CERTIFICATION OF APPROVAL

A Study of Stress Distribution on Centrifugal Compressor Impeller Using Finite Element Analysis

by

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Approved 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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ABSTRACT

The design of turbomachinery has been practiced in the last half of the previous century with increasing degree of sophistication. This trend of development is not complete because design of any turbomachine is interdisciplinary process involving aerodynamics, thermodynamics, fluid dynamics, stress analysis, vibration analysis, the selection of materials, and the requirements for manufacturing. Among these the major one end the most frequently used in the manufacturing of any mechanical part is stress analysis. Thus, this project discusses the study of stress distribution on the impeller of centrifugal gas compressor which is more specifically a single-entry impeller with radial vanes. Finite element analysis was used since it is the best approach to determine the stress distribution using static stress analysis. The von-Mises stress is observed to identify the possible sites of crack initiation on the impeller. Modeling and simulation of the impeller will be done to analyse the failure by using CATIA V5 and ANSYS® Workbench software.

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