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An evaluation of health and safety management in small construction enterprises in the United Kingdom

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Abstract

The United Kingdom (UK) construction industry has one of the best safety records within the European Union, with fatalities and serious injuries being about one third of the European average. However, despite a number of recent initiatives, accidents still regularly occur on UK construction sites. A disproportionate number of fatalities occur in small construction enterprises employing fifteen operatives or less. In 2007, a survey of small construction enterprises in Southern England was carried out to identify factors which contribute to this relatively poor safety record. The survey was based on prior research which had identified three interrelated factors that influence health and safety (H&S) management: the individual's competence and attitude; the job tasks and environment; and the organisational culture and leadership. It was found that project managers on small construction sites had limited knowledge of H&S requirements which often resulted in a poor or potentially dangerous work environment and a poor safety attitude within the workforce. It was concluded that increased awareness and training of project managers in small construction enterprises should be a priority for all who seek to improve H&S on construction sites.

Key words

England, health, safety, small construction enterprises

Introduction

The UK construction industry is characterised by a small number of large construction enterprises. Many of these enterprises are effectively management contractors, sub-contracting the actual work to smaller sub-contractors. There are also a large number of small enterprises offering specialist or trade services or alternately acting as main contractors on small projects. Figure 1 below demonstrates the size and employment profile within the UK (DBERR, 2007).

There has been continued concern over the number of accidents in the construction industry. In response to these concerns, a Construction Health and Safety summit, which was held in 2001, set ambitious targets for reduction in fatalities and injuries (HSE, 2002). Although the targets are not yet being achieved, there has been a continued reduction in accidents statistics as shown in Figure 2 below (HSE, 2007a). Within the European Union (EU), the UK has one of the lowest rates of construction

injuries. In 2003 the EU/UK rates per 100,000 workers were 10.6/3.6 for fatalities and 6502/1980 for injuries resulting in over three days off work, making UK construction about three times safer than the EU average (HSE, 2004a).

