DESIGN OPTIMIZATION OF A MINI HYDRO GENERATOR

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"I declare that this thesis is the result of my own work except the ideas and summaries which I clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree."

Signed : .....

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ABSTRACT

Electricity is an important resource for human needs. Unfortunately, the process of generating electricity mostly produces negative impact such as pollutions to the environment. For this reason, this project is to create a product that can generate electricity in a greener manner. The overall objective of this project is to create a system and device that could generate electricity for household use by utilizing renewable resources. As for this thesis, the author shall focus more on the application performance techniques to optimize the result of the basic design. The basic device consists of a pipe, a turbine propeller, a shaft and a dynamo. The design has been developed by CAD using CATIA software and fabricated using several equipments and technologies such as a Rapid Prototyping (RP) machine. In order to optimize the product output, several factors have been considered. The focus shall be more on variations of the design. Various characteristics including different number of blades and phase angle and various nozzle shapes were employed to improve and maximize the performance output rate of the product at vertical axis operating condition. Several experimental testing have been carried out and as a result, the performance output shows 50% improvement compared to the initial condition. In future, more activities can be considered to obtain greater performance towards the product.

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