

**DEVELOPING THE CONTROL SYSTEM FOR MICRO HYDRO POWER
PLANT WITH CROSS FLOW TURBINE PROVIDED BY ASEAN
HYDROPOWER COMPETENCE CENTER (HYCOM)**

By

Kemal Fakhurrazi Samsulhadi
11110047

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SWISS GERMAN UNIVERSITY

SWISS GERMAN UNIVERSITY
EduTown BSD City
Tangerang 15339
Indonesia

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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.

Kemal Fakhurrazi Samsulhadi

Student

Date

Approved by:

Ir. Arko Djajadi, M.Sc, Ph.D

Thesis Advisor

Date

Dr. Phil. Mathias Guenther, M.Sc.

Thesis Co-Advisor

Date

Dr. Ir. Gembong Baskoro, M.Sc

Dean

Date

Kemal Fakhurrazi Samsulhadi

ABSTRACT

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By

Kemal Fakhurrazi Samsulhadi
Ir. Arko Djajadi, M.Sc, Ph.D, Advisor
Dr. Phil. Mathias Guenther, M.Sc., Co-Advisor

SWISS GERMAN UNIVERISTY

The purpose of this thesis is to develop a system to improve the performance of a micro hydro power plant with 300 mm cross flow turbine that is provided by ASEAN Hydropower Competence Center (HYCOM). The existing system operates in manual mode only as there is no automatic control system for it. Therefore the power quality (frequency and voltage) is not guaranteed to be within a specific operating range that is required by loads.

The main idea of this system is to stabilize the electrical frequency of the power that is delivered to the loads. The first solution is by controlling the input water flowing through the turbine to maintain the rotational speed of the connected generator. It can be done by automatically adjusting the guide-vane's opening size. The second solution is by controlling the output power distribution to the loads to assure that the selected loads always receive the required power with good quality. It can be done by controlling the sequence of load activation. By combining both solutions, the second solution will overcome the limitation of the first solution, and thus improve overall performance.

Keywords: hydropower, micro hydropower, control system for micro hydro, water flow control, electronic load control



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DEDICATION

I dedicate this thesis works to my beloved family, my friends, my lecturers, and HYCOM as the based system provider.



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