Comparative Risks Associated With the Transport of LPG by Pipeline, Railcar, and Tanker Truck

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ABSTRACT

Accidental releases from LPG transport vessels and pipelines can cause devastating damage and loss of life. When a release occurs in equipment that handles LPG, the highly pressurized system can flash into vapor phase, causing a rapidly expanding flammable vapor cloud containing LPG vapor, air, and liquid LPG aerosol droplets. A release from isolated LPG vessels such as railcars and tanker trucks can cause a boiling liquid expanding vapor explosion (BLEVE). Due to the potential hazards associated with transport of LPG and the fuel’s ever-increasing demand, it seems prudent to compare the risk associated with different forms of transportation of LPG. Consequence simulations are performed using CANARY by Quest® in order to model the effects of LPG releases from pipelines, tanker trucks, and railcars. The results of the consequence analysis are combined with accident, failure, and release frequency data for the specific equipment employed for each transportation method. The transportation risk associated with pipelines, railcars, and tanker trucks was evaluated with a quantitative risk analysis. The result shows that transporting LPG by pipeline has a significantly lower public risk than transporting LPG by railcar or tanker truck.