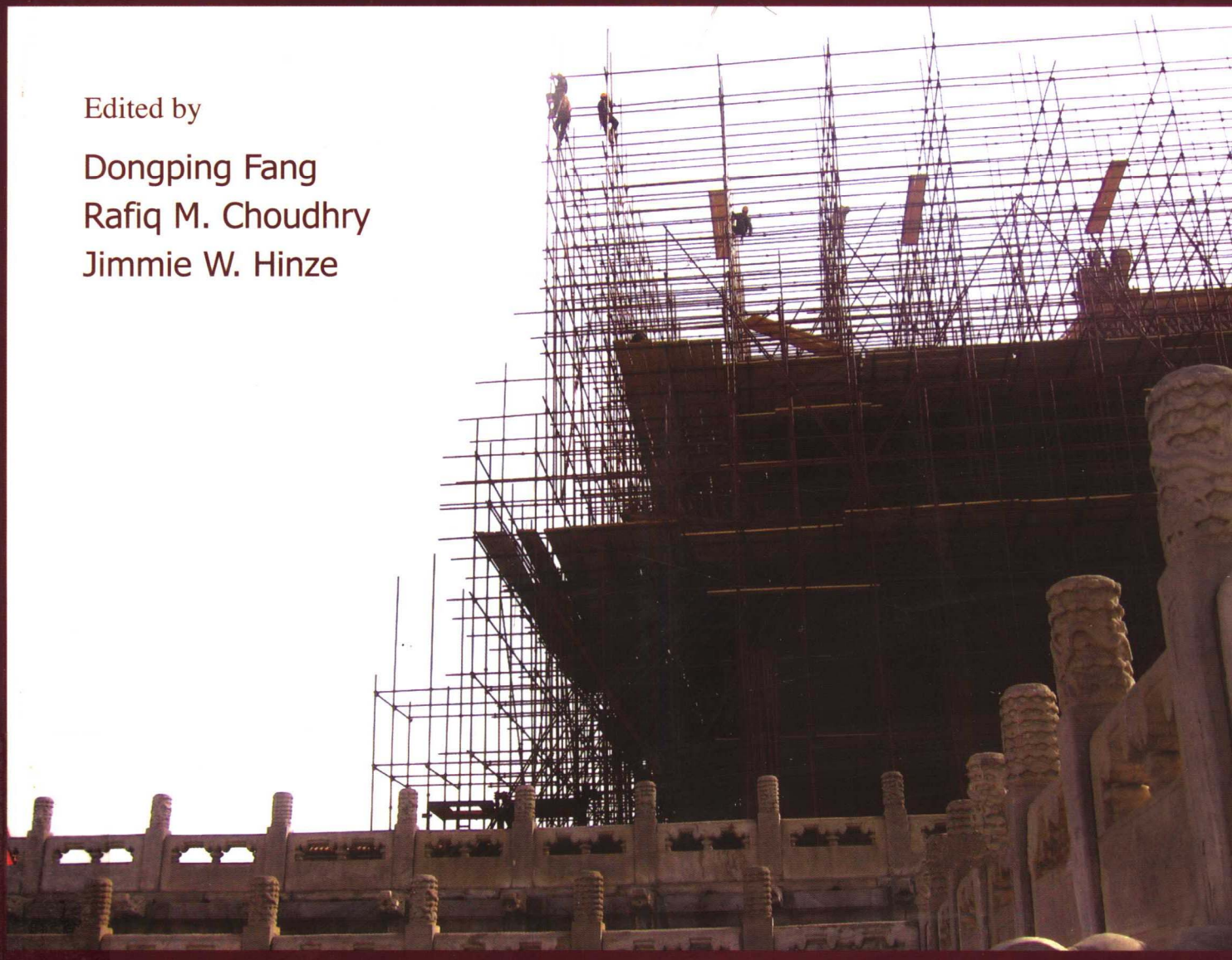
Proceedings of CIB W99 International Conference on

Global Unity for Safety & Health in Construction



Edited by

Dongping Fang
Rafiq M. Choudhry
Jimmie W. Hinze

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内容简介

建筑安全与健康是世界各国建筑业所面临的共同问题，在发展中国家和欠发达国家尤其严重。为了促进世界各国在该领域的交流与合作，由（清华－金门）建筑安全研究中心和 CIB 第 99 工作委员会共同主办的“建筑安全与健康的全球合作”国际会议于 2006 年 6 月 28 日至 30 日在北京清华大学召开。