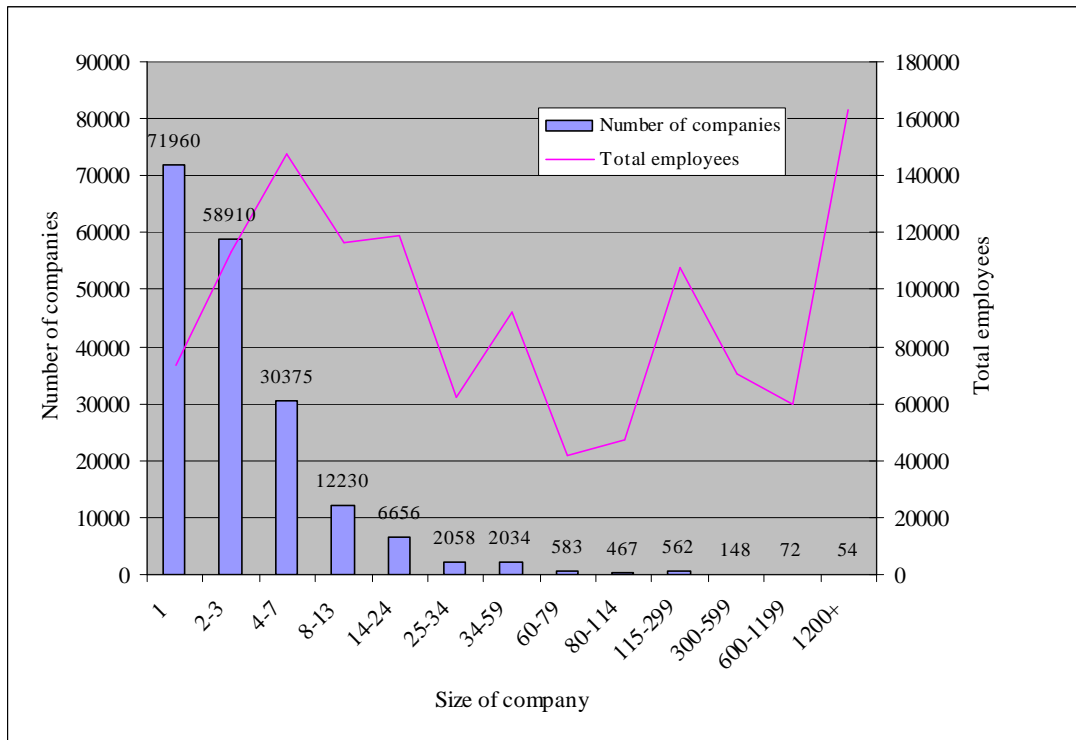


Figure 1 Profile of company size and number employed within the UK construction industry (DBERR, 2007)

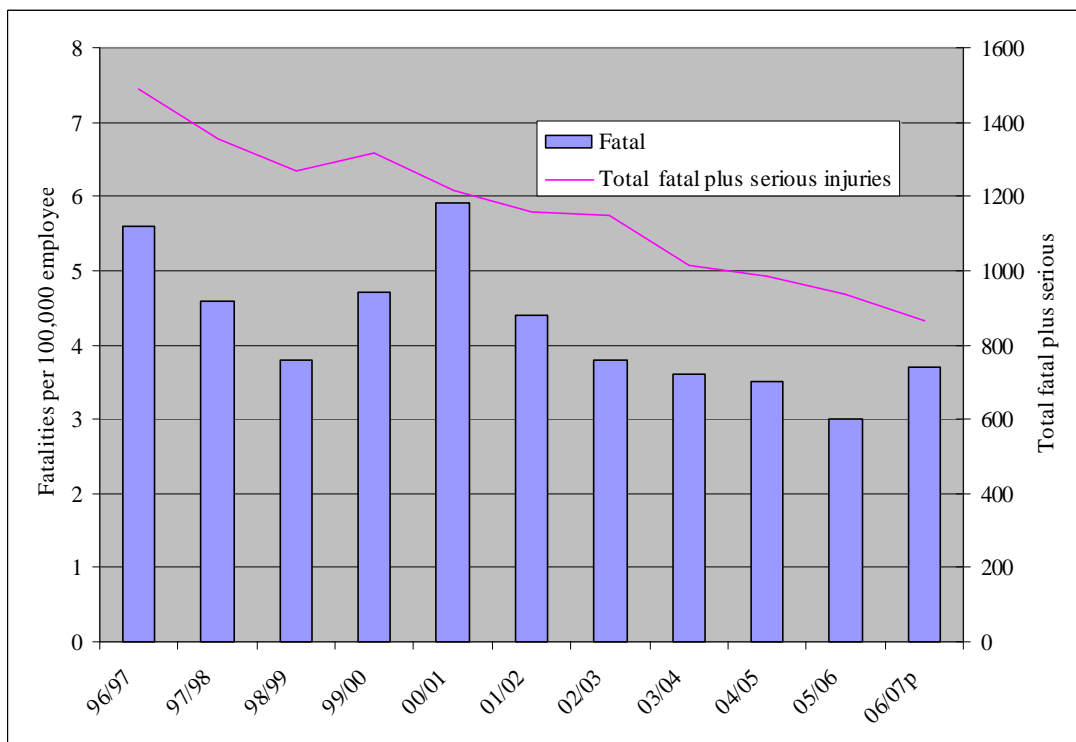


Figure 2 UK construction accident statistics (HSE, 2007a)

Under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR 95), all enterprises have to report incidents which result in fatalities, major injuries and injuries which result in more than three days off work. However, HSE (2002) have expressed concern about the completeness of injury reporting from self employed persons. Although the trend in these figures is encouraging, there is clearly no room for complacency. Construction remains one of the most dangerous of the UK business sectors, with the rate of fatal injuries in construction averaging 4.8 times the all industry average (HSE, 2007b).

