

THE INFLUENCE OF CLIENTS ON HEALTH AND SAFETY STANDARDS IN CONSTRUCTION

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The aim of this study is to investigate the contribution made by clients to health and safety standards in construction. It is argued that problems arise in this area because there are an increasing number of projects procured on a without quantities basis. The assessment of the work involved is therefore more difficult, and contractors are not able to establish their risks easily. It is also argued that risks to clients are increased as they will not be able to judge the validity of the tenders on a 'like for like' basis. The approach taken by clients to assess contractors' provision of resources for health and safety is inconsistent. Contractors may be appointed that have not fully considered the health and safety aspects of projects, and may not have included sufficient funds in their tender bids to complete the project safely. The key objective is to determine the influence of clients' use of health and safety criteria at tender stage on standards of health and safety during the construction phase. The main research instrument is a postal questionnaire survey, which collates quantitative data. The population for the study is practising construction clients in the commercial sector. The reliability and validity of the study are considered. Inferential statistical techniques are used to test the hypothesis. Two main conclusions are given: (1) construction clients should state that health and safety is a key criteria to be considered in judgements about a contractor's performance, and (2) standards of health and safety could be improved by educating clients. Recommendations include further investigation to establish who is best placed to advise clients on matters of health and safety and a further study to assess the relationship between contractors' health and safety performance and their overall project performance.

Keywords: client, contractor selection, health and safety, tendering.

INTRODUCTION

There is a commonly held perception in the construction sector that the industry is price driven. That is to say that projects are awarded on the lowest tendered price and not enough consideration is given to other factors such as contractors' health and safety management proposals, their ability to achieve the required quality standards or complete the contract within the required timescale. Rethinking Construction – the report of the construction industry task force' stated that 'too many clients are still indiscriminating and still equate price with cost, selecting designers and contractors exclusively on the basis of tendered price' (DETR 1998: 10). The result of this situation is that contractors who have developed the most appropriate management solution with regard to health and safety on projects may not be selected if their bids are not the lowest. Consequently the risk of accidents during the construction phase

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may be higher which could lead to personal injury, loss, property damage and subsequent delays and costs to the project.

Clients have a key role in setting the standards for the health and safety culture on construction projects. If a client has a cavalier attitude to health and safety, then it is likely that everyone on the project will develop a similar approach (Perry 1999: 20). The legal requirements for contractor competence assessment, and ensuring that contractors have allocated sufficient resources for projects are sometimes not given enough consideration. Contractors who are appointed may not be technically competent to carry out the work or may not have fully considered project risks and therefore under priced the works. This will force contractors to look for cost savings during the construction phase and could lead to health and safety being compromised.

In the year up to April 2001, 106 workers were killed on construction sites (HSE 2001). The cost of accidents is difficult to determine. A study by HW Heinrich in 1931 assessed the costs of accidents to industry. Heinrich distinguished the costs covered by insurance, such as compensation paid to the injured party, the direct costs and all other costs associated with the accident, which he termed indirect costs. Indirect costs averaged four times the value of direct costs. This finding has been extremely influential and has been applied by many companies and risk analysts as a rough rule of thumb to estimate the cost of accidents to individual firms (HSE 1994: 5).

It may be said that the root cause of the problem is the competitive tendering process. Many construction projects are procured using the procedures outlined in the Code of Procedure for Single Stage Selective Tendering (CPSSST 1989). Farrow (1996: 3) found that it was the view of the National Joint Consultative Committee (NJCC) and the former Department of the Environment that single stage selective tendering was the most appropriate method for letting building contracts.

The code anticipates the use of bills of quantities and requires the design to be substantially complete. Many projects are procured on a 'without quantities' basis using plans and specifications (RICS 2000). This does not allow contractors to fully assess the extent of the works and hence include for all necessary costs. They could have their own bills produced but this is difficult in a short tender period, and it increases the already high cost of tendering. The same can be said of design; if a design is incomplete then contractors cannot fully evaluate risks. Contractors' estimates of cost and the method to be adopted to undertake the proposed works will be based on the accuracy and sufficiency of the tender documentation. If the documentation does not reflect the true extent and nature of the work the contractors' risk is increased significantly (Farrow 1996: 3). It can also be said that risks to clients are increased as they will not be able to judge the validity of the tenders on a 'like for like'. The CPSSST anticipates a minimum period of four weeks for the tenderers to prepare their bids. This duration should be increased to suit project complexity and size, and if it is a 'without quantities' arrangement to allow contractors to get bills prepared.

