

BLEVE during unloading LPG

EPSC Learning Sheet July 2024



What Happened:

A leakage occurred during unloading of a truck containing Liquid Petroleum Gas (LPG) in a chemical plant. The LPG caught fire and heated the truck, resulting in a Boiling Liquid Expanding Vapor cloud Explosion (BLEVE).



Aspects:

- LPG is typically stored at ambient temperature at pressures around 6 barg. This makes it susceptible for a BLEVE, that generates a strong destroying pressure wave.
- (Un-)loading of propane requires specific design and operational procedures including:
 - Programming of the volume to be loaded and a system for checking the quantity, to avoid overflow.
 - Periodic inspection of flexible hoses/loading arms.
 - Use of break-away couplings and maximum flow valves.
 - Gas/fire detection with automatic stop of the transfer.
 - Sloping area in unloading station so spilled liquid is removed.
- Ex zoning and avoiding ignition sources in LPG area's.
- Calculate BLEVE consequences and use the results to optimize plant design and emergency response.

Avoid BLEVE when working with LPG