

Capability of GIS in the analysis of explosion hazard from BLEVE event in LPG terminal

ABSTRACT

Geographical Information System (GIS) is getting popular in controlling of risk in chemical installations for handling hazardous substances. The capability of GIS is to combine image map with the corresponding information at each level offering is being recognized as a new dimension to the management of industrial safety and environment surrounding. Catastrophic failure of liquefied petroleum gas (LPG) terminal is always regarded to failure its storage tank. A BLEVE is recognized as one of the worst type accidents cause of life and property. Consequences of BLEVE event are rapid and include peak over pressure from the blast, missiles projection from ruptured vessels and broken structures. This paper emphasizes on a methodology to evaluate effects of peak over pressure and missiles events from the BLEVE hazard due to catastrophic failure of a storage tank which filled by 140 tons of LPG. TNT model and selected equations are used to estimate the probability of fatality and structure damages and GIS techniques is used as a tool for analysis explosion due to a BLEVE event in LPG terminal. The developed technology capable to estimate explosion effects from a BLEVE event in which the result of consequences are plotted by buffer zones 10%, 50%, and 90% likelihood for managing risk in an industrial zone. Stakeholders can make use the developed technology for mitigating risk of LPG explosion in a LPG terminal and also for future land development in the areas outside of an industrial zone.

Keyword: LPG; GIS; BLEVE; Probit; Explosion