This situation raises the question of how do clients fulfil their legal duty to ensure that contractors have allocated suitable and sufficient resources to undertake the works if contractors have been provided with minimal information and time to tender. Perhaps clients should request detailed information from contractors regarding the resources that have been allocated and the proposed method of construction. Clients and members of their professional team may interview contractors regarding their

proposals. Potential contractors can be questioned in depth to ensure that they have fully understood and resolved the health and safety issues of bespoke projects. Clarke (1999: 284) suggests that in order to fully assess contractors' appraisals of the health and safety requirements of projects Health and Safety Plans must be suitably developed and submitted with tenders. This however, rarely happens in practice. There is no legal requirement for the submission of developed Health and Safety Plans at tender stage and if there are several contractors tendering there is a large degree of uncertainty as to whether the contract will be won. Therefore, contractors maybe unwilling to commit further time and cost to the already expensive tendering process in preparing further formal documentation.

THE LITERATURE

CDM Regulations 1994, Regulation 9.3 states:

“No person shall arrange for a contractor to carry out or manage construction work unless he is reasonably satisfied that the contractor has allocated or, as appropriate, will allocate adequate resources to enable the contractor to comply with the requirements and prohibitions imposed on him by, or under the relevant statutory provisions”. (HSE 2001: 69)

In developing CDM, HSE recognised that clients have a tremendous influence on the planning, organization and implementation of construction projects. For the first time the regulations introduced legal responsibilities for clients in respect of ensuring provision is made for health and safety on construction projects (Perry 1999: 20). Whilst it took until 1994 to get the construction clients' duties for health and safety established into English law the essence of CDM has been around for thousands of years:

“When you build a new house, you shall make a parapet for your roof, that you may not bring the guilt of blood upon your house, if anyone fall from it” (Deuteronomy, C 23, V 8) cited in (Caldwell 1999: 1).

A paper by Sandra Caldwell, former HM Chief Inspector of Construction reported on the findings of HSE focus group meetings on the CDM Regulations. The feedback from some 350 delegates was that the regulations were sound and have had a substantially beneficial effect on construction health and safety management (Caldwell 1999: 8). However, Perry (1999) highlights the confusion that has surrounded the regulations since their introduction, and because of this it is noted that CDM is currently under review (HSE 2002)

Rethinking Construction (DETR 1998:17) identified that people are the most important asset in a business and called for better standards of health and safety for the workforce, better training and site conditions. It is important to recognise the benefits that can come along with good health and safety management. By following the appropriate guidance and codes of practice duty holders will satisfy the requirements of the law. Good health and safety practices can perpetuate not only good on-going practice, but also enhance work enjoyment, individual and group satisfaction and lead to improved productivity. People who are interested and committed will undoubtedly work in an environment of greater awareness and take care not only of themselves but also of others (Griffith and Howarth 2000: 129). This view is supported in CIRIA report 'Selecting Contractors by Value' (1998: 43), which suggests that a contractor's approach to health and safety provides an indicator of the degree of responsibility and skill that will be exercised in the project more widely.

Good health and safety management should not be differentiated from good management generally. It requires a systematic approach and careful planning. It also requires long-term investment in training and development of employees. It is an issue of culture within an organization that must start with the most senior management.

The HSE Contract Research Report, CRR 387, 'Improving Health and Safety in Construction' suggests that client procurement strategy is an influencing factor in accidents in construction (HSE 2001).

There are twenty-eight recognised variants of traditional tendering (Clarke 1999: 296). Single stage selective tendering involves clients having drawings, bills of quantities and specifications prepared for the proposed project then inviting contractors to price these documents on an open basis, where there is an unlimited number of tenderers, or, more usually, inviting a select list of contractors to price who have previously been pre-qualified. In an effective qualification process threshold levels of competence and capacity are established that ensure that only contractors who are capable of doing the work are considered for the project (CIRIA 1998: 53).

The tender documentation must be sufficiently detailed to allow contractors to ascertain the nature, complexity, scale, scope and quality of the work to be achieved (Clarke 1999: 276). Contractors then estimate the cost of the project and submit a lump sum price for carrying out the works. The client then selects a contractor based on the prices submitted. Rethinking Construction (DETR 1998: 10) stated that too many clients are indiscriminating and still equate price with cost, selecting designers and contractors almost exclusively on tendered price.

