Visualization of Liquefied Natural Gas (LNG) Spill and Dispersion: Safety Assessment

Subramanya Nayak¹, Tomasz Olewski¹,², Omar Basha¹, and Simon Waldram¹
¹Department of Chemical Engineering, Texas A&M University at Qatar (TAMUQ), PO Box 23874, Education City, Doha, Qatar
²On leave from Department of Occupational Safety Engineering, Technical University of Lodz, 90-924 Lodz, Poland

ABSTRACT

In recent years the demand for the natural gas has augmented significantly, leading to new natural gas processing units and Liquefied Natural Gas (LNG) storage terminals. Increased production and storage of LNG has also increased the concern regarding the risks associated with LNG spills. An improved understanding regarding the nature and the behavior of the LNG spills in the complex geometries will help in developing better safety guidelines. Accordingly, this study focuses on visualization of LNG spill and dispersion in a 3-D environment. A theoretical model that considers the loss of LNG containment, evaporation, dispersion, and warming is developed and numerically solved using commercial CFD codes such as, FLUENT and FLACS. The Immersive Visualization Facility (The CAVE) at TAMUQ is utilized to stereoscopically display the simulated results.