

Reaching New Levels: Using Systems Thinking to Analyse a Major Incident Investigation

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Abstract : The significance of high consequence, workplace failures within construction continues to resonate with a combined average of 12 fatal incidents occurring daily throughout Australia, the United Kingdom, and the United States. Within the Australian construction domain, more than 35 serious, compensable injury incidents are reported daily. These alarming figures, in conjunction with the continued occurrence of fatal and serious, occupational injury incidents globally suggest existing approaches to incident analysis may not be achieving required injury prevention outcomes. One reason may be that, incident analysis methods used in construction have not kept pace with advances in the field of safety science and are not uncovering the full range system-wide contributory factors that are required to achieve optimal levels of construction safety performance. Another reason underpinning this global issue may also be the absence of information surrounding the construction operating and project delivery system. For example, it is not clear who shares the responsibility for construction safety in different contexts. To respond to this issue, to the author's best knowledge, a first of its kind, control structure model of the construction industry is presented and then used to analyse a fatal construction incident. The model was developed by applying and extending the Systems Theoretic and Incident Model and Process method to hierarchically represent the actors, constraints, feedback mechanisms, and relationships that are involved in managing construction safety performance. The Causal Analysis based on Systems Theory (CAST) method was then used to identify the control and feedback failures involved in the fatal incident. The conclusions from the coronial investigation into the event are compared with the findings stemming from the CAST analysis. The CAST analysis highlighted additional issues across the construction system that were not identified in the coroner's recommendations, suggested there is a potential benefit in applying a systems theory approach to incident analysis in construction. The findings demonstrate the utility applying systems theory-based methods to the analysis of construction incidents. Specifically, this study shows the utility of the construction control structure and the potential benefits for project leaders, construction entities, regulators, and construction clients in controlling construction performance.

Keywords : construction project management, construction performance, incident analysis, systems thinking

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