There are several problems with this method of construction procurement. Firstly, the level and detail of the information upon which contractors are expected to prepare their cost estimate. The CPSSST recommends that the design be substantially developed and bills of quantities and specifications are produced for the tender. If information does not reflect the true extent and nature of the works, contractors' risk is increased significantly and there is the concomitant risk to clients of receiving final accounts for projects significantly different from original tenders (Farrow 1996: 3). It is the obligation of clients to provide tenderers with precise requirements of the works to be undertaken. The level of information impacts on the contractors' ability to assess the necessary resources required for projects, a key requirement of the CDM Regulations. If contractors cannot establish the scope and extent of the works how can they allocate adequate resources? Clarke concurs that the address of adequate resources is sensitive to the level of information provided for pricing (1999: 296).

Secondly, the time allowed for the preparation of tenders is often inadequate. The CPSSST recommends a minimum of four weeks increasing to six weeks for projects of greater complexity. Research published in Farrows 1996 report 'Use and abuse of the Code of Procedure for Single Stage Selective Tendering' found that only two weeks was being allowed for projects up to £1 million, and one contractor reported a three week tender period for a £ 20 million project. Generally it was found that professional advisors thought tender periods were acceptable, however, contractors thought that periods were much too short (Farrow 1996: 6).

Clarke suggests a model for how a four-week tender period is utilized in reality. Effective work by contractors on tenders is been done in approximately two days with off site assistance from subcontractors and suppliers. Clarke says that tenders are contractors' best guesses of prices they think they need to quote to win the work (Clarke 1999: 289-290).

Partnering arrangements were one of the key recommendations of Constructing the Team (DETR 1994). Guidelines were suggested for the fundamentals of partnering including; a specific duty for all parties to deal fairly with each other, their subcontractors and suppliers, in an atmosphere of mutual co-operation, a choice of risk allocation appropriate to each project according to the party best able to manage each risk, encouragement of incentive mechanisms for exceptional performance and mechanisms for the avoidance of conflict and speedy dispute resolution (ACA 2000: 1). In February 2002, CIOB reported that there is currently £2 billion of construction work administered using the 'Association of Consultant Architects Standard Form of Contract for Project Partnering (CIOB 2002: 15). Because partnering is a part negotiated arrangement contractors should be able to adequately price health and safety in projects. Whilst this is all well and good in partnering systems of procurement, problems of health and safety still need to be addressed in competitive tendering.

The purpose of regulation 9.3 of CDM was to put a check in the procurement system to ensure that projects are being priced to include safety and to ensure that clients contribute to the health safety and welfare of all who work on site.

Arising from the problems above and the literature, the following research hypothesis was established: Clients' use of health and safety criteria at tender stage (independent variable) influences the standard of health and safety during the construction phase (dependent variable).

