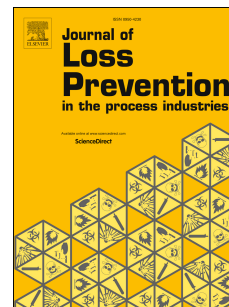


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A Resilience Index for Process Safety Analysis

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Abstract

Qualitative risk analysis is focused on applying methods to prevent accidents in diverse process plants. However, the numerical number resulting in the QRA tells nothing about the ability for systems' recovery if an upset related to safety occurs in the process. Hence a resilience study is required to produce this additional information related to process safety. The resilience index can thus be defined as the proportion of success in recovering the system compared to a number of safety-related upsets. The failure in recovering strongly depends on type and quality of safety barriers, i.e. technology, but also on organizational principles. In this work, a resilience index is proposed to cope with the missing information to characterize safety in a process system. A strategy based on Monte Carlo simulation is proposed and carried out to quantitatively estimate the resilience index for safely protected systems. These results provide means to compare processes from a more general safety point of view.

Keywords: Resilience; QRA, Flexibility; Monte Carlo simulation; Safe Failures; LOPA.

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