

Simulation-optimization of N2 expander process

송기욱, 한중훈*

서울대학교

(chhan@snu.ac.kr*)

Natural gas liquefaction plant utilizes various types of liquefaction cycles including cascade processes, mixed refrigerant processes and single refrigerant processes. For offshore natural gas production, floating production, storage and offloading units (FPSOs) are used. For these FPSOs, liquefaction cycles using hydrocarbons as refrigerants are not recommended for safety issues. Therefore N2 expander process is recommended. Here we introduce a simulation-based optimization framework using space-mapping methodology. First, an initial design is conducted on a commercial simulator. Then, design variables are decided. Third, minimum and maximum ranges of the design variable are determined. We will call this the design space. Fourth, a comprehensive simulation of the design space is done. Next, empirical modeling of this design space is performed. Finally, optimization algorithm using SQP is applied to the developed model.