FORCED DISPERSION OF LNG VAPOR WITH WATER CURTAIN

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ABSTRACT

Installation of effective safety measures to prevent and mitigate an accidental LNG release is critical. Water curtains are usually inexpensive, simple and reliable and currently have been recognized as an efficient technique to control and mitigate various hazards in the process industries including LNG industry. Actions of a water spray consist of a combination of several physical mechanisms. Detailed analysis of the complex mechanisms and the effects of water spray features to control and mitigate potential LNG vapor cloud are still unclear. This paper discusses the experimental research conducted by MKOPSC to study the physical phenomena involved and the effect of different types of water curtains parameters when applied for LNG vapor. The data from medium scale out-door experiments at the Brayton Fire Training School (BFTF), Texas, are summarized here to understand the relative importance of induced mechanical mixing effects, dilution with air, and heat transfer between water droplets and the LNG vapor. Field test results have determined that water curtains can reduce the concentration of the LNG vapor cloud. Due to the water curtain mechanisms of entrainment of air, dilution of vapor with entrained air, transfer of momentum and heat to the gas cloud, water curtain can disperse LNG vapor cloud to some extent.

Keywords: LNG; Water curtain; Vapor cloud; LNG spill