

Optimal design of inherently safer natural gas liquefaction process

허창환, 이용석, 이종민[†]
서울대학교 화학생명공학부
(jongmin@snu.ac.kr[†])

Most process safety approaches like quantitative risk assessment (QRA) or hazard and operability (HAZOP) studies are considered at the end of the design procedure. However, they require a long time and expensive cost due to their repetitive and time-consuming nature. This study aimed to design an inherently safer process to consider the economic feasibility and the safety of the process simultaneously. The method uses the potential risk as the second objective function while using the total annual cost as the first function. The risk was assessed and quantified implementing quantitative risk assessment procedure directly into the optimization sequence. Sequential quadratic programming (SQP) was employed to the natural gas liquefaction processes to obtain the optimal design solution. The associated results indicate the compromised trade-off relation between the two objective functions.