HSC (2007) estimated that enterprises with less than 15 employees face a disproportionately higher risk of injury and ill health than those who work for larger employers, as demonstrated in Table 1 below.

Table 1 Accident ratios for small construction enterprises

Proportion of enterprises employing	Construction work by value	Workforce	Fatalities	Injuries	Ill health
> 15	17%	26%	67%	57%	61%
< 15	83%	74%	33%	43%	39%

For all industries, HSE (2007a) has suggested that motivating small and medium enterprises (SMEs) to improve their standards is undoubtedly the single greatest challenge facing HSE in relation to construction and, indeed, others who seek improvements in industry practices.

2 Research problem

The problems with small construction enterprises are not restricted to the UK. Wojcik (2003) reported that in Kentucky, as nationally in the US, small construction enterprises (≤ 10 employees) far outnumber larger contractors. These enterprises are too small, too dispersed and too numerous for effective regulatory oversight from state or federal agencies charged with protecting workers from illness and injury. In addition, small construction enterprises rarely have formal employee safety programs.

Lin and Mills (2001) measured occupational health and safety (OHS) in 44 construction enterprises by questionnaire and concluded that company size had a significant influence on a company's OHS performance and that overall performance decreases with reducing company size. Through an interview survey on a similar number of sites, Monk (1994) arrived at very similar conclusions. All statistical and literature analysis therefore leads to the conclusion that H&S management in small construction enterprises is poor compared to larger enterprises and that there is much scope for improvement.

None of the research mentioned above separated small contractors who operated as sub contractors to larger enterprises from those who operated as main contractors on their own small projects. The objective of the research reported in this paper was to

investigate attitude to H&S implementation between large and small main contracting enterprises.

3 Methods and results

Following guidance from Oppenheim (1992) a questionnaire was designed to capture awareness of, attitudes towards, and practice of H&S. Likert scales were designed as the measurement scale. Questions were kept as simple as possible to encourage responses from managers who may be lacking a high level of formal education.

Between June and August 2007, a total of 30 sites were visited along the central south coast of England, including 24 small sites and 6 large sites. These sites were chosen to meet the criterion: the contractors must be main contractors. The site managers who have overall responsibility for H&S were approached. After explaining the purpose of the study and giving assurances for anonymity, the site managers were requested to complete the questionnaire. The questionnaires were completed in the presence of the researcher who would answer any clarification questions that respondents might have.

Analysis of direct reports

1. The first question required respondents to describe their knowledge to describe their knowledge of the four most common H&S laws. All site managers from the large construction enterprises described their knowledge of each law as very good. The site managers from the small construction enterprises responded as follows: 12%, very good; 42%, good; 29%, medium; 17%, poor; and 0%, none. As can be seen, almost half (46%) of the site managers from the small construction enterprises had limited knowledge of the most common laws and would therefore be unable to enforce their requirements.
2. Site managers were then asked how much H&S training they had received. All site managers from the large construction enterprises responded that they had received a large amount of training. The site managers from the small construction enterprises responded as follows: 12%, large amount; 21%, a lot; 58%, some; 8%, a little; and 0% none. This suggests that only one third of the site managers from the small construction enterprises had received adequate training, which may account for their lack of knowledge on the safety laws.
3. Site managers were asked about the willingness to undertake further H&S training. All site managers from the large construction enterprises indicated that they would definitely consider undertaking the training. The site managers from the small construction enterprises responded as follows: 0%, definitely; 50%, likely; 42%, possibly; 8%, unlikely; and 0%, never. Although no site manager from the small construction enterprises would definitely undertake training, the results suggest that most might consider it. However, the results may have been influenced by the respondent's lack of knowledge exposed in the earlier questions.

