for them to subcontract works out were cost control and commercial purposes.

A contractor would normally employ over 100 numbers of subcontractors. In the current construction market, about 80-90% of construction workers are employees of subcontractors. If the subcontracting practice was restricted or regulated, it may cause a great impact to the society due to unemployment of the subcontractors and their construction workers.

The survey also reflected a common industrial practice that majority of the contractors would allow their subcontractors further sublet works to other subcontractors without controlling the number of subletting levels. They would normally not consider their subcontractors' subletting status and therefore the culture of multi-layers subcontracting practice is fostered.

As shown in Table 1, the accident rates per thousand workers of the respondents were ranged from 33 to 200. These accident figures would be used for providing trend for analysis of factors, which were affecting the safety performance.

Accident Rates provided by the respondents

33	35	42	45	47	55	55
60	61	63	77	83	91	95
100	121	160	191	200		

Table 1 – Accident Rate per thousand workers

Factors affecting safety performance

The regression analysis technique in the SPSS computing software has been used to determine the relationship among the accident rates and other variables in the survey. The calculation result of Pearson's R-value reflects the trend of factors affecting safety performance.

Number of employees vs accident rate

The number of employees in the organization is one of the factors affecting the safety performance. The calculated R-value of the accident rate and the number of employee was at -0.52 , which represented that there was negative correlation between them. That is to say a higher number of employees, a lower figure of the accident rate.

Percentage of subcontractor employees vs accident rate

The percentage of workers employed by subcontractor and the accident rate do have a positive correlation. The calculated R-value was at $+0.41$, which implied that more subcontractors' workers in an organization, poorer would be the safety performance.

Percentage of works sublet vs accident rate

The scales of works being sublet and the accident rate have positive correlation. The calculated R-value was at $+0.42$, which implied that more works being sublet to subcontractors, poorer safety performance may result.

Perception of the Industry

Most of the respondents agreed that multi-layers subcontracting practice is one of the major causes of poor safety performance and the performance of subcontractors is difficult to control. Reduction of subcontracting could help improve the safety performance of the construction industry.

However, the multi-layers subcontracting practice has been widely adopted by the industry, majorities of the respondents believed that restriction of this practice is impracticable. It is because a great impact to the local construction industry was expected as well as the free market approach by Hong Kong would be damaged.

Whether restricting the multi-layers subcontracting practice is the best solution for improving the safety performance is arguable. However, the survey indicated that most of the respondents disagreed with it.

Discussion

Problems caused by multi-layers subcontracting

The multi-layers subcontracting practice was considered as one of the major reasons for poor safety performance. The interviewees explained that subcontractors are normally small in size and simple in structure. They usually lack safety commitment because of limited budget, time and human resources. It resulted in insufficient provision of on-the-job safety training to the employees, who have very limited knowledge to deal with safety matters.

Subcontractors would rarely employ safety professional and they had no interest in safety matters because most of them believed that safety should be the responsibilities of the principal contractors. It could be explained by the fact that in Hong Kong subcontractors are usually not accountable for serious accident or for violation of safety regulations. Principal contractors would usually be responsible for

workmen compensation and penalized for safety offenses.

The short contract period and multi-layers subcontracting of works, which resulted in subcontractor who is at the lowest subcontracting level, will not have realistic profit. Hence they have to resort to sub-standard works, which will increase the possibility of accident occurrence (Leung 1997). High mobility of construction workers is also one of the major causes for poor safety performance. Simo (1995) found that subcontractors usually employed short-term workers. These short-term workers were strangers to the hazardous conditions on site and they would not take care of other workers because they do not know each other.

Assurance of subcontractors' quality and performance

It is considered that subcontractors' quality and performance were difficult to control. Subcontractors are operating as individual firms. They would have their own culture, structure, management style and business strategies. Most of the small size subcontractors have not been formed formally and most of them have only a few staff or workers. They are not well organized and therefore communication between the principal contractor and subcontractors might have problems. Meanwhile, if the principal contractor provides too much effort on supervising subcontractors, the objective of minimizing the use of limited resources would be lost.

Under the current subcontracting practice, the lowest bidder would get the contract and as a result the financial return is trivial but the risk is huge. Subcontractors have to shorten the completion time and resort to lower standard or to use unskilled or semi-skilled labour in order to save construction cost. As a consequent, the quality and performance are being affected accordingly.

Some interviewees opined that if the expected standards could be listed out clearly onto the subcontract documents, assurance for quality and performance would not be a problem. Furthermore, a suitable selection procedure for subcontractors such as pre-tender qualification is being considered as an effective tool to control subcontractors' quality and performance.

Restricting the multi-layers subcontracting practice

Most respondents considered that restricting the multi-layers subcontracting practice was impracticable. The interviewees suggested that even if the proposed strategy of restricting the multi-layers subcontracting practice was adopted, there would have no effective and reliable method to monitor whether the contractors have sublet the work out or how many layers of subcontract are being truly sublet. In addition, the expected financial impact and risk to principal contractors would be too great to be affordable if the multi-layers subcontracting practice is restricted.

