MODELLING AND TRANSIENT ANALYSIS OF CAPACITOR SWITCHING CONNECTED TO ELECTRICAL WIND TURBINE SYSTEM USING SIMULINK SOFTWARE

By

Mohamed Salah Mahmoud Hussein

A Thesis Submitted to the

Faculty of Engineering at Cairo University

in Partial Fulfillment of the

Requirements for the Degree of

MASTER OF SCIENCE

In

Electrical Power and Machines Engineering

FACULTY OF ENGINEERING, CAIRO UNIVERSITY

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Title of Thesis:

Modelling and Transient Analysis of Capacitor Switching Connected to Electrical Wind Turbine System Using Simulink Software

Key Words:
Wind turbines, Power Quality, Transient Overvoltage, Zero-Crossing technique, Modeling and Simulations using Matlab

Summary:

The quality of electric power is very important topic. It has been a major topic of research due to problems, which result in case of poor power quality, which can cause heavy financial losses in different fields. One of the most important aspects of poor power quality is transient which is generated, among other cases, as a result of capacitor switching such as in wind turbine system. In this work the transient over voltage and inrush current resulted from capacitor switching are studied by building a model using matlab Simulink for wind turbine system. To eliminate the originated transients, the synchronous switching technique is used in this work. The simulation shows a significant decrease in the values of overvoltage and inrush current.

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I would like to thank my family for their words of great inspiration and encouragement. Also, I would like to thank all my colleagues for their support to me

DEDICATION

I dedicate this thesis

To

My Father & Mother

Salah Feryal

My Sisters

Hoda Doaa

My Brother

Ahmed

For their love, support and encouragement which make me able to get such success.

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