

Multi-floor Layout Design of the Liquefaction Process Systems in LNG FPSO Using MILP Optimization: A Comparison of a Cascade Process, a Mixed Refrigerant Process, and an Expander Process

황보순호, 이건홍, 한지훈<sup>1</sup>, 이인범<sup>†</sup>

포항공과대학교; <sup>1</sup>전북대학교

(iblee@postech.ac.kr<sup>†</sup>)

Demands of Liquefied Natural Gas (LNG) are increasing all over the world. LNG Floating, Producing, Storage, and Offloading (LNG FPSO) has been being taken into account one of the methods for offshore LNG production. The biggest characteristic of LNG FPSO is that Natural Gas (NG) from the bottom of a sea is liquefied on the ship by a liquefaction process. This liquefaction process system is built on topsides which is one of LNG FPSO units; a hull, turret, and topsides. As all equipment should be constructed on the ship, the total area is restricted and multi-floor layout is considered. Most published studies related to layout optimization of the liquefaction process system of LNG FPSO have focused on Mixed Refrigerants (MR) module. However, a variety of the liquefaction process systems exist in procedure of producing LNG. In this study, multi-floor layout optimization was applied for other typical liquefaction process systems including MR module.