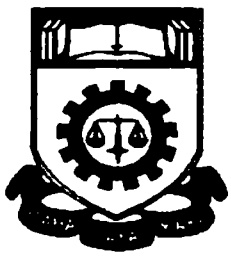

FACULTY OF MECHANICAL ENGINEERING

B. ENG. (HONS) MECHANICAL ENGINEERING

FINAL YEAR PROJECT REPORT
ON
"STUDIES ON THE PERFORMANCE OF ARTIFICIALLY SUBMERGED WATERJET"

BY

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ABSTRACT

The primary purpose of this project is to build up a in house test rig to get it ready to make an analysis on the artificially submerged cavitating waterjet. It also can be used for other researchers to continue the study in artificially submerged waterjet.

The details of the artificially submerged cavitating waterjet test rig are reported. The test rig that has been designed helps in finding the mass loss from the aluminium specimen plate due to cavitation erosion. This work reports how the chamber can facilitate the formation of an artificially submerged cavitating waterjet .

The specimen preparation, the experimental set-up and test condition are reported. We are using three methods in doing our analysis, which are weighing the specimen by electronic balance, use Quick Vision machine and Scanning Electron Microscope.

The mass loss calculated through the theoretical method is compared with that obtained through the experimental method. And we see a good correlation between the two. This model can be used to predict the mass loss of any ship hull material.

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1.0 Introduction.

1.1 Objective.

To commission the test rig for the studies on the cavitation erosion artificially submerged waterjet and to conduct preliminary testing using the test rig.

1.2 Waterjetting fundamentals and applications.[1]

The use of waterjets under pressure has become much more common in recent years for an increasing variety of tasks. As their advantages have become clear, waterjetting equipment has been developed, used and waterjets have become in several industries the accepted method for solving problems.

Waterjetting is, in its simplest form, concerned with the development, the transmission and the application of power. This power is normally created in a water medium by a pump, pushing a given volume of water into a high pressure feed line and providing it with a certain amount of energy in process. This water flows down through the line, usually a strong metal tube over at least part of its length, to a nozzle. The nozzle contains one or more exit holes or orifice, which are normally of a much smaller size than the feed line.

Since a constant volume of water reaches the nozzle it must accelerate to a higher speed in order to escape through these orifices, which also serve to focus the water into coherent stream of jet and to direct the streams towards the required point on the target surface or work piece.