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ICOM'08

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AUTOMATION OF PUMP TEST RIG SYSTEM

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ABSTRACT

This paper presents the results of a project in designing and prototyping an automated pump testing machine. This machine is able to produce the primary characteristic curves such as head vs. capacity, power vs. capacity and efficiency vs. capacity for standard centrifugal pumps operated in different modes such as single, serial, and parallel. The paper discusses the pump and piping system operating principles and overview of Lab VIEW software that is used in this project. Based on the detail design and analysis, the test rig system has been fabricated in the lab and preliminary testing has been conducted. The characteristic curves generated by this machine conform to the characteristic curves supply by the pump manufacturer. And also from the experiments performed, it shows that, pumps in a serial operating mode have higher total head whereas pumps in parallel operating mode have higher flowrate.

Key Words : Automation, pump, testing

1. INTRODUCTION

Currently, most of the pump-testing machines available in the market are manually operated [1]. Thus, in this project, we intend to use the advantages of computer automation to control this machine, with the hope that a more accurate, reliable and user friendly pump testing machine can be developed out of this. This project can be divided into three main parts to be accomplished that are mechanical, electrical/electronic and computer aspect.

The main objective of this project is to develop a pump testing machine system that is fully integrated with a data acquisition system and a computer controller [2]. This pump-testing machine will be used as one of experimental equipment for Fluid Dynamics Laboratory.

Some of main experiments that can be conducted by using this machine are:

- i. Demonstration of either series, parallel or single pump operation.
- ii. Comparison of pump characteristics for different modes of operation and at