DEVELOPING 3-BLADED HELICAL VERTICAL AXIS WIND TURBINE BLADE FOR LOW SPEED WIND

By

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11112048

BACHELOR'S DEGREE
in

MECHANICAL ENGINEERING – MECHATRONICS CONCENTRATION
FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

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Revision after the thesis defense on 23 January 2017

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

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The purpose of this thesis is to perform a research on the design of Helical VAWT (Vertical Axis Wind Turbine). It is known that savonius turbine's maximum TSR (Tip Speed Ratio) to produce maximum power output can't exceed 1 because of it's dependency with drag force caused by the water. The idea is by twisting the blade, we can channel the air flow comes from the top of the blade to the bottom of the blade thus increasing the maximum TSR of the blade. The twisting angle will be determined by the ratio of it's height and diameter.

CFD (Computational Fluid Dynamic) will be used to simulate the design that is created using SolidWork. This thesis project is focusing on the efficiency of the design created using Solidwork and tested in the simulation program called CFD(Computational Fluid Dynamic) and later will be compared with the real design which will be tested on the rooftop of Swiss German University.

Keywords: Helical VAWT, Vertical Axis Wind Turbine, CFD, Computational Fluid Dynamic, Savonius, Paraview,OpenFOAM, Solidworks.

DEDICATION

I dedicate this thesis to my family and friends as a proof of my dedication as a Mechatronics Engineering student.

ACKNOWLEDGEMENTS

Blessed with such a supportive friends and family, i would like to thank God almighty with all my heart. I would like to express my gratitude to the people who help me went through this tiring jurney:

1. Mr Dena Hendriana, M.Sc., Ph.D, as my advisor, for all of his advices, guidance, and patience he provide me with.
2. My family for always mentally support me and always provide me with lots of foods to compensate the stress that i have during my thesis work.
3. My best friends Rizza, Igna, Prastha, Kennan, Jimmy, Bryan , Ferdy, and Clements for all the laughs and all the help they have given me during my thesis work.
4. Last but not least, all of my friends who work in room FB304 Patrick, Yudian, Surojo, Rio, Dega, Tedjo, Owen for keeping my spirit up with all their laughs and helps.

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