

Assessment of LNG Pool Spreading Behavior in Brayton Fire Training Field tests

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Abstract

A failure in a LNG storage vessel can lead to the rapid release of the entire contents. This can form a pool that spreads on the surface it contacts. A data analysis is performed to study the LNG pool spreading behavior on water. The data was collected in the TEEX Liquefied Natural Gas (LNG) tests conducted by the Mary Kay O'Connor Process Safety Center in 2007. The tests were a part of medium-sized experiments carried out in Brayton Fire Training Field (BFTF) which is a part of Texas A&M University System. The data set represents a medium scale semi-continuous spill in a confined area for a specified duration of time. Knowledge of the pool diameter, pool height and spreading rate were found to be important in calculating the mass flux of the vapor. It is observed that the LNG pool tends to be in the film boiling regime initially and then moves to the transition regime with time. The boil-off rates were observed to be very high initially and tend to reduce once the pool had reached equilibrium. Based on the data analysis, key parameters governing the pool spreading were identified.

Keywords: Data Assessment, Pool Spreading, Vaporization, LNG, Source Term