CERTIFICATION OF APPROVAL

Design Optimization of a 2-Phase Gas/Liquid Separator

by

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A project dissertation submitted to the
Mechanical Engineering Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
BACHELOR OF ENGINEERING (Hons)
(MECHANICAL ENGINEERING)

Approved by,

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UNIVERSITI TEKNOLOGI PETRONAS

TRONOH, PERAK

January 2009

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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ABSTRACT

Today, oil and gas companies are focusing on developing smaller and more compact production facilities, hence the requirement for an optimized equipment design to fit this purpose. Separators are one of the main process equipment on the platform. Existing separator design normally results in large, heavy and expensive to purchase piece of equipment. Thus, it will affect the limited space and load requirements on the supporting platform. This will increase the material and installation costs of offshore structures. Hence, the objective of this project is to propose an optimum model of separator design that is fit for purpose. The scope of the project was to study on the separator design consideration and operational constraints used for a liquid gas separation. Case study was carried out on a specific separator using typical reservoir data and suggested area for improvements. The optimization models utilized existing separator design theories and relationships. The models are outlined and discussed in application of horizontal separator designs and its operation. Mathematical programs have been used to find the optimal separator design using the optimize separator model. The methodologies used are conducting literature review on the separator, critical review on the separator sizing rules and equations, performing flash calculation to characterize flow stream, simulating mathematical model and analyze the effect on the constraint design and dimension. The optimized design reduces the size to 30% size based the case study .The study found that the liquid level for the separator should be half of the diameter and the minimum slenderness ratio was found to be 3 and it give the least cost to manufacture.

ACKNOWLEDGEMENTS

First and foremost I would like to praise Allah S.W.T The Most Gracious, The Most Merciful for blessing me to complete my dissertation submission in fulfillment of the requirement for the Bachelor of Engineering (Hons) Mechanical Engineering for a period of 2 semesters beginning July 2008 until January 2009. Throughout the whole period conducting the project, many has provided immeasurable amount of guidance, ideas, assistance, support and advice.

My thank you note starts special thanks to UTP, Mechanical Engineering department and the supportive management for the opportunity given to perform the final year project which has help me develop useful skills and enhance my capabilities as a UTP student.

My deepest appreciation goes to my supervisor, AP. Dr Razali Hamzah for effective support and guidance for me towards of becoming a very responsible, cooperative and devoted student in doing this project. Throughout the project, he had given me a constant guidance and constructive ideas in completing this project successfully.

I would like to take this opportunity to thank my internal examiner, AP. Dr. Fakhruldin for his willingness in sharing his great knowledge with me and also evaluating my project in order to make sure this project is successful.

Lastly, I would like to thank my parents and friends for providing me with moral support throughout the entire process of completing this project and to all who involves directly and indirectly in making my final year project a valuable and beneficial experience.

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