

### Mixed-refrigerant Optimization in LNG liquefaction Process

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In recently, natural gas is growing rapidly because of depletion of crude oil and environmental restriction. For long distance transportation of natural gas, natural gas liquefaction has many advantages than pipe line transportation. LNG production is energy intensive process because of wide range of temperature from ambient condition to  $-161^{\circ}\text{C}$ . For this reason, there are several liquefaction processes for energy saving. Searching optimal process condition is very difficult due to large system and highly nonlinear programming. There are three design variables to reduce energy consumption during natural gas liquefaction. Pressure level, refrigerant flow rate, and refrigerant composition play an important role in affecting the overall performance. Compressor as a major energy consumption unit in LNG plant spends according to flow rate and pressure ratio, so refrigerant composition is major design variable. In this paper, searching optimal condition is carried out by using sequential optimization. R&D Center funded by the Ministry of Land, Transportation and Maritime Affairs(MLTM) of the Korean government.