

Radiation and Explosion Modelling of Pressurized Propylene Storage Failure in Refinery using PHAST 6.7 Software

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ABSTRACT : *The effects of propylene stored in pressurized spherical vessel were investigated using radiation & explosion modeling using PHAST 6.7 software in one of the refinery in Malaysia. The simulations were performed for various weather conditions with different leak scenarios in deterministic approach. Modeling approach was standard with current industry practice. Resulting events such as jet fire, vapor cloud explosion, boiling liquid evaporating vapor explosion effects shown in thermal radiation and overpressure towards targeted technical buildings. The effects of resulting jet fire flame length increase with release rate and explosion overpressure effects increase with degree of confinement and volume fraction respectively. The results were reviewed, interpreted against industry standard. The sensitivity cases show that, using lower inventory with moderate operating conditions will keep the consequence in acceptable region. This consequence analysis will form a basis for layout development, safety distance and fire zone segregation during conceptual design stage. Propylene storage conditions, layout arrangements and blast protections were recommended as part of preventive and mitigative measures.*

Keywords - *Boiling Liquid Evaporating Vapor Explosion (BLEVE), Consequence, Jet Fire, Propylene, Overpressure, Storage*

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