

## Fatal accident in Korean Construction Industry in Comparisons with the UK Figures

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(Received March 02, 2005; Accepted June 2005)

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**Abstract:** In spite of the rapid economic growth in Korea, safety cultures in construction industry have not much improved during last ten years. When it is compared to other developed countries of safety, accident rate of Korean construction sites shows bleak figures. This study compares the safety figures of Korea with the UK figures in order to find out what is needed for the safety of the construction sites in Korea. By comparing occupations, age groups, kind of accident, and agent, this study found several differences and similarities, and derived the directions for better safety management.

**Key words:** safety management, construction safety, occupational safety

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### 1. Introduction

Job-related accidents contribute to hundreds of deaths and tens of thousands of serious injuries every year. According to the Korean Occupational Safety and Health Agency (KOSHA), up to 612 workers lost their lives and more than 20,000 workers were seriously injured in 2004, which means that about one worker is dying and about 50 workers were being injured at construction sites every day [1]. It is even appalling when these figures are compared to those of other countries. For instance, in respect to job-related death in construction sites, Korean figures of just one year beats the seven-year sum of those of the UK [2]. Considering both countries' size of the economy, this figure tells how serious the issues around safety and health are.

There have been a number of studies which have examined the safety statistics of the construction sites. Williamson [3] analysed whether there were general patterns of causation for fatalities at work throughout the construction industry and, after examining the relationships between sequences of accident causation and type of occupation, found that fatalities occurred in a similar manner for most occupational groups. Larsson [4] compared the severity of injuries according to occupations and type of accident. McCann [5] examined the

fatal injuries that occurred when workers were travelling using personal lifts, and identified both the dominant types of accident and the type of lifts in which the most accidents happened. Whitaker [6] analysed accidents involving temporary access systems, finding that these arose from the failure to control risk, unsafe methods and procedures, and inadequate training and supervision. Halperin [7] evaluated common scaffold safety practices in construction. Soltani [8] studied the reduction of risks on construction sites through, firstly optimising the movement paths of people and vehicles on sites and, secondly, by making detailed decisions about travelling distances and operational paths in workplaces. He stated that the incidence of accidental death and injuries could be reduced if the use of vehicles and mobile plant was properly managed. Although these studies provided useful and practical figures and theories, as they are based on the figures of the countries where accident rates are as high as those of Korea, few of them can explain the acute accident figures of Korean construction industry.

In order to find out the clues for that high incident rate of Korean construction industry, this paper provides a comparative study of construction accidents of the Korean construction industry with those of the UK. The problems that will be discussed in this research are: Is it just the number of occurrence that is different or is there any other variations between the two countries; If

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there are any, then do those variations afford any clues for the appalling amount of death, e.g., risk factors that affect the workers' behaviour and work-environment that lead to high-risk situation and affect different patterns of accidents occurring?

**2. Method**

Comparisons were conducted using the fatal accident report published by KOSHA [1] and the statistics published by the Health and Safety Commission (HSE) [2]. As the number of accident occurred in the UK was far less than that in Korea, for the purpose of matching comparison, sum of the periods between 1996/97 and 2002/03 was chosen. Data of the two reports were compiled and matched in respect to the kind of accident, agents to accident, occupational differences, and ages.

**3. Results**

2004 KOSHA statistics show that 612 workers were fatally injured or killed at work, whereas, in the UK, it is just less than 100 workers, annually. The total figure of fatal injuries in the UK between 96/97 and 02/03 periods was just 572, which means more than six times of workers were killed or fatally injured in Korea when it is compared to the UK.

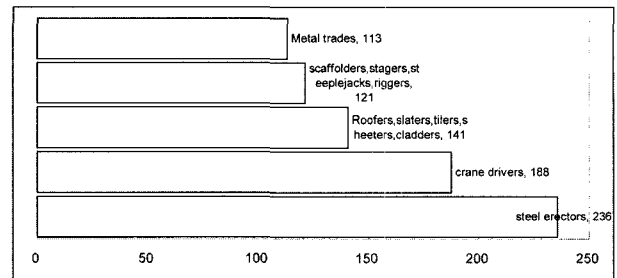
Table 1 shows that "falls from a height" is still the most dominant type of accident both in Korea and in the UK, though a bit more numbers occurred in Korea. One of the differences that can be found in this data is that "collapsing and overturning" is the second dominant type of accident in Korea, yet it is the fifth in the UK.

Table 2 presents the agents that caused falls from a height. More number of falls tends to occur due to structural reasons than those of access reasons, but the ratio is a bit steeper in Korea. In respect to access falls, the ratio of scaffold and others was 1:3 in the UK, whereas it was just the opposite in Korea. The ratio of platform and other structural falls was 1:9 in the UK,

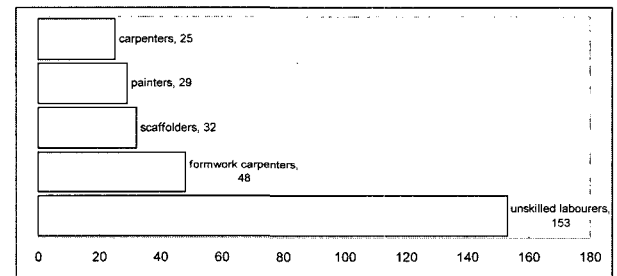
**Table 2.** Fatal injuries to workers due to falls from a height by agent

Type of falls	UK, 96/97-00/01p	KR,2004
Access falls	44.2%	39.9%
Scaffold	33.3% (14.7%)	61.2% (24.5%)
Other access falls	66.7% (29.4%)	38.8% (15.5%)
Structure falls	55.8%	60.1%
Platforms above ground level	10.9% (6.1%)	22.2% (13.3%)
Other structure falls	89.1% (49.7%)	77.8% (46.7%)

( ): ratio to all



**Fig. 1.** Fatal injuries to workers, five most dominant occupation (UK, 96/97-02/03p)



**Fig. 2.** Fatal injuries to workers, five most dominant occupation (Korea, 2004)

yet it was 2:8 in Korea.