4. Site managers were asked if they normally completed jobs on time. All respondents from the large construction enterprises indicated that they always completed their work on time. The site managers from the small construction enterprises responded as follows: 12%, always; 71%, often; 17%, sometimes; and 0%, never. Completion of project on time tends to be a priority on large sites and, provided the site is properly managed, this should not present safety problems. Work on small sites tends to be less likely to be completed on time - this increases pressure, especially towards the end of the project, on the workforce to finish work quickly, which may then increase the risk of accidents.
5. Following on from the above, site managers were asked if they agreed with the statement that 'the workforce were always given adequate time to complete the work'. All site managers from the large construction enterprises strongly agreed with the statement. The site managers from the small construction enterprises responded as follows: 21% strongly agreed; 58%, agreed; 13% were neutral; 8% disagreed; and 0% disagreed. Just over one fifth of site managers from the small construction enterprises could not confirm that the workforce were always given sufficient time to complete their work. This collates with the previous question and shows that workers on small sites are sometimes under time pressure.
6. Site managers were asked to indicate how aware the workforce was about H&S regulations. Site managers from the large construction enterprises were unanimous in claiming a high degree of awareness - they pointed out the common use of site induction, use of method statements and safety inspections. The site managers from the small construction enterprises responded as follows: 33%, very aware; 38%, quite aware; 29%, neutral; 0%, a little aware; and 0%, unaware. Although site managers from the small construction enterprises claimed workforce awareness of H&S regulations, it can be seen from finding 1 above, that this is not always the case. If the site manager lacks awareness it is also likely that the workforce will also be lacking.
7. All site managers, from large and small sites claimed to identify significant risks on their projects.
8. Site managers were asked about the frequency with which safety systems and procedures were developed for each project. All site managers from the large construction enterprises stated that safety systems and procedures were always developed for each project. The responses from site managers from the small construction enterprises were as follows: 20%, always; 34% often; 25% sometimes; 21%, rarely; and 0%, never. Almost half of the site managers from the small construction enterprises do not generally develop site specific safety plans. These procedures are essential in establishing safe methods of working. Failure to develop and communicate safety procedures may well increase the risk of an accident occurring. This result accords with finding 6, showing that lack of site specific safety systems and procedures is reflected in the poor safety awareness of the workforce. Furthermore, with reference to finding 7, it is fair to assume that site managers from the large construction

enterprises will use a systematic system to identify risks, take appropriate actions and communicate them to the workforce. Site managers from the small construction enterprises, acting as sub contractors, will rely on and follow the main contractor risk assessments. Site managers from the small construction enterprises, where the company is the main contractor, are more likely to rely on their own experience due to lack of knowledge and training.

9. The next question continued the theme of site organisation by asking if the equipment/tools used were suitable for the task being undertaken. This question could be seen as questioning the planning ability of site managers and hence a degree of bias was to be expected. Site managers from the large construction enterprises were unanimous in confirming the suitability of equipment. The responses from site managers from the small construction enterprises were as follows: 42%, definitely; 58% probably; 0% neutral; 0%, unlikely; and 0%, never. Although it reflects badly on their management skills, over half of site managers from the small construction enterprises admitted that the workforce sometimes used inappropriate equipment for their task, which would increase the risk of an accident. This continues the theme from finding 8 that there is often a lack of proper planning on small construction sites.
10. Continuing the equipment theme, site managers were asked if they actively took steps to reduce workforce manual handling. Again, site managers from the large construction enterprises were unanimous in confirming the provision of suitable equipment. The responses from site managers from the small construction enterprises were as follows: 59%, always; 33% often; 8% sometimes; 0%, rarely; and 0%, never. Over 40% of site managers from the small construction enterprises admitted to not always taking appropriate steps to reduce the possibility of injuries from manual handling. This may be due to lack of knowledge about legal responsibilities, poor site panning or the financial cost of hiring suitable lifting equipment.
11. Site managers were asked if they involved the workforce in drawing up site method statements and safety rules. This was found to be common practice on all large sites. For small sites, the response was similar to previous questions: 54%, always; 25%, often, 21%, sometimes; 0%, rarely; and 0%, never. Almost half of the small construction enterprises do not always involve the workforce in planning how the work should be done. In the small site sample, most of the site managers were also part of the workforce. It would be expected to be common practice for the site manager to discuss methods with colleagues, so this result is particularly disappointing. In common with finding 8, one cannot avoid the suspicion that some small site managers may not even know what a method statement is and therefore cannot confirm that they are developed them with or without involvement of the workforce.
12. Site managers were asked as to how often they monitored the workforce to ensure procedures were adhered to. All site managers from the large construction enterprises confirmed that they always monitor the workforce. The responses from site managers from the small construction enterprises