METHOD

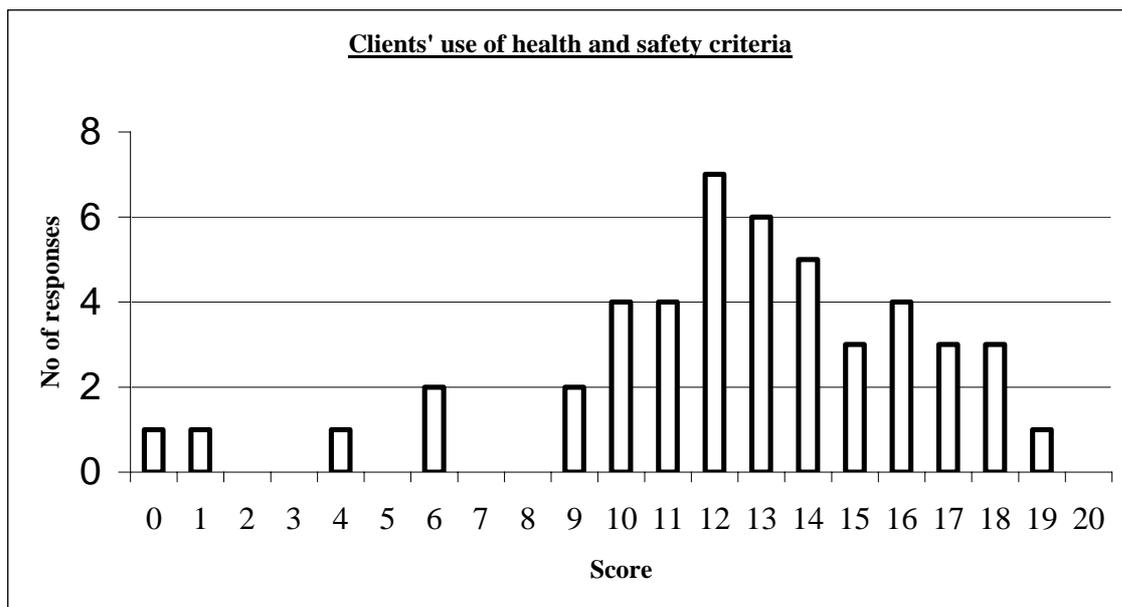
The main research instrument was a postal questionnaire distributed to clients operating in the Northwest of England in the commercial market who have had projects completed in the year 2000 with a minimum value of £500 000. Wording of questions were validated by construction professionals prior to it being distributed. ABI Building Data Ltd provided a database of 800 clients who matched the population criteria. 200 clients were randomly selected for the distribution of the postal questionnaire. Forty-seven questionnaires were returned in time for analysis, representing 23.5% of the total distributed. The data received was analysed using quantitative techniques. Inferential statistical tests were carried out to test the main research hypotheses and sub-hypotheses regarding subject variables. The independent and dependent variables were each measured using five closed questions. The responses were assigned a numerical value from 0 to 4 and totalled to give a totalled summated score (Bryman and Cramer 1997), the minimum score being 0 (zero) and the maximum score 20. For the independent variable 'clients' use of health and safety criteria at tender stage', the questions were frequency based, with possible responses being never, rarely, sometimes, often, always. The questions were, how often do you: (i) request health and safety proposals from tenderers, (ii) use health and safety criteria in judging tenders, (iii) explore health and safety issues in pre-tender interviews, (iv) award contracts to tenderers who are not lowest price, and (v) interview other tenderers, if the lowest priced bid is not adequate in respect of health and safety. For the dependent variable 'the standard of health and safety during the construction phase' the respondents were asked to rate standards as very poor, poor, acceptable, good or very good. The questions were about: (i) welfare, (ii) site tidiness, (iii) training of personnel, (iv) personal protective equipment compliance, and (v) frequency of accidents.

RESULTS

Independent variable: Clients' use of health and safety criteria at tender stage

The responses are illustrated in Figure 1. The available score range was 0, indicating no use of health and safety criteria when assessing tenders, to 20 representing excellent use of health and safety criteria when assessing tenders. The mean score from respondents was 12.60. Expressed as a percentage this mean score was 63%. Given the five wide response band of never, rarely, sometimes, often or always, this result leads to a finding that clients 'often' make use of health and safety criteria when assessing tenders.

Figure 1: Clients' use of health and safety criteria at tender stage



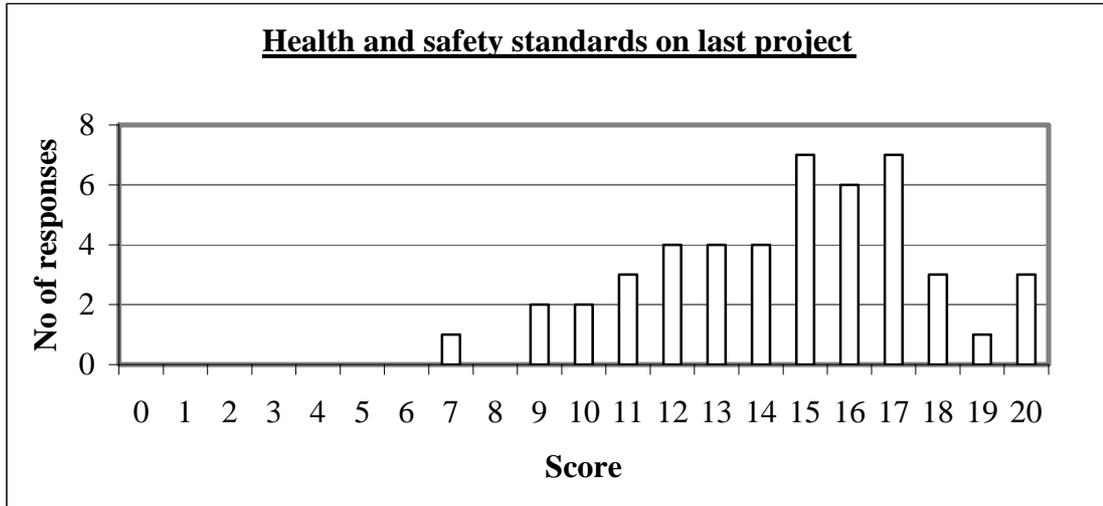
Dependent variable: the standard of health and safety during the construction phase

Figure 2 shows the distribution of the scores. The available score range was 0, indicating very poor standards of health and safety on clients' last construction projects, to 20 representing excellent standards. The mean score was 14.60. The mean score expressed as a percentage is 73% suggesting very good standards of health and safety.

