CONSTRUCTION ACCIDENTS AND THE LESSON LEARNT FROM 1000 CASES

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Abstract
The safety management of construction projects to prevent accidents requires a thorough understanding of the ‘system mechanics’ of the causation process. Generally, this paper proposes a theoretical model of accident causation for construction projects, representing the underlying and complex interaction of factors in the causation process. The theory describes multiple paths of causation, including the constraints and responses experienced by all project participants, during project conception, design and construction, which may generate situations or provoke behaviours that can lead to increased risk of accidents. It maps causal factors of accidents, including distal and proximal factors, which may be generated by project participants. These factors are identified as contributory factors leading to disturbances of plant or equipment, structures or temporary structures, operatives, materials, services, ground and other facilities. The proximal factors have been validated by analysis of 1000 records of accident investigation provided by UK Health & Safety Executive (HSE). Further study for validating the distal factors is required since current available accident records are incomplete to cover analysis of the distal factors. It will need in depth analysis of problems encountered in pre construction stage of project development. Therefore, in this paper, hypothesised individual distal factors are presented without analysis.

Keywords
accident causation, construction, constraint-response theory, distal factors, proximal factors, project safety management.

INTRODUCTION

Older theories of industrial accident, reviewed by Hale and Hale (1972) and Brown (1990), address only operative behaviour. More recent theories of construction accident causation (Reason, 1990; Whittington, 1992) include management and organisational factors that have influence over the site situation. However, there has been no structured approach to project management or organisational behaviour in accident causation. Current theories address how and why operatives have accidents, but not how and why managerial or professional participants may stimulate unsafe operative actions or site conditions. Accident investigations normally deal only with how operatives have an accident and stop when unsafe site behaviour or conditions are discovered.

A model has been developed to explain how and why any participant involved in a construction project might contribute to an accident. Using such a model, investigation of all the contributory factors could be carried out and the project roles with control over those factors identified. This would lead to more effective accident prevention strategies. Such a strategic approach should take account of construction management, project management and design, as well as client and environmental factors related to project conception.

This paper describes this model, based on a theory of construction accident causation that models the complex interaction of all project participants. This paper describes findings of analysis of 1000 accident cases. First, basic principles of the constraint-response theory are