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Cairo University

ENERGY ANALYSIS AND PROCESS OPTIMIZATION OF CDU FOR PRODUCTS REDISTRIBUTION

By

MARWA AHMED ABU-ELMAGD EL-SADEK

A Thesis Submitted to the
Faculty of Engineering at Cairo University
in Partial Fulfillment of the
Requirements for the Degree of
MASTER OF SCIENCE
in
CHEMICAL ENGINEERING

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Key Words:

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Summary:

The present study introduces a general methodology based on rigorous simulation and optimization framework that targets both the distillation column and the heat exchanger network to maximize the use of existing equipment. The revamping includes multiple objective functions such as capacity enhancement, energy savings, emissions reduction and profit improvement. An actual CDU Egyptian refining plant has been considered for this study, a simulation model and validation are initiated via case study by ASPEN HYSYS to generate different operating scenarios which are able to optimize the operating conditions according to the products specifications, without any change in equipment design at constant crude feed rate. Also; these models were being subjected to energy analysis to choose the best model in energy saving and reduction CO₂ emission. ASPEN ENERGY ANALYZER was applied to create energy analysis for each generated scenario by using pinch analysis, generating composite curve, grand composite curve and utility composite curve.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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