

CERTIFICATION OF APPROVAL

**Design Optimization of a 2-Phase Gas/Liquid Separator**

by

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## **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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FARAH ABD RAHMAN

## **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.

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