

Uncertainty in the assessment of BLEVE risk in process plants and in transportation

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BLEVE explosions keep occurring from time to time in process plants, storage and transport by road or rail. Concerning the materials, the highest contribution is that from LPG and water, but many other liquids can also be involved; depending on their properties, the explosion can be followed by a fireball or a toxic cloud. Although diverse models and methodologies have been proposed to calculate the mechanical effects from a BLEVE, this prediction is subjected to a series of uncertainties: pressure inside the vessel, amount of material contained, contributions to the energy released (vapor expansion, liquid flashing), fraction of energy released devoted to create overpressure. Another important aspect to consider is the time to failure in a situation which can lead to the explosion. Due to these uncertainties, a series of assumptions must be applied –besides the classical use of expected probabilities or failure frequencies– to perform the risk analysis. In this communication these different points are analyzed and the corresponding practical criteria are proposed, based on the analysis of two cases.

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