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Assessment and Mitigation of Natech events caused by floods

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Abstract

Recent events pointed out the relevance of threats deriving from natural events impacting on chemical and process facilities where relevant quantities of hazardous substances are present. The framework of climate change is also causing the increase in the frequency of floods and intense storms resulting in the damage of facilities and in the release of hazardous substances, causing concerns for the safety of population, the protection of the environment and asset integrity. The specific features of technological accidents triggered by natural events are recognized since several years and the term Natech (Natural events causing a technological accident) is now used to identify such accident scenarios. The present contribution presents and further develops the framework for the analysis of Natech scenarios, also with reference to recent events that took place in Europe and in the US. Beside the conventional approach based on scenarios caused by the damage of equipment, a new framework is introduced to identify and assess specific accident scenarios caused by the loss of critical utilities (nitrogen, instrument air, cooling water, steam, etc.). Natech events caused by floods and the related cascading events were addressed, in the light of the methods and tools available for quantitative risk assessment.