Journal of Safety Research 41 (2010) 433–443

Contents lists available at ScienceDirect

Journal of Safety Research

journal homepage: www.elsevier.com/locate/jsr

An empirical survey of the benefits of implementing pay for safety scheme (PFSS) in the Hong Kong construction industry

Daniel W.M. Chan, Albert P.C. Chan, Tracy N.Y. Choi *

Department of Building and Real Estate, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China

ARTICLE INFO

Available online 16 September 2010

Keywords:
Pay for Safety Scheme (PFSS)
Safety performance
Benefits
Hong Kong
Construction industry

ABSTRACT

Introduction: The Government of the Hong Kong Special Administrative Region (SAR) has implemented different safety initiatives to improve the safety performance of the construction industry over the past decades. The Pay for Safety Scheme (PFSS), which is one of the effective safety measures launched by the government in 1996, has been widely adopted in the public works contracts. Both the accident rate and fatality rate of public sector projects have decreased noticeably over this period. *Method:* This paper aims to review the current state of application of PFSS in Hong Kong, and attempts to identify and analyze the perceived benefits of PFSS in construction via an industry-wide empirical questionnaire survey. A total of 145 project participants who have gained abundant handson experience with the PFSS construction projects were requested to complete a survey questionnaire to indicate the relative importance of those benefits identified in relation to PFSS. The perceived benefits were measured and ranked from the perspectives of the client and contractor for crosscomparison. *Results:* The survey findings suggested the most significant benefits derived from adopting PFSS were: (a) Increased safety training; (b) Enhanced safety awareness; (c) Encouragement of developing safety management system; and (d) Improved safety commitment. A wider application of PFSS should be advocated so as to achieve better safety performance within the construction industry. *Impact on Industry:* It is recommended that a similar scheme to the PFSS currently adopted in Hong Kong may be developed for implementation in other regions or countries for international comparisons.

1. Introduction

The construction industry is one of the most hazardous industries due to its unique high-risk nature (Jannadi & Bu-Khamsin, 2002). It is evident that the construction industry has recorded the highest rate of accidents among various industries in most parts of the world (Ahmed, Kwan, Weiming, & Pui Ho, 2000; Choudhry & Fang, 2008; Koehn, Kothari, & Pan, 1995; Sawacha, Naoum, & Fong, 1999; Wong & So, 2004). Site accidents are mainly raised from competitive tendering, extensive use of subcontractors, poor accident record keeping and reporting system, the low priority given to safety, inadequate safety training provided to contractors management and workers, and so forth, as reported by Poon (1998). The unsatisfactory safety record of Hong Kong is still a matter of grave concern to both the government and the general public (Tam & Fung, 1998).

In order to improve the prevailing safety performance of the Hong Kong construction industry, the Hong Kong SAR Government has introduced various safety initiatives to the public works contracts over the past decades and has dedicated tremendous efforts on their implementation. The Pay for Safety Scheme (PFSS) is one of the effective safety incentives launched in the public sector by the government in 1996. The objectives of this paper are to review the current state of application of PFSS in Hong Kong in general, and report on the key findings of an empirical survey on the potential benefits associated with adopting PFSS in particular. The perceived benefits of PFSS by the clients and contractors were identified, measured, and compared. The paper starts with a concise review of the overall safety performance of the construction industry and the current application of PFSS in Hong Kong. Then, the methodology of the research is outlined followed by the presentation and discussion of survey results. Lastly, conclusions are drawn based on the research findings. The research outcomes of this study could provide some useful insights to encourage a wider application of PFSS within the construction industry.

2. Overview of safety performance and application of safety incentive schemes in the construction industry

2.1. Application of safety incentive schemes

It has long been recognized that incentive schemes can improve company performance and motivate the workforce (Leichtling, 1997). Safety incentive scheme is one of the high-impact zero-accident techniques (Hinze & Wilson, 2000). According to Opfer (1998), safety

* Corresponding author. Tel.: +852 2766 4305; fax: +852 2764 5131.
E-mail address: bsnychoi@inet.polyu.edu.hk (T.N.Y. Choi).

0022-4375/$ – see front matter
doi:10.1016/j.jsr.2010.07.001

incentive programs can be considered as a psychological approach in which employees can be rewarded for safe work habits. Both LaBar (1997) and Laws (1996) expressed that safety incentive schemes are generally applied to reduce accidents and improve safety behaviors and safety-related records. Many organizations in the United Kingdom organize safety incentive schemes internally for improving safety performance of workers (Krause, 1998). Typically, some tangible "prizes" (e.g., bonus, prize, gift, coupon) were awarded to individual employees or contractors under safety incentive scheme. Tangible rewards can be powerful motivators of safety performance (Austin, Kessler, Riccobono, & Bailey, 1996).