Internal reliability

The questions posed in the postal questionnaire have been tested for reliability using Spearman's paired Rho correlation calculation. The variables are paired, since each respondent has two 'scores'; the individual question score and the total summated score. The scores of individual questions have been correlated against the total summated score for each variable, as recommended by Openheim (1996: 195-200). The correlation coefficients for the five questions used to measure the independent variable ranged from 0.55 to 0.79. Similarly, the coefficients for the five questions used to measure the dependent variable ranged from 0.41 to 0.84. All were significant at $p = 0.01$. The scale is considered as being internally reliable.

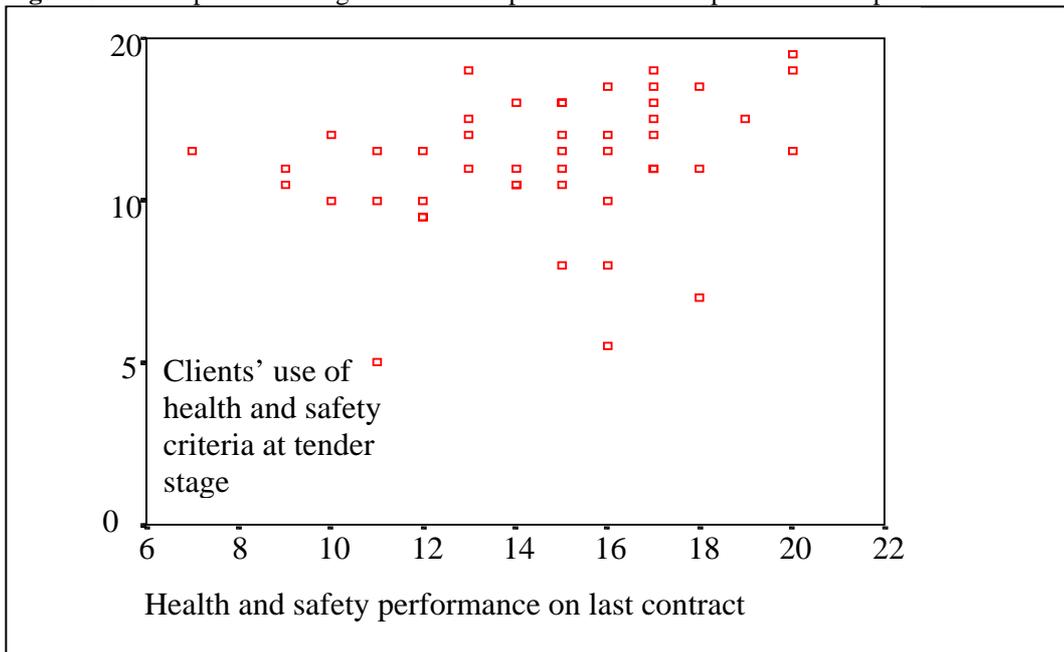
Figure 2: Health and safety standards on last project



Main research hypothesis

The research hypothesis was tested using Spearman’s rank Rho correlation. The paired variables are the scores from each respondent for clients’ use of health and safety criteria at tender stage and health and safety standards on last project. The scatter plot is illustrated in figure 3.

Figure 3: scatter plot indicating the relationship between the independent and dependent variables



It shows positive correlation between the variables. ‘Spearman’s Rho’ correlation coefficient is +0.36, with a significance level of 0.012. The null hypothesis is rejected. The research finds that there is a modest relationship between clients’ perception of the importance of health and safety and the standard of health and safety during the construction phase.

Subject variables

Checks of data homogeneity were undertaken to ensure that the relationship between the independent and dependent variables indicated above was not spurious. The two key subject variables (Bryman and Cramer 1997) considered were (i) market sector in which clients operate, either public or private, and (ii) the experience of clients, categorized by whether they have complete more than ten projects in the last two years. The Mann-Whitney test was used to check homogeneity. In all tests the significance levels were above 0.05. It is found that the subject variables have not influenced the main data set.