Expected impacts

Over 80% of the respondents expressed that impact to the industry was expected if the multi-layers subcontracting practice has been restricted. The industry will be adversely affected. If the subcontracting practice is drastically restricted or the subcontracting levels is highly regulated, principal contractors have to employ extensive direct employees so that a large amount of routine turnover was required, and the operation cost would be greatly increased. Some contractors may be forced out of business. The society would also be affected because the construction cost would be increased and the increase in cost would eventually be transferred to end-users.

Free Market Approach

Based on the questionnaire survey, it is considered that the free market approach adopted by Hong Kong would be damaged by restriction of the multi-layers subcontracting practice. Most medium and small size contractors could not survive. If the multi-layers subcontracting practice is allowed to operate continuously, it could provide more tender opportunities and allow more subcontractors to join the competition. So that tender price would be more competitive and the construction cost could be maintained at an affordable level.

Proposed Alternative Measures to Improve Safety Performance

Strengthen the control of subcontractors

As previously discussed, safety training is considered as a key factor affecting safety performance. It is recommended that sufficient safety training should be provided to employees at all levels. Subcontractors should be held accountable for safety and they should be encouraged to employ safety professionals in managing safety matters.

Careful control and selection of subcontractor is essential that pre-qualification process should be adopted to assess subcontractor's quality and ability. The expected standards and safety requirements should be listed onto the subcontract documents as detailed as possible, and to correlate subcontractors' past safety performance with tendering opportunity.

It also suggests to replace the current practice of awarding the contract to the lowest bidder. The tender price should be assessed with special criteria. Contracts should only be awarded to those contractors or subcontractors who have submitted tender at a reasonable price.

Legislation and enforcement

It is suggested that tightening the requirement of registered safety officer such that at least one registered safety officer should be employed for each construction site. The current legal requirements of one safety officer to be employed when the total workforce is at 100 or more should be tightened. Small construction sites usually have no safety officer to carry out safety supervision.

The current Pay for Safety Scheme operates by the Works Bureau is an effective way to improve construction safety. It is an incentive scheme to compensate the safety cost incurred by contractors. Under the conditions of contract, the contractors are entitled to pay on monthly basis if they have completed the specified safety items as stated in the contract. It is suggested that extending this incentive scheme to other Government and private contracts.

The enforcement of occupational health and safety regulations is suggested to hold individual subcontractor or worker accountable. The enforcing department should prosecute those safety offenders directly.

It is recommended to implement tradesman-licensing system. Special tradesmen must gain recognized licenses before they are allowed to carry out high risk activities such as operation of plant, bend and fix steel bar, gases welding and working in confined spaces. The licensing system could ensure that high-risk tradesmen have received sufficient safety training before they start to work.

Chan (2000) commented that there was very little social security to workers, and everyone puts in extra to ensure that they can feed their family. As a result, workers either ignore or accept the danger, and in some cases they are being forced to take risk. A better safety culture for the construction industry is required. It is recommended that the Government should enhance the legal status and the negotiation ability of the labour unions and to educate workers to demand for the provision of safer plant, equipment and safer working environment from their employers.

Technological changes

The construction industry should be encouraged to widely adopt the use of pre-cast construction technique instead of using traditional labour intensive construction methods. Chudley (1985) found that the tradition cast-in-situ concrete construction method used to occupy large working area, consume more labour forces and construction materials and produce large amount of construction wastes.

Wong (2000) opined that occupational health and safety issues were often the results of lacking safety as an element or inadequate safety consideration in the design of buildings and planning of building works. Remedial safety measures are often technically more difficult, less ideal, less acceptable to employees, and cost more money than well-planned safety measures, which have been considered at the design and planning stage. Tang (2000) recommended introduction of the 'Construction Design Management' concept from Europe to the Hong Kong construction industry. Also, to request architects put considerations of design safety, construction safety and the safety of subsequent maintenance into account at the design stage. It is believed that this new management concept could help improve construction related occupational safety and health.

High mobility of construction workers is the major cause of poor safety performance. These short-term workers are strangers to the hazardous condition on site. It is therefore recommended to employ as many long-term employees as possible.

Linehan (2000b) commented that much could be achieved in quality, costs and safety through attempting to develop longer-term partnership between contractors and subcontractors. Longer term partnership enable both parties to work for good safety standards, to formulate effective means for working safely, and to develop a proper understanding of the reciprocal duties and responsibilities which exist on site.

Conclusion

The research, which was based on the perception of the survey respondents had concluded that restricting the multi-layers subcontracting practice might bring with it great impacts which is not acceptable by the majority of the contractors in Hong Kong. Without their full support and cooperation, implementation of such idea would encounter tremendous difficulties that would make the regulation not applicable. Meanwhile, the subcontracting practice has its values and advantages for the construction industry, which should not be under estimated. Linehan (2000b) commented that certain subcontracting by professional trades was unavoidable though excessive subcontracting should be minimized. Thus, the proposed alternative measures, as well as the reduction of excessive levels of subcontracting are recommended for improving the safety performance of the Hong Kong construction industry.

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