Optimisation of Heating Medium System for Offshore Platform

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Abstract

Heavy crude oil produced from reservoir normally requires heating in order to facilitate proper oil water separation at the separator. Providing heat helps to reduce the viscosity of the crude thus reducing the residence time required at the separator and its size. In conventional heating utility system, the heating medium is supplied to its users in parallel design where all the users receive the heating medium at the supply temperature. This design however may lead to overdesign of the heating utility system. In this paper, a novel superstructure approach is proposed to determine the optimum network design of the heating medium system with minimum total annualised cost. The novelty of this approach is that it allows determination of the global optimum solution for the system while taking into consideration of all possible network configuration. The approach caters for capital and operating costs trade-off for the heat exchanger network (HEN) and waste heat recovery unit (WHRU) in the heating utility system. An industrial case study is used to elucidate the newly proposed technique.