

Applying Resilience Engineering to improve Safety Management in a Construction Site: Design and Validation of a Questionnaire

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Abstract : Resilience Engineering is a new paradigm of safety management that proposes to change the way of managing the safety to focus on the things that go well instead of the things that go wrong. Many complex and high-risk sectors such as air traffic control, health care, nuclear power plants, railways or emergencies, have applied this new vision of safety and have obtained very positive results. In the construction sector, safety management continues to be a problem as indicated by the statistics of occupational injuries worldwide. Therefore, it is important to improve safety management in this sector. For this reason, it is proposed to apply Resilience Engineering to the construction sector. The Construction Phase Health and Safety Plan emerges as a key element for the planning of safety management. One of the key tools of Resilience Engineering is the Resilience Assessment Grid that allows measuring the four essential abilities (respond, monitor, learn and anticipate) for resilient performance. The purpose of this paper is to develop a questionnaire based on the Resilience Assessment Grid, specifically on the ability to learn, to assess whether a Construction Phase Health and Safety Plans helps companies in a construction site to implement this ability. The research process was divided into four stages: (i) initial design of a questionnaire, (ii) validation of the content of the questionnaire, (iii) redesign of the questionnaire and (iii) application of the Delphi method. The questionnaire obtained could be used as a tool to help construction companies to evolve from Safety-I to Safety-II. In this way, companies could begin to develop the ability to learn, which will serve as a basis for the development of the other abilities necessary for resilient performance. The following steps in this research are intended to develop other questions that allow evaluating the rest of abilities for resilient performance such as monitoring, learning and anticipating.

Keywords : resilience engineering, construction sector, resilience assessment grid, construction phase health and safety plan

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