In Figure 1 and 2, certain dissimilarities are found between the two countries about the vulnerable occupations for fatal accidents. Firstly, while steel erector was the most vulnerable occupation in the UK, it was unskilled labourers in Korea. Secondly, formwork car-

**Table 1.** Fatal injuries to workers by kind of accident

Kind of accident	UK, 96/97-02/03p		Korea, 2004	
	Count	Rate (%)	Count	Rate (%)
Falls from a height	294	(56.1%)	351	(62.3%)
Struck by moving, including flying/falling object	81	(15.5%)	49	(8.7%)
Struck by a moving vehicle	61	(11.6%)	37	(6.6%)
Contact with electricity or electrical discharge	46	(8.8%)	30	(5.3%)
Trapped by something collapsing/overturning	42	(8%)	96	(17.1%)

( ): rate to total

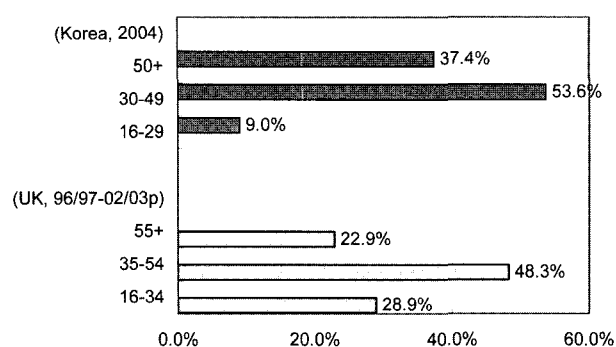


Fig. 3. Fatal injuries to workers by age

penters and painters, though they were not in the five most vulnerable in the UK data, are the second and fourth vulnerable occupations to accident.

As shown in Figure 3, age groups of the injured workers were similar in both countries. Workers between 30 and 50 are dominant in number, but in Korea the number of workers younger than 30 are just one fifth of those over 50's.

#### 4. Discussion

The two types of accident, "falls from a height" and "Collapsing and overturning," which has been the most dominant type of accident in Korea, is such types of accident that can be prevented just by providing proper safety resources and sufficient structural stability. When we examine Table 2, it is apparent that proper safety resources tend not adequately provided in many construction sites in Korea. As Table 2 shows, the fact that the ratio of falls involving scaffolds and platforms occurred was bigger in Korea than that of the UK data indicates that more number of falls occurred in Korea due to inadequate temporary structures such as scaffolds and platforms. Whether it was structural or access problems, considering the fact that scaffolds and platforms are very important safety resources that protect workers from dangers of construction, especially from falls, there still exist unreasonably and poor aspects in safety management of construction sites in Korea.

The fact that unskilled labourers suffer accidents more than others indicates that workers did not get adequate safety training before they were sent to their jobs. More formwork carpenters involved in accident in Korea than in the UK, and one of the possible explanations for this is that many construction works were being performed by in situ concrete method. One of the things that this fact suggests is that adopting prefabrication method can improve site safety rather than using more tedious and

complicated in situ construction. This suggestion is backed up by the dominance of steel erectors and crane drivers in the UK accident statistics, which implies that, in the UK, steel structures and prefabrication methods are more frequently adopted than in Korea, rather than adopting conventional in situ concrete construction. Therefore, in order to reduce accidents in site, it is required to modernise construction methods and convert conventional methods to less labour-oriented and more systemised methods.

Painters involved in accidents while they are performing painting work at outdoor surface of buildings using hanging platform. This is strongly related to the effectiveness of providing adequate safety resources and it means that workers are often doing their jobs on an unstable work platform and safety management failed to properly inspect the safety resources before the job started.

Aging of the workers is a bit worrying in both countries. However, considering that industrialisation is more progressed in the UK than in Korea, the figure indicates that the seriousness of aging workers is more crucial in Korea.

#### 5. Conclusion

Although the history of industrialisation of Korea is sorter than those of the UK, the fact that number of fatal injuries of Korea is more than seven times larger than that of UK tells us that huge amount of endeavour needs to be exerted not only for the safety of workers but for improving the reputation of the construction firms as well.

The results of this study indicate several directions for the improvement of safety in construction. Firstly, safety resources need to be properly provided. For instance, temporary facilities such as scaffolds and work platforms should be more adequately provided in such a way that increases both structural safety and access safety. Secondly, safety-oriented construction methods need to be adopted. Minimising in situ placement of concrete, reducing in situ formwork, and increasing prefabrication are possibly more safety-oriented than in situ placement and labour-oriented methods. Thirdly, it is required to do safety training for the new workers, especially for unskilled labourers. Finally, as aging of the workers can adversely affect the site safety, construction firms need to prepare measures to cope with the gradual reduction of workforce, for instance, developing less labour-oriented construction methods.

### Acknowledgement

This work was supported by the Post-Doctoral Fellowship Program of the Korea Science & Engineering Foundation (KOSEF).

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