Geller (1999) supported that the implementation of safety incentives may provide positive outcomes. This is reinforced by two empirical research findings. The research conducted by McAfee and Winn (1989) indicated that "every study without exception, found that incentives enhanced safety and/or reduced accidents in the workplace, at least in the short term." Another study by Simonet and Wilde (1997) opined that safety incentives bring about desirable safety performance. Gambatese (2004) divided safety incentive programs into three types, namely: outcome-based, behavior-based, and activity-based. Under the activity-based approach, employees are rewarded when they participate in the prescribed safety-related activities such as safety toolbox talk and safety training courses. The "Pay for Safety Scheme (PFSS)" launched by the Works Bureau of Hong Kong Government in 1996 can be classified as an activity-based approach.

2.2. Safety performance of the construction industry

The safety performance of the Hong Kong construction industry has demonstrated a remarkable improvement over the past decade (Lam, 2008). The accident rate of the construction industry in Hong Kong has been declining in recent years from 1998 to 2007 (Labour Department, 2008a). It is encouraging to observe that the number of industrial accidents in the construction industry of Hong Kong decreased from 3,400 in 2006 to 3,042 in 2007, down by 10.5%, while the accident rate per 1,000 workers decreased from 64.3 to 60.6, down by 5.8% as compared with the 2006 statistical figures. When compared with 1998, the construction accidents in 2007 fell heftily by 84.5% and the accident rate per 1,000 workers also dropped by 75.6% (Fig. 1). Despite these significant improvements in construction safety performance, the high-risk construction industry still recorded the highest number of fatalities and accident rate among various industry sectors.

In 2007, the number of industrial fatalities in the construction industry was 19, higher than 16 in 2006 by 18.8%, but lower than 56 in 1998 by 66.1% and the average of the past five years (20.4) by 6.9%. The industrial fatality rate of the construction industry in 2007 was 0.379, higher than 0.303 in 2006 by 25.1% and the average of the past five years (0.352) by 7.5%, but lower than 0.709 in 1998 by 46.6% (Fig. 2).

The Hong Kong SAR Government has introduced a plethora of different safety initiatives in both the public and private sectors over the past decades for improving the safety record of the Hong Kong construction industry. In 1996, the Works Bureau developed a couple of major safety schemes (i.e., the Pay for Safety Scheme [PFSS] and the Independent Safety Audit Scheme) to facilitate the implementation of efficient safety management systems and to uplift the standard of safety performance (Hong Kong Government, 1996).

2.3. Development of PFSS in the public sector

PFSS is one of the public sector initiatives launched by the Works Bureau toward the government capital projects in 1996. It primarily aims to encourage safety awareness by taking the contractor's pricing for site safety items out from the realm of competitive bidding (ETWB, 2000; REDA/HKCA, 2005a). Lau (2005) added that PFSS was designed to encourage establishment of the Safety Management System in government construction contracts. As the contractors may try to bid contracts at the lowest price, it causes the sum payable for the safety-related items not to be measured and identified in the tender rates and prices. Therefore, contractors are likely to cut the budgets under the safety items to put in other necessary items (ETWB, 2000). PFSS was launched to remove concerns on safety consideration from the realm of competitive bidding (Fung, 2007), enabling any sums payable for carrying out safety measures to be identified in the construction contract.

A similar PFSS was later launched by the Hong Kong Housing Authority (HKHA) in 2000 to set aside a contract sum within the contract provision to encourage contractors to achieve good safety performance. The HKHA also required all the public housing projects to be undertaken under PFSS. There were more than 800 public works projects that implemented PFSS between 1996 and 2003 (Ng, 2007). Hands-on experience derived from the public sector in implementing PFSS has proved effective in improving the overall safety performance of contractors working for government works contracts and HKHA's construction and maintenance projects. It is indicated

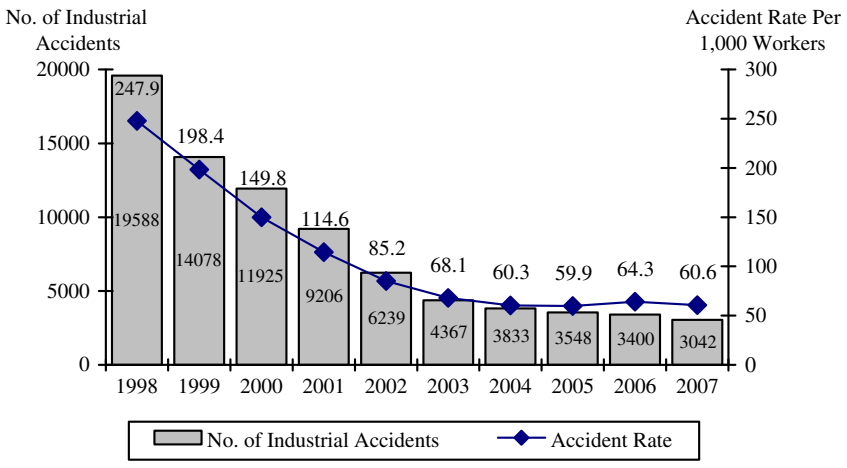

Fig. 1. Number of industrial accidents and accident rate per 1,000 workers in the construction industry from 1998 to 2007 (Source: Occupational Safety and Health Branch, Labour Department, 2008).