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Accident Scenarios triggered by Lightning Strike on Atmospheric Storage Tanks

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ABSTRACT

Severe Natech accidents may be triggered by lightning strike affecting storage tanks containing relevant inventories of hazardous materials. The present study focused on the identification of event sequences and accident scenarios following lightning impact on atmospheric tanks. Reference event trees, validated using past accident analysis, are provided to describe the specific accident chains identified, accounting for reference protection and mitigation safety barriers usually adopted in current industrial practice. An overall methodology was outlined to allow the calculation of the expected frequencies of final scenarios following lightning impact on atmospheric storage tanks, taking into account the expected performance of available safety barriers. The methodology was applied to a case study in order to better understand the data that may be obtained and their importance in the framework of quantitative risk assessment (QRA) and of the risk management of industrial facilities with respect to external hazards due to natural events.

Keywords:

Natech; Major Accident Hazard; Quantitative Risk Assessment; Lightning; Active Fire Protection; Atmospheric Tank; Accident Scenarios.

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