LNG Vapor Cloud Dispersion with Water Spray Curtain

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Abstract

Water spray curtain is currently recognized as an effective technique to control and mitigate various hazards in the industries. It has been used to absorb, dilute and disperse toxic or flammable vapor cloud. It is also used as protection against heat radiation, in case of fighting vapor cloud fire. Water curtain has also been suggested as one of the most economic and promising LNG vapor cloud control techniques to reduce the size of the “exclusion zone”. Water curtains are expected to enhance LNG vapor cloud dispersion mainly through two mechanisms: mechanical effects of forced dispersion as well as dilution, and thermal effects. The actual phenomena involved in LNG vapor and water curtain interaction was not clearly established from previous research. Also, important parameters such as the types and height of water curtain, water pressure, and the ability to reduce LNG vapor dispersion have not been studied in detail. This paper presents the experimental methodology and experimental results to study the physical phenomena as well as the effectiveness of a water spray curtain to disperse LNG vapor cloud.