

Radiation Effects on Boil-Off-Gas in an Above Ground LNG Storage Tank

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Abstract

This study deals with evaporation phenomenon of liquefied natural gas (LNG) during its storage in an above ground tank. The LNG is stored at -162°C in heavily thermally insulated tanks. Due to imperfect insulation, heat leaks from the surrounded environment cause substantial losses by evaporation. The rate of generated vapors (Boil-off-Gas) depends essentially on the storage conditions (composition of the LNG, storage pressure, materials and dimensions of the tank, climatic conditions of surrounded environment, etc.). The objective of the present study is the evaluation of the radiation heat transfer from sidewall surface to LNG liquid surface under real storage conditions relevant to the Skikda's liquefaction plant during in Algeria. Three different relative positions of the liquid surface corresponding to three LNG filling level in the tank were considered. The results show that the radiative heat transfer mode plays an important role in the evaporation phenomenon (more than 50% of the total heat leakages). The results we have obtained tend to confirm that the thermal radiation cannot be neglected.

Keywords

LNG storage tank, Boil-Off-Gas, Surfaces Radiation, Radiosity, Storage conditions.

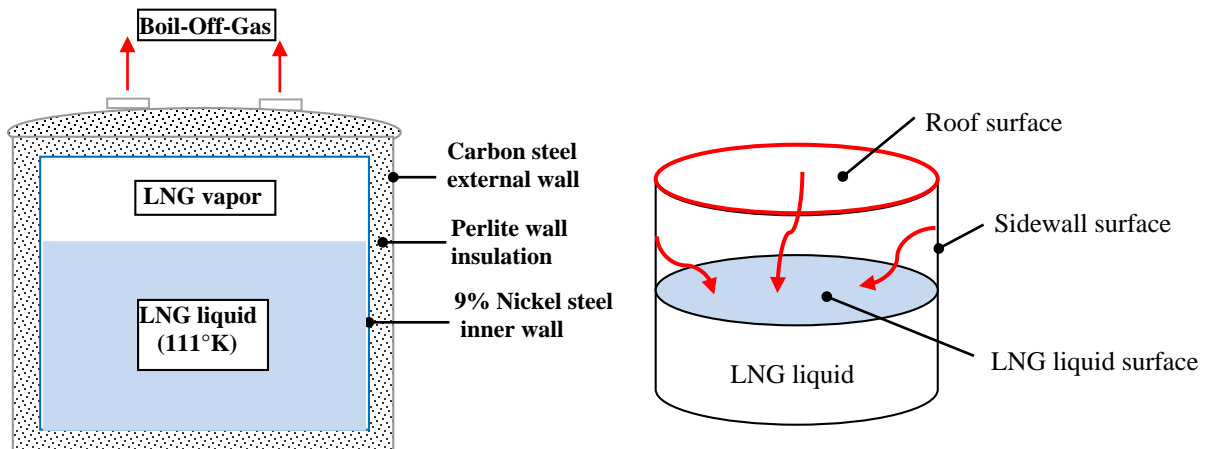


Figure1. Storage tank and radiation phenomenon

Acknowledgements

This work was supported by a research grant (PRFU project: A05N01UN350120180002) from Ministry of Higher Education, Algeria.

Biographies

Mohammed Cherifi received the Engineering degree and Master degree in mechanical engineering from Boumerdès University, Algeria, in 2003 and 2009, respectively. He received an Msc degree in asset management with health, safety and environment from The Robert Gordon University, Aberdeen, U.K. in 2006. He earned his PhD degree in 2017. His research interests are in the thermal/fluid sciences.

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