

Energy optimization by modifying SMR natural gas liquefaction cycle through vortex tube

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The assortment and advancement of the natural gas liquefaction process with the minimum energy consumption, proffer high promising energy and cost benefits. The possibility of up gradation and modifying in the refrigeration system by intensifying or replacing the expansion device has been investigated. In this research, energy consumption for the Single Mixed Refrigerant (SMR) natural gas liquefaction process as an objective function is optimized by modifying the SMR liquefaction cycle by introducing the vortex tube before and after SMR condenser. Study shows that the Coefficient of Performance (COP) improvement using vortex tube as an expansion device are dependent on the refrigerant composition, operating conditions as well as cycle configurations. This research was supported by a grant from the Gas Plant R&D Center funded by the Ministry of Land, Transportation and Maritime Affairs (MLTM) of the Korean government and also was supported by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).