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Interactional Analysis of Emergent Risks in Institutionally Diverse Construction Projects

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ABSTRACT: In this research, the concept of emergence in a complex system of systems (SoS) is studied and the need for analysis of consequent dynamics at different levels of the construction industry is discussed. At the construction project level, emergence can be observed in the form of conflicts, project renegotiations, policy enforcements, write-offs from projects, etc. These dynamics occur at the level of a large-scale system (i.e., project), which is built from components that are systems themselves (i.e., actors). The complexity trend of these projects is increasing not only technologically, but on several other fronts, such as the institutional diversity of actors, and the coupling of their interactions. Reflecting this trend within the analysis provides a better understanding of emergent dynamics that arise, for example, from social and political interactions. The extensive list of projects challenged by these dynamics includes critical megaprojects and infrastructures in different contexts. In particular, this presentation focuses on the analysis of interactions as a coupling of complex systems (i.e. actors) in institutionally diverse projects (i.e. SoS) at three major stages of: i) defining emergent risks based on its interactional elements, ii) quantifying emergent risks based on the equilibria of the interaction, and iii) mitigating the emergent risks at the policy and strategy levels. After discussion of the cases in infrastructure development in developing countries, the presentation is closed with suggestions on further applicability of the interactional analysis for different collaborative decision-making contexts.