ABSTRACT

Traditionally site safety is a concern for the Architectural, Engineering & Construction (AEC) industry. In view of government of Hong Kong initiating a number of large scale AEC projects and a relative high number of serious accidents continue to occur, site safety will remain an issue for the local AEC. Recently, Building Information Modeling (BIM) or digital simulation and data management software have been attracting much attention both in Hong Kong and in the international sector. It is a notable question to ask “Is it possible to use BIM to improve site safety in Hong Kong?” For over ten years now, the concept of Safety Management System (SMS) has been adopted in Hong Kong as the strategy for site safety management systems. It is commonly accepted in Hong Kong the drive to establish, implement and monitor SMS comes from registered safety officer (RSO) and registered safety auditor (RSA). Thus, in theory views of safety auditors on the use of BIM for safety can reflect whether or not BIM is effective tool to improve site safety. In this paper, the SMS regulation in Hong Kong will be briefly outlined and then results of a survey of members of the Society of Accredited Safety Auditor (SASA) in Hong Kong will be presented. It is concluded that 78% of the respondents to this study believe there is benefit for using BIM for SMS and commonly respondents refer to using BIM for visualization of construction sequences and planning of hazard controls. This study provides the background to a wider investigation of the linkage between BIM and Health and Safety Management.

Keywords: Architectural Engineering & Construction (AEC), Building Information Model (BIM), Hong Kong, Safety Management System (SMS), Sustainable Development (SD)
1. BACKGROUND

To achieve Sustainable Development (SD), one should target and include AEC as it consumes up to 40% of energy consumption. Improving safety for AEC is a benefit for the working population and society in general, contributing to SD. In terms of overall gross domestic product and employment size, the AEC remains an important sector in Hong Kong but it is also responsible for relatively high number of serious accidents (International Labour Organization, 2011; Labour Department, 2010).

Suermann (2009) reports out of six Key Performance Indicators, Safety was ranked 4th following Quality, On-time and Cost where safety refers to site or worker safety. Over years, different stakeholders including government, profession groups, worker unions and safety practicing groups have used different tools to address the issues.

Outlines of safety milestones in Hong Kong are:

1. Enactment of the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulation in 1986 where each 100 workers on site will be required to hire a RSO;
2. A Work Bureau’s Technical Circular in 1994 requires “any contractor with six or more convictions on a single contract within a rolling six month period may be suspended from tendering for government projects. Also in 1994, the Housing Authority of the Hong Kong Government includes safety as one of the performance yardsticks of public housing projects in their Performance Assessment Scoring System (PASS) where poorly scored contractors in PASS will be suspended for tendering for certain period of time;
3. In 1998, the mandatory Green Card training requires site workers, staff and even management staff to go through the mandatory training.

In addition to specific safety legislation and the above initiative, many governments including Hong Kong now have adopted the concept of self-regulation where companies systematically establish, implement and monitor a system to handle occupational safety concerns.

2. ADOPTION OF SMS FOR HONG KONG

In the past, it is not clear what elements should be part of a company’s safety management system.

Tam et al (2004) considers following are the most important three factors affecting site safety in China:

1. Poor safety awareness of firm’s top leaders;
2. Lack of training; and
3. Poor safety awareness of project managers.

Mohamed (1999) studies the relationship between Safety Management Index (SMI) and overall safety performance in Australia where SMI consists of Safety Policy, Mission Statement on Safety, Safety Meeting’s frequency, Regularity of Safety Audit, Level of Induction Training, On-going Safety Awareness Program.

To explore how best to integrate SMS into existing management systems, Zutshi and Sohal (2005) discussed the importance of:

- Obtaining commitment from the top management;
- Having resources to integrate the system;
- Having communication and training across the organization; and
- Having integrated audits.

However Teo and Ling (2006) argues there is still no standardized audit tool that can objectively assess the strengthen and weakness of a SMS consistently in Singapore.

From the above and other management models, the Factories and Industrial Undertakings (Safety Management) Regulation in Hong
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