SUBMERSIBLE VEHICLE – Fully Submerged
(CFD SIMULATIONS)

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A thesis submitted in partial fulfillment of the requirement for award of Bachelor Engineering (Hons) (Mechanical)

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OCTOBER 2003

ACKNOWLEDGEMENT

In the name of ALLAH, the Most Beneficent and Merciful. I praise Him and I seek his blessing on His Noble Prophet Muhammad s.a.w, assalamualaikum w.r.t. I would like to record our gratitude to our project advisor, Prof. Ir. Dr. Ow Chee Sheng for help guidance; advice and continuous support in making this project a success. Also sincere to Mr. Nazri and Mr. Razif for the encouragement and my Project associate Mardiana for her full cooperation. Not forget to all my friends Halim, Norhisyam, Hanif, and Izam for their support.

In carrying out this project, we have received full cooperation from various individuals from UiTM CADEM Center.

Finally, I would wish to extend our sincere to our heartiest thanks to each individual who has given assistance in term of materials, effort and ideals, directly or indirectly. I am also grateful to our family and colleagues for their support and understanding during the preparation of this project.

Thanks, Wassalam.
UiTM Shah Alam.
Selangor Darul Ehsan.

ABSTRACT

The application of Fluid Mechanics in design relies on the use of empirical results built up from an extensive body of experimental research. In many areas empirical data are supplied in the form of tables and charts that the designer may apply directly. Therefore, in the organization of experimental work and the presentation of its results that dimensional analysis plays important role. Dimensional analysis together with similarity and model testing techniques allow the design engineer to predict accurately and economically the performance of the prototype system. The ability to seek numerical solutions of governing equations under a given set of boundary and initial conditions has led to the development of computational fluid dynamics (CFD), a new discipline in fluid dynamics that had to await the availability of computing power. Along with the traditional approaches of experimental and analytical fluid science, CFD is now widely used within a wide range of engineering applications.

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CHAPTER I

INTRODUCTION

1.1 Definition

The origin of the term "submersible" to describe a relatively small vessel capable of operating beneath the ocean surface in contrast to "submarine" is not well documented. As is so often the case with other words it began appearing in the literature with increasing frequency, until now it is generally accepted as the preferred word. A submersible is defined as, "a vessel capable of operating or remaining underwater" and a submarine is, "a ship capable of operating submerged". However, the uses of the word "ship", rather than vessel" implies that a submarine is larger than a submersible, because a vessel is defined as, "a craft, especially one larger than a row boat, designed to navigate on water". This places the boundary limits of the size of submersible as larger than a rowboat, but not as a ship, because a ship is defined as, "any vessel of considerable size..." and a boat as, "a relatively small, usually open craft of a size that might be carried on a ship".