

Study of Heat Transfer by Natural Convection in Overhead Storage Tank of LNG

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Abstract : During the period storage of liquefied natural gas, stability is necessarily affected by natural convection along the walls of the tank with thermal insulation is not perfectly efficient. In this paper, we present the numerical simulation of heat transfert by natural convection double diffusion,in unsteady laminar regime in a storage tank. The storage tank contains a liquefied natural gas (LNG) in its gaseous phase. Fluent, a commercial CFD package, based on the numerical finite volume method, is used to simulate the flow. The gas is just on the surface of the liquid phase. This numerical simulation allowed us to determine the temperature profiles, the stream function, the velocity vectors and the variation of the heat flux density in the vapor phase in the LNG storage tank volume. The results obtained for a general configuration, by numerical simulation were compared to those found in the literature.

Keywords : numerical simulation, natural convection, heat gains, storage tank, liquefied natural gas

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