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Investigating the difficulties of implementing safety practices in international construction projects

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ABSTRACT

Globalization facilitated the development of international construction. Construction safety issues have become a global problem. International construction projects lead to complexities and difficulties in safety management given the involvement of participants from different countries and regions. This study takes case of Chinese international contractors to explore and evaluate the difficulties of implementing safety practices in international construction projects. Mixed methods include qualitative (i.e., document analysis and structured interview) and quantitative methods (i.e., Delphi survey) were adopted. The most important difficulties of implementing safety practices in international construction projects identified in this study were labor-only subcontracting and complex labor structure, low safety awareness of local workers, high turnover rates of frontline workers, and the failure of Chinese workers who work far from home to adapt to a boring lifestyle in overseas projects. Eliminating these major difficulties can facilitate the implementation of safety practices in international construction projects and further improve safety performance.

1. Introduction

Globalization brought about technological advancement, rapid transportation, and convenient communication, and facilitated the development of the international construction market. International construction markets have continued to grow parallel to world economic expansion (Zilke and Taylor, 2015). In response to this trend, an increasing number of construction companies have become involved in the international construction market to guarantee survival and seek continuous development (Ye et al., 2009). Among them, international contractors from developed countries (e.g., American, France, and Spain) hold a large market share continuously. Recently, it is noted that the number of international contractors from newly industrialized and developing countries, such as China, Korea, Turkey, and Brazil, has increased in the past decade (Ofori, 2003). According to Engineering News-Record, the number of contractors listed in the top 250 international contractors in China, Korea, Turkey, and Brazil in 2014 were 65, 12, 43, and 3, respectively. These figures account for 49.2% of the total (Reina and Tulacz, 2015). Table 1 shows the market shares of top international contractors by country in 2014. The market share of China was 17.2%, which highlights the important role of Chinese international contractors (CICs) in the global market (Fig. 1).

Due to the existence of industrialization, society prioritizes safety (Mahalingam and Levitt, 2007). Safety management emerged as an important topic in corporate management. High-quality safety performance increases corporate competitiveness, whereas poor safety performance results in a bad corporate reputation thereby leading to competitive disadvantage (Smallman and John, 2001). The construction industry has been regarded as one of the most dangerous industries in the world (Mohamed, 2002). The construction industry employs 7% of the world's workforce but it roughly occupies 30% to 40% of fatal injuries worldwide (Sunindijo and Zou, 2012). The complexity of construction and the temporary nature of projects exposes frontline workers to dangers and accidents; thus, safety is considered to be a complex issue for construction management (Swuste et al., 2012).

Compared with domestic projects, international projects are considered to be riskier (Eybpoosh et al., 2011; Schubert and Dijkstra, 2009). International construction involves participants from various countries and regions, resulting in complex national, organizational, and individual issues that may affect adversely on construction safety management and lead to unsatisfactory safety performance (Schubert and Dijkstra, 2009). Some common obstacles have been identified to

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Table 1
Background of interviewees.

Interviewee	Position	Work experience	Region
A	Project construction manager	5 years	Africa
B	Project HSE manager	6 years	The Middle East
C	Project HSE manager	4 years	Southeast Asia
D	Project HSE manager	20 years	The Middle East
E	Project manager	20 years	The Middle East
F	Project manager	10 years	Africa
G	Project manager	20 years	Southeast Asia
H	Project HSEQ manager	10 years	South Asia

hinder the implementation of safety practices in international construction projects, such as language and communication barriers (Hudson, 2007), cultural differences (Schubert and Dijkstra, 2009), different socio-economic developing levels (Mahalingam and Levitt, 2007), and specific employment situations (Zhang and Fang, 2013; Schubert and Dijkstra, 2009).

Previous studies mainly focus on addressing case-specific and country-specific barriers, which may lack of a comprehensive understanding about the common safety practices in international construction. Also, there is a lack of quantitative research to evaluate and rank the potential obstacles. The current study aims to explore and evaluate the difficulties of implementing safety practices in international construction projects from a global perspective. The research samples have throughout major international construction markets, including Southeast Asia, the Middle East and Africa that conducted by CICs. A comprehensive and deeper understanding of the identified difficulties can help international contractors worldwide achieve continued success in safety management.

