

## **Effect of Varying Mixed Refrigerant Composition on Main Cryogenic Heat Exchanger Performance**

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**Abstract.** LNG plant requires a lot of energy for its production especially in liquefaction process. One of the reasons is due to inefficiency on some of its major equipments, particularly on Main Cryogenic Heat Exchanger (MCHE). The efficiency of this unit can be improved by the usage of Mixed Refrigerant (MR) which matches closely the heating curve between hot and cold stream. However, the study on this refrigerant is complex and tedious due to multi component refrigerant and phase changing process inside MCHE. In this study, effect of varying MR composition towards MCHE performance is analyzed, with focus on heat transfer coefficient in shell side of MCHE. The analysis was based on single and two phase flow conditions which are gas flow and liquid falling film flow. The adjustment of binary components in MR composition was studied for each flow regime. By doing this, the best composition adjustment that gives the highest value of heat transfer coefficient was determined. It was found that the adjustment of methane-propane ( $C_1$ - $C_3$ ) is the best arrangement for both cases. However, it needs to be tested by applying this to actual process condition, in this case by implementing it in simulated LNG process.