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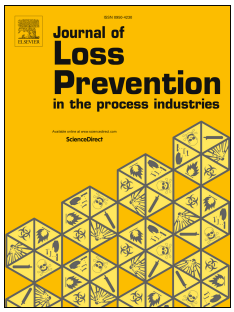

On the completeness of scenario identification in process hazard analysis (PHA)

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ON THE COMPLETENESS OF SCENARIO IDENTIFICATION IN PROCESS HAZARD ANALYSIS (PHA)

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Abstract

Process hazard analysis is used to identify hazard scenarios so that the adequacy of process safeguards in protecting against incidents can be addressed. Of course, it is unlikely that this objective can be achieved with an incomplete set of scenarios. Also, scenarios from PHA are used as the basis for risk analysis studies such as LOPA and QRA which depend on having a complete set of scenarios to avoid underestimation of risk. Consequently, PHA studies should strive to identify hazard scenarios as completely as possible. The completeness of scenario identification is the most important issue for PHA. Missed scenarios can equate to the occurrence of incidents.

The ability to achieve the identification of a complete set of hazard scenarios is limited by a number of factors. They include technical constraints posed by PHA methods and practices, human behaviors during PHA study sessions, and poor quality assurance and control in conducting studies. The latter arises from both external factors that adversely impact PHA team performance and internal factors that detract from the effectiveness of studies. This article identifies and discusses these factors and makes recommendations on how they can best be managed.

Key words: Process hazard analysis; PHA completeness; PHA quality, HAZOP.