2. Literature review

Despite studies on difficulties of implementing safety practices in the construction industry are accessible, the majority of them are based on domestic projects. Only limited studies have been conducted on international construction (Mahalingam and Levitt, 2007; Schubert and Dijkstra, 2009; Hudson, 2007; Kjellén, 2012). International construction projects were deemed to involve participants from various countries with different cultures and values. The implementation of safety practices was considered to involve management of construction safety within a more complicated multi-cultural context (Mahalingam and Levitt, 2007). Given these differences, increased risks were perceived in international projects (Schubert and Dijkstra, 2009).

Some common difficulties have been identified to impede the execution of safety management in international construction projects, including language and communication barriers, cultural differences (Schubert and Dijkstra, 2009), different socio-economic developing levels (Mahalingam and Levitt, 2007; Gao et al., 2017), specific employment situations (Zhang and Fang, 2013; Kjellén, 2012), and contracting philosophy and standards (Kjellén, 2012). First, language and communication barrier is a key obstacle in managing construction safety in international construction (Hudson, 2007). The transfer of information between supervisors and workers or among workers from different countries who speak several languages could be challenging and ineffective. According to Jaselskis et al. (2008), ineffective safety communication resulting from language barriers leads to higher accident rates. Second, people from different cultures have different understandings of health and safety (Mahalingam and Levitt, 2007). This leads to safety management problems. Different cultures and traditions of workers is reflected on human relations and different work habits. The workers are emotionally vulnerable and preoccupied with their own culture and custom (Kartam et al., 2000). Third, different socio-economic developing levels bring about diverse opinions of participants on safety management. Practices considered unsafe by participants from developed countries may be deemed safe enough by participants from developing countries. This contrast and opposition cause conflicts and time losses in rectifying work (Mahalingam and Levitt, 2007). Fourth, specific employment situations cause bad safety practices in international construction. Some workers from backward country are keen to work overtime to earn money in international projects, resulting in stressful and hazardous working conditions without ensuring safety measures (Schubert and Dijkstra, 2009). Meanwhile, the high turnover rate hinders safety management in international construction. Employees whose safety performance were improved during the previous process may be substituted by new members; thus, overall safety performance will inevitably deteriorate without continuous and effective management (Zhang and Fang, 2013). Last but not least, some difficulties are project-based and not limited to international projects. However, their effects on construction safety performance can be amplified if the projects are conducted in an international context. For example, construction safety standards, which stipulate the minimum acceptable safe performance levels, are important factors that affect the

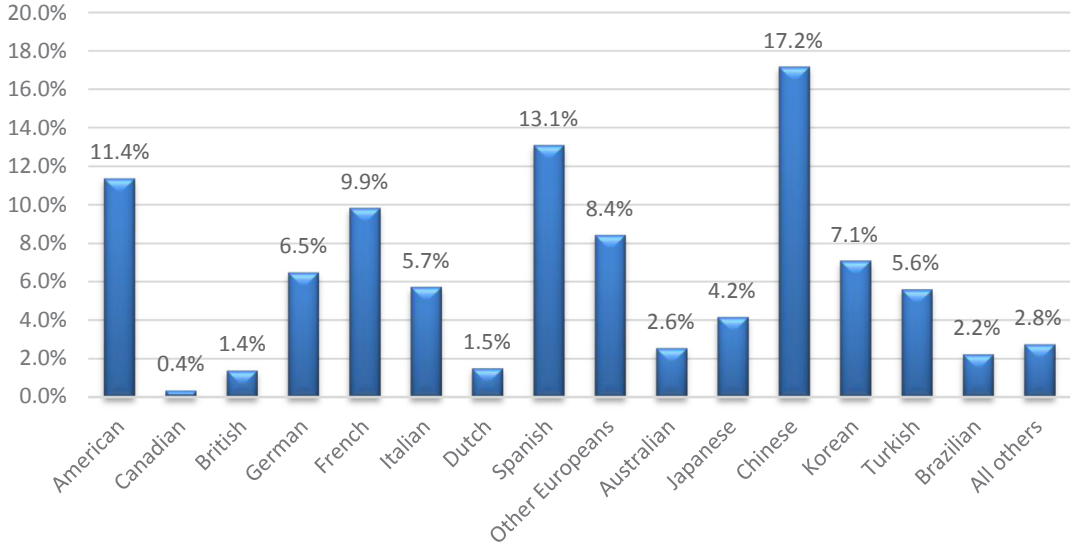

Fig. 1. Market shares of top international contractors by country in 2014 ().
adapted from Reina and Tulacz, 2015