

ABSTRACT

HYSYS Modeling of the Distillation Sections of two similar Methanol Plants used for Performance Evaluations and Optimization

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The distillation sections of two similar Methanol plants, M3 and M4 on the Methanol Complex, consisting of a Topping and a Refining column, were modeled using the simulation program HYSYS. This was done to verify that evaluations on these sections could be carried out by simulation so that potential plant problems could be quickly and easily predicted. Performance criteria were then developed for evaluation of the columns using these models, following which optimization evaluations were carried out to identify the lowest operational cost which could be achieved on each plant. The models of the distillation columns were subject to limitations with the measured data, HYSYS program and the property packages used.

It was found that the Topping and Refining columns had Murphree tray efficiencies that were close to typical design efficiencies for sieve trays and also that the distillation section on M4 ran at a lower overall operational cost than M3.

In addition, it was found if the pressure was increased to the upper design limit on the Topping column this would reduce operational cost. Application of a reduction in pressure, lowering feed tray location and increasing fusel oil draw-off were also shown to reduce the operational cost on the Refining column. The establishment of these optimized parameters was constrained by the columns' overhead condensers' ability to maintain column pressure and reduced overall plant efficiency with increase fusel oil draw-off.

Constraints on the overhead condenser duties and limitations on process parameters do not allow optimized conditions to be implemented easily and it is recommended that the parameters be left as they are at present.

Keywords: Natasha Christine Lopez; Distillation; HYSYS; Optimization; Methanol