were as follows: 29%, always; 58% often; 13% sometimes; 0%, rarely; and 0%, never. As most of the site managers from the small construction enterprises were part of the workforce, the result that only 29% always monitor the safe behaviour of the workforce is surprising. This, perhaps, shows ignorance of basic management responsibilities.

13. Site managers were asked to identify who is responsible for H&S on their site. The question was purposely left open, with no suggestions given, so a range of responses were received. 30% of the site managers from the large construction enterprises suggested that the site manager/site agent/foreman (30%) – 17% suggested the H&S officer while 53% suggested that everyone was responsible. 8% of site managers from the small construction enterprises suggested that the main contractor was responsible and 92% suggested that the site manager/site agent/foreman was responsible. Over half of large contractors expected everyone on site to be responsible for H&S, each individual having responsibility for themselves and others. Only 30% of large contractors identified the site manager and 17% identified the H&S Officer individually, confirming whole group responsibility. 8% of small contractors were working as sub contractors to large contractors and they were unanimous in placing responsibility with the main contractor. The remaining small contractors all identified the site manager or equivalent. Small contractors are unlikely to have designated H&S Officers. No small contractor suggested that everyone on site has safety responsibilities, confirming their belief that safety enforcement is purely a management role.
14. The final question required site managers to indicate what other responsibilities the person responsible for H&S had. Among large contractors, the person responsible for H&S also had the following roles (34%, general/project management; 11%, site management; 21%, no other responsibilities; and 34%, not applicable). Among the small contractors the corresponding values were: 25%, 61%, 8% and 6% respectively. The responses from site managers from the large construction enterprises indicate that safety is seen as a senior management role and also a general workforce responsibility. The responses from site managers from the small construction enterprises confirm their belief that the site manager is solely responsible.

Researcher assessment of site safety

At each site visited, the researcher performed an inspection of the site and completed an assessment form. The assessment form included standard safety criteria: maintaining safe and suitable access and egress, providing sufficient working space, ablution facilities, safety signs, and protection/separation for the general public. The purpose of this assessment was to gain information on the safety aspects of the site so that questionnaire responses could be compared to reality. Site safety was checked by noting if the workforce were wearing hard hats, fluorescent jackets and steel capped footwear. Also, if work was occurring two or more metres high from the ground then the assessment form required that there be suitable and sufficient toe boards, guard rails, barriers, working platforms, adequate ladders, handrails, scaffolding support, lighting and ventilation.

All the six large enterprises fulfilled all of the site safety criteria. However, the small enterprises revealed some very different results:

- 20% of the sites visited did not provide suitable access and egress with rubble and materials blocking the entrance.
- 20% of the sites posed a danger to the public because of debris lying around the site and the site not being properly cordoned off.
- Almost a third (32%) of sites visited did not provide suitable working space. The risk of injury is greatly increased when the working space is confined by tools and rubble around the workers feet, making it much easier to slip or fall in these conditions.
- An alarming 37% of all the small sites visited did not have any safety signs visible around the site which is very worrying as these signs inform people of the dangers on the site and the protective clothing that must be used etc.
- Only 55% of the small sites had ablution facilities, the ones that did not have facilities may have been able to use the resident's home toilet instead. With regard to staff wearing the correct safety gear, it was found that one in four of employees did not wear the complete personal safety equipment, whether it was hard hats, fluorescent jackets or steel capped footwear.
- For work that was happening 2 or more metres above ground it was noted that 10% of toe-boards were not secured properly, 15% of the guard rails were not sufficiently bolted and 12% of the barriers were not fastened adequately. Furthermore, the adequacy of ladder fastenings was poor with 38% of the ladders seen not fastened to the scaffolding. As falling from heights is one of the biggest killers, one would have thought more effort would have been put into ensuring everything was done to prevent any further accidents happening, but this is clearly not the case. Furthermore 8% of the handrails were not sufficiently fastened, which could be extremely dangerous as a worker could rest against the rail thinking it would be safe. Scaffolding support is clearly an integral part of the safety of the workforce as they will be climbing and working on it, thus it was concerning to see that 17% of the small construction sites visited did not have adequate scaffolding support.

