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SCIENTIFIC & RESEARCH PROJECTS

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Project Title:

Integration of Flare Gas with Fuel Gas Network in Refineries

Abstract:

The high price of crude oil, strict environmental regulations and ever-increasing demand for energy have made refineries adopt a more holistic approach to integrating energy, economics and environment in their design and operation. Gas flaring is a major factor for the wastage of energy in oil and gas industries that could be better utilized and even generates revenue. Integration and use of wasted and flared gases with fuel gas network (FGN) is an effective approach for reducing GHG emissions as well as conserving energy in refineries. In this paper, current FGN model introduced by Hassan et al. was modified and also a novel methodology was presented for grass-root and retrofit design of FGNs using integration of flare gas streams. GHG emission concept is added to the base model as new constraint to control and minimize the flaring. A FGN proposed for a refinery case study with integration of flare gas streams indicated a 12% reduction in natural gas consumption compared to the non-integrated flare gas stream case and a 27.7% reduction compared to the base case with no FGN. In the retrofit case, results suggested that the maximum utilization of flare gas streams can be the most profitable solution.