DISCUSSION

The relationship between the variables supports Perry's assertion that 'if a client has a cavalier attitude to health and safety, then it is likely that everyone on the project will develop a similar approach' (1999: 20). *Re-thinking Construction* (DETR 1998: 17) identified that people are the most important asset and called for better standards of health and safety for the workforce including more training and better site conditions. It went on to suggest that clients must demonstrate leadership by adopting approaches set out in the report (DETR 1998: 8). Former Construction Minister, Nick Raynsford, recognised that as the country's largest client, government had a duty to set in place a better safety culture (NCE 2001: 6). If clients and their representatives express interest and concern about health and safety matters, then if for no reason other than trying to achieve client satisfaction, contractors will try to ensure high standards. Identifying what represents value to the client is fundamental to the success of the project (CIRIA 1998: 17). When the finding is considered from the clients' perspective two matters become apparent. Firstly it support the essence of regulation 9.3 of the CDM Regulations, assessing the allocation of adequate resources, in that the regulations were written to improve standards of the management of health and safety and the fact that there is a level of association between the variables suggests that this regulation does improve standards. Secondly the finding portrays a negative view of contractors' approach to health and safety. It could be suggested from the results that if clients were not concerned about health and safety then neither would be the contractor. In an industry that suffered 106 fatalities between April 2000 and March 2001 (HSE 2001) this is a poor state of affairs. It should not really be construction clients who lead contractors to change the way in which they do business. However, it appears that many do need to be led or even pushed. Contractors have a legal and moral duty to ensure the health safety and welfare of their employees. 'Re-thinking Construction' identified woefully poor conditions on construction sites and inadequate investment in training at all levels within the industry (DETR 1998: 28-29). Contractors must improve standards and reduce the rate of accidents within the construction industry. By selecting contractors that give a high priority to health and safety clients will contribute to enhancing a better safety culture in construction and will also reduce the risks to the project of delays and costs associated with accidents. It has been suggested that contractors should take responsibility for ensuring that they comply with the law. Unfortunately not all contractors are aware or concerned about their statutory duties. There are low barriers to entry into the construction industry and there is no statutory or professional registration required for general contracting companies. Latham (DETR 1994) suggested the establishment of a single national register for all companies and consultants operating in the market. This has manifested in the 'Constructionline' registration scheme that has been adopted by many local authority clients. However, 'Constructionline' has not been without its critics. A survey of

members of the Association of Consulting Engineers found that registration to the scheme did not give them any benefit (Contract Journal 2001). Rethinking Construction called for major clients to take the lead in driving performance improvements in construction (DETR 1998: 13). Construction clients can make a significant difference in the safety performance of the whole industry by ensuring that they appoint contractors who have included the necessary resources in their price and have the appropriate skills to carry out the project successfully. If clients and their representatives express an interest in health and safety matters, then if for no other reason than trying to achieve customer satisfaction, contractors will try to ensure higher standards. Identifying what represents value to the client is fundamental to the success of the project (CIRIA 1998: 17). In April 2002 the Strategic Forum for Construction published the 'Rethinking Construction Accelerating Change' consultation paper. This paper suggested that clients should deliver excellence in health and safety performance by putting it at the forefront of their agenda when commissioning construction (Strategic Forum for Construction 2002: 13). The recommendations of this report are to be validated by the performance of the 334 demonstration projects that have been carried out using the principles outlined in 'Rethinking Construction'. The mean accident incident rate on these projects was 620 / 100,000 compared with an industry average of 1088 / 100,000 (Strategic Forum for Construction 2002: 25).

CONCLUSIONS

It is concluded that clients' should consider paying more attention to health and safety at tender stage, as there are direct benefits in improvements in standards of health and safety during the construction phase, which should lead to less accidents and reduce risks to the project. Standards of health and safety in the construction industry could be improved by educating clients in health and safety management. If clients' awareness were raised they would then appreciate their role in contributing to higher standards throughout the construction industry.

The broader issue of educating clients has been raised in 'Accelerating Change'. The Strategic Forum suggested that clients should have access to simple guidance on practical steps that should be taken when executing a construction project (Strategic Forum for Construction 2002: 14).

Clients may not be convinced of the commercial arguments to establish health and safety as a lead criterion in the selection of contractors. Therefore, there is a need to educate construction clients in matters of health and safety management and broader issues of construction procurement. The CDM Regulations currently require designers to inform clients of their health and safety duties under the regulations. As a means to convincing contractors of the commercial arguments to adopt health and safety best practice, further study should be undertaken to establish the relationship between contractors' safety performance and their overall project performance.

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