The assessment showed that safety management of small sites could often be greatly improved.

4 Conclusions

From the work done in this study, the authors can draw the following conclusions.

- The UK construction industry is a major employer and contributor to the country's wealth. It is characterised by a small number of large enterprises and a much larger number of small enterprises.
- The H&S performance of the UK construction industry is one of the best in Europe with a clear trend of constant improvement. However, it is still one of the most dangerous UK industries. Small construction enterprises have a disproportionately high accident ratio when compared to larger construction enterprises.
- Large enterprises tend to have dedicated personnel to ensure safe working practices on site and these supported effectively by the site management team. Managers of small construction enterprises have much less knowledge of safety law and regulation but many of these managers do not see the need to

improve their understanding. There is a clear difference in management attitude towards safety between large and small enterprises.

- Sites run by small construction enterprises are often characterised by a poor working environment, untidiness (which increase the risk of slips or trips), lack of personal protective equipment, insufficient time to do the work, inappropriate equipment, unsafe manual handling and insecure working from height.
- Construction sites run by small construction enterprises often lack appropriate job resources and have inadequate safety resources. The lack of method statements and specific risk analysis on these sites means that the dangers of certain tasks or work areas cannot be properly communicated to the workforce. Leadership on site safety matters is also lacking due to poor knowledge levels by site management.
- It can be said that much work still needs to be done to improve safety standards of small construction enterprises and that the safety awareness of the site manager should be the target for this improvement.

5 References

- DBERR (2007). Construction Annual Statistics 2007. Department for Business, Enterprise and Regulatory Reform. Norwich: Her Majesty's Stationary Office.
- HSC (2007). Construction Programme's existing SME work and development of future Strategy. Retrieved 10 November 2007 from:
<http://www.hse.gov.uk/aboutus/hsc/meetings/2007/090107/c16.pdf>
- HSE (2002). Health and Safety Performance in the Construction Industry. Health and Safety Executive. Norwich: Her Majesty's Stationary Office.
- HSE (2004a). European Comparisons - Tables. Health and Safety Executive. Norwich: Her Majesty's Stationary Office.
- HSE (2007a). RIDDOR rates of reported fatal injury to workers, non fatal injury to employees. Retrieved 29 November 2007 from
<http://www.hse.gov.uk/statistics/industry/construction-ld1.htm>
- HSE (2007b). Statistics of Fatal Injuries 2006/07. Health and Safety Executive. Norwich: Her Majesty's Stationary Office.
- HSL (2002). Safety Culture: A review of the literature, HSL/2002/25. Sheffield: Health & Safety Laboratory.
- Lin, J. and A. Mills (2001). Measuring the occupational health and safety performance of construction companies in Australia. *Facilities*, **19**, 3/4, 131-138.
- Monk, V. (1994). Occupational Health and Safety Management Systems and Safety Performance in the Building and Construction Industry. Melbourne: Worksafe Australia.
- Oppenheim, A. N. (1992). Questionnaire design, interviewing and attitude measurement. London: Continuum.
- Wojcik, S.M., P. S. Kidd, M. B. Parshall and T. W. Struttman (2003). Performance and evaluation of small construction safety training simulations. *Occupational Medicine*, **53**, 279-286.