本书精选了本次会议来自 21 个国家的 75 篇论文，涉及有关建筑安全与健康的法律、战略和发展规划，规范和标准，教育、培训和持续学习，风险分析与决策，安全投资和效益，量测及定量分析，信息技术和自动控制的应用，项目各方角色及作用，发展中国家的相关问题，安全行为和生产力，环境影响评估和噪声控制，工人工作条件和生活质量以及未来发展趋势等内容。

希望本书的出版能够为学术界提供最新的研究思想和资讯，为企业界提供最新的管理理念和方法，为政府提供立法和行政方面的参考。

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PREFACE

The CIB W99 International Conference on Global Unity for Safety and Health in Construction, organized under the patronage of the International Council for Research and Innovation in Building and Construction (CIB) and CIB Working Commission 99 in partnership with (Tsinghua – Gammon) Construction Safety Research Center and the Institute of International Engineering Project Management at Tsinghua University, provides an international forum for researchers, engineers, practitioners, and safety & health professionals to address current issues that affect the successful achievement of safety and health in construction. The primary objective of the conference is to communicate information, expertise, and research results on construction safety and health in order to assist all nations, especially developing and underdeveloped nations around the world, to make improvements in the health and well being of the construction workforce. The conference provides a single forum to bring together researchers, academics, administrators, and practitioners representing educational institutions, government agencies, contracting organizations, consulting firms, and other construction related organizations, officers, experts, and specialists from all over the world.

The conference provides an exchange of experience in new developments and in practical applications to improve safety and health on construction sites. In addressing universal challenges in construction safety & health, the papers presented at the conference have been organized within the following categories:

- Law, strategy and planning
- Standards and guidelines
- Culture and its influence
- Education, training and continuous learning
- Risk analysis and decision-making
- Investments and benefits
- Measurement and quantitative analysis
- Application of IT and automation
- Roles of stakeholders
- Issues in developing countries
- Behavior based safety and productivity
- Environment impact assessment and noise control
- Workers' working conditions and quality of life
- Future development trends

In response to the "call-for-papers", 107 abstracts were received from 26 countries. After abstract review and full paper review, 75 papers from 21 countries were approved by the Scientific and Technical Committee for inclusion in the conference proceedings. Among them, 6 authors, 1 from government, 2 from industry and 3 from academic were selected as speakers to present the highlights of most of the above topics through six keynote addresses. These peer reviewed and edited proceedings are aimed at contributing significantly to the body of knowledge relative to improving construction safety and health in construction.

We would like to express our thanks to the CIB, Tsinghua University, Conference sponsors and supporting organizations, all members of the S&T Committee, as well as the authors, participants and supporting staff members who have contributed to the success of the conference.

Dongping Fang
Rafiq M. Choudhry
Jimmie W. Hinze

Beijing, China
June, 2006

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3 STANDARDS AND GUIDELINES

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1

KEYNOTE ADDRESSES

The Strategy for Construction Safety and Health in China Towards Year 2020

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Abstract: China is now experiencing a rapid booming of its construction industry; however, the safety and health record of the industry is still far from satisfactory-the number of fatalities is as high as 2607 in year 2005 (1193 happened in building and municipal works; others happened in civil and other type of works) and many more injuries and illnesses are even underreported. Therefore, the Ministry of Construction (MOC), responsible for construction safety in China, determined to draft a long term strategy, over a span of fifteen years, i.e. from 2006 to 2020, with the aspiration to improve the safety and health performance of the industry step by step through probing the existing problems and implementing remedial measures including launching of effective programs and actions.

To forge the strategy, the present scenario and the problematic areas are identified and analyzed through literature review, expert consultation and surveys. Problematic areas which are correspondingly the key issues that should be emphasized and gradually improved have been highlighted in the strategy. Before doing so, the best practices including approaches to manage safety and health, in countries with good safety performance (such as UK and US) have been studied. Thereafter, a strategy including 5 key issues and 16 focal points was proposed. The 5 key issues are: *a) Revise, amend and combine the existing scattered legislative provisions (especially the articles on sanctions and penal arrangements) to establish a comprehensive deterrence-based prescriptive legislative framework and control regime; b) Reform the enforcement authority to implement clear, frequent and stringent enforcement campaign and develop and adopt broader accidents reporting arrangement and accident statistics collation and publication system; c) Help construction firms establish and adopt self-regulated safety and health management system and specify the safety responsibility of the owner and designer; Enhance compensation payout for accidents and experiment experience rate adjustment system in Worker's compensation insurance and accelerate the establishment of new safety intermediate organizations and strengthen the contribution of existing ones; d) Inculcate industrial safety and health culture, propel the application of new safety technology in construction industry and pacify the over-competition status of the market; e) Emphasize the importance of occupational health management in construction industry and improve the coordination between MOC and MOH (Ministry of Health).*

Furthermore, several detailed focal points are put forward under each key issue.

