Design of Experiments for LNG Spills on Land

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ABSTRACT

Current LNG plant operating practices and safety factor considerations used in overall plant design and construction have indicated that the probability of a massive LNG spill on land is exceedingly remote. However, concerns have been raised over the spill response technology. Extensive tests conducted by American Gas Association (AGA) and University Engineers Inc. in the 1970s were primarily intended to quantify the effectiveness of various LNG vapor cloud control methodologies such as high expansion foams and dry chemicals. The design of LNG experiments as a topic of this paper is intended to discuss the experimental set-up that will be used to analyze small-scale LNG spill mitigation techniques, while also addressing some of the important issues relating to modeling of LNG vapor cloud hold-up. This is particularly important because it provides the LNG sump/dike design engineer to test designs that would mitigate vapor travel. A series of tests are proposed to be carried out by BP (North America) in conjunction with the LNG training facilities at the Texas A&M Brayton fire school. The experimental data obtained will be used to validate existing vapor hold up models and consequently to develop better experimental designs for future research.