



# **AUTOMATED CONTROL APPROACH FOR INDUSTRIAL WELDING TRANSFORMER TO MINIMIZE THE IDLING POWER LOSS**

A dissertation submitted to the Department of Electrical Engineering,  
University of Moratuwa in partial fulfillment of the requirement for the  
degree of Master of Science

by

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2009

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## Abstract

Main objective is to design and implement automated control circuit to switch ON & OFF main power feeding contactor of industrial welding transformer, depend on the work pattern. Voltage sensing at the out put terminals of secondary winding of welding transformer is used as a one and only input signal for the control circuit. Reduced voltage 24 VAC is supplied to primary during idling and during operation it converts in to 400 VAC, and this conversion takes place automatically. By that, able to reduce idling power loss on primary winding due to open circuit core loss & iron loss.

During designing of new system special attention was made, not to change existing conventional welding procedure and not to introduce additional external sensors and cables other than conventional welding electrode and welding cable.

New system was practically implemented in yard and tested for long period of time in different work conditions in Colombo Dockyard PLC. System was tested with existing conventional welders but no behavioral changes were observed during welding operation after implementing new system. Successful trails were carried out and proved it uninterrupt operation.

Under guidance and instructions of my project supervisor I worked and finally able to came up with practically feasible solution. This report describes problem identification, how the design concept developed, power saving and cost benefits .to yard after implementation of new system.

The report starts with an introduction as a 1st chapter where describe the current welding practice at Colombo Dockyard PLC, how to reduce idling power loss by implementing new method and final goal of my project. 2nd chapter describes the statement of the problem and problem identification, new solution and how it affects to save energy.



The 3rd chapter consists with gathered technical data and its analysis during execution of design approach.

Next 4th chapter describe about proposed and implemented solutions for the identified problem and evolution of design concept.

Fifth chapter describes the energy saving calculations and cost benefit analysis. Finally, in the conclusion, I have explained practically and economically viability of new product as a industrial product.

## DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.



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Date: April 30, 2009

~~We~~/ I endorse the declaration by the candidate

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## Acknowledgement

I express my sincere thanks to all the following individuals, those who contributed towards the completion of my final project successfully under my M.Sc/PG Diploma in Industrial Automation 2006/07 course.

At the very beginning my gratitude goes to the project supervisor Dr. Nalin Wickramarachchi, senior lecturer, department of electrical engineering, University of Maratuwa. I am indebted to my project supervisor for his immense guidance and excellent technical advices for success of my project. I would like to extend my sincere thanks to Prof. J. Rohan Lucas, Prof. H.Y. Ranjit Perera, Head department of electrical engineering Prof. J.P. Karunadasa,

Prof.Lanka Udawatta and Dr. Sisil Kumarawadu who gave their valuable advices for success of my project. I would like to take this opportunity to deliver my sincere thank to MD/CEO Mr. Mangala P.B. Yapa and Mr. D.A.P Senasinghe, Assistant Production Manager (Electrical and Automation) for their guidance and opportunity given to me to initiate and execute my project within the yard premises. Again thankful to Mr. D.A.P Senasinghe for his technical advices and immense guidance for the success of my project.

My sincere thanks should also go to the young engineers specially Mr. E. M. M. B Yatiyana and Mr. P. H. K. H Puhulwella in the Electrical and Automation Department. They positively contributed me for the success of my project. Also tanks should also go to electrical workshop engineer Mr. H.R.K.K. Ariyaratne too.

My thanks also go to the instrument technicians from automation workshop who worked under me. Appreciate their work during gathering field data and during execution of project in real situation. I am again thankful to the all of above and success of my project mainly depends upon the help and support given by them.

A.D.M.Jeeth.

April 30, 2009



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