

Operational optimization of SMR natural gas liquefaction (LNG) process using Krill-herd optimization algorithm

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A biologically-inspired naming as “krill-herd” search algorithm (KHO) was investigated for the optimization of a single mixed refrigerant (SMR) natural gas liquefaction (LNG) process. The optimal design of an LNG process involves multivariable non-linear thermodynamic interactions, which leads to entropy generation and contribute to process irreversibility. SMR process was modeled using the Aspen Hysys® and the resulting rigorous model was connected with the KHO optimization algorithm coded in MATLAB. The optimal operating conditions found by the KHO algorithm significantly reduced the required energy of the SMR process and improved the coefficient of performance (COP) in comparison with the base case. This research was supported by the Basic Science Research Program Foundation of Korea (NRF) funded by the Ministry of Education (2018R1A2B6001566), the Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189), and the Engineering Development Research Center (EDRC) funded by the Ministry of Trade, Industry & Energy (MOTIE) (No. N0000990).