Keywords: *construction, health, safety, strategy*

1 INTRODUCTION

1.1 Preface

Construction industry undoubtedly plays a pivotal role in the national economy of China. At the end of year 2003, there are totally 48688 registered firms working in the industry, creating a total output of 2186.5 billion Yuan (about 300 billion US dollar) as well as employing 378 million employees (China Statistical yearbook, 2004). MOC classified these firms into 4 levels according to their working capacities and turnovers. Firms belonging to a certain level can only be awarded with projects of specific contract sum and type. Most workers are peasant laborers from rural area who are originally peasants but move to urban regions and are then employed as construction workers. At the same time, the construction industry is the third on the accident league table. The number of fatalities in 2005 reached as high as 2607 (1193 happened in building and municipal works; others happened in civil and other type of works) (MOC 2006), which is only less than the coal-mining and transportation industry. What's more, underreporting of non-fatal accidents is very common. As to the occupational illnesses, there is not any national data available at all.

The official agency administrating occupational safety in China is SAWS (State Administration of Work Safety) and the official agency administrating occupational health is MOH (Ministry of Health); however, SAWS

does not directly administer safety issues of all industries. Safety in those industries with high risk profile (including mining, marine, construction, etc) is under the control and daily management of the corresponding ministries respectively. SAWS mainly provides instructions and conducts surveillance over the performance of these industries. For example, safety in construction industry is directly administered by MOC (Ministry of Construction) rather than SAWS.

1.2 Focus

The strategy focuses on how safety and health is managed in China. The current arrangements might probably broadly divided into the following five major areas: (a) the legislative framework and control regime for construction safety at national level; (b) the administrative and institutional arrangements by the government for construction safety; (c) safety management at corporate level and project level; (d) occupational health management in construction industry and (e) factors impacting safety management at industry level (including culture factor, technology factor and market factor).

1.3 Methodology

The strategy is made through literature review, expert consultation and surveys. The current status quo of China is mainly identified and analyzed through literature review and surveys. Surveys were conducted in 3 different cities: one is in developed eastern China, one is in middle China, and the other is in undeveloped western China. In every city, 3 different-level construction firms were net in. The target survey population includes government inspectors, top management of construction firms and projects, site safety personnel, foremen and workers.

The historical development and the current safety scenario of developed countries/regions (especially UK, US and European Union) were investigated and analyzed mainly through literature review and experts consultation. 5 experienced experts including academic professionals, senior inspectors and industry professionals are involved.

Consequently, the problems in safety and health management of China's construction industry are analyzed and concluded after a comparison between China and developed countries. The key issues and focal actions are thereafter put forth basing on the experiences of developed countries and the present situation of China.

2 THE PRESENT SCENARIO AND PROBLEMATIC AREAS

2.1 The Legislative Framework and Control Regime for Construction Safety at National Level

The legislative framework on construction safety includes several different pieces of legislations, encompassing laws, regulations, rules and standards. The present legal provisions are mainly detailed, restrictive and prescriptive, specifying the minimum standards that the firms and projects should achieve. The government enforcement agencies send inspectors to enforce the laws.

The 3 major laws related to construction safety are "The Labor Law of The People's Republic of China", "The Construction Law of The People's Republic of China" and "The Law of Working Safety of The People's Republic of China".

Regulations and Rules are the legislative codes made by the State Council and Rules are made by different ministries (such as the Ministry of Construction, the Ministry of Labor and Social Security (MOLSS), etc) under the State Council. The Regulations on the Safety Working Management for Construction Projects is the most important regulation for construction safety.

Standards are mostly prescriptive technical requirements of the construction activities, such as scaffolding safety, prevention of falls, etc. Most standards for construction safety and health in China are compulsory.

Two major problems are identified in the legislative framework for construction safety of China: