SOLID STATE CONTROL OF HIGH-SPEED ELECTRIC DRIVES

S. MEHDI MORTAZAVI

INSTRUMENT DESIGN DEVELOPMENT CENTRE
INDIAN INSTITUTE OF TECHNOLOGY, DELHI
NEW DELHI - 110016
1985

SOLID STATE CONTROL OF HIGH-SPEED ELECTRIC DRIVES

by

S.MEHDI MORTAZAVI

INSTRUMENT DESIGN DEVELOPMENT CENTRE

Submitted

in fulfilment of the requirement of the

Degree of

DOCTOR OF PHILOSOPHY

to the

INDIAN INSTITUTE OF TECHNOLOGY DELHI

NEW DELHI - 110016

MAY 1985

CERTIFICATE

Certified that the thesis entitled "Solid State Control of High-speed Electric Drives" which is being submitted by Mr. S.M. Mortazavi, in partial fulfilment for the award of the degree of Doctoral of Philosophy in Electrical Engineering of the Indian Institute of Technology Delhi, is a record of the student's own work carried out by him under our joint supervision and guidance. The matter embodied in this thesis has not been submitted for the award of any other degree or diploma.

B.P. Singh 17.5.85

Co-supervisor:
Prof. B.P. SINGH
Department of Electrical
Engineering, I.I.T. Delhi
New Delhi-110016, India

R. Arockiasamy

Supervisor:
Prof. R. AROCKIASAMY
Instrument Design Development
Centre, I.I.T. Delhi
New Delhi-110016, India

ACKNOWLEDGEMENT

I derive immense pleasure in expressing my sincere thanks and appreciation to Professor R. Arockiasamy, whose continuous manifold guidance and his over-helping attitude throughout the duration of the work has made this investigation possible. I am proud of attending his lectures and working under his supervision.

I wish to thank Professor B.P. Singh for his help and encouragement during the course of this work.

The author wishes to thank Prof. C.S. Jha and Ministry of Education, Govt. of India, for arranging financial assistance.

The author wishes to thank the Heads of Departments of Electrical Engineering and Instrument Design Development Centre for permitting the use of laboratory facilities for this investigation.

The author wishes to thank the Head of Computer Centre for permitting the Computer facilities.

The author wishes to thank the Director, I.I.T. Delhi for providing the opportunity in continuing my higher studies.

The author wishes to thank the Ministry of Education, Government of India, for giving me permission for higher studies in India.

Thanks are due to Mr. A. Anbarasu whose invaluable and timely help in the course of experimentation and analysis contributed towards this research.

The author expresses his sincere thanks to Mr. S.K. Sud and other faculty members of Instrument Design Development Centre for their timely and appropriate suggestions. Special thanks to M/s A. Barat, S. Kumar, R.L. Kapoor, Shiv Ram Singh, Sewa Singh, V.K. Kohli, D.S. Soni, A.K. Puri, J.P. Sharma, S.K. Verma, K.L. Kapoor, R.S. Sharma and Raja Ram for their co-operation. Thanks are due to Mr. Kapoor for tracing figures and to Mr. Y.P. Dogra for typing the manuscript.

I would like to thank and express my sincere regards to my parents, brothers and sister who have supported me not only morally but also financially throughout my education.

I further wish to record my appreciation shown by my wife Rabeh during the course of this project. A lot of physical assistance rendered and sacrifices made by her which I should never forget.

(MEHDI MORTAZAVI)

CONTENTS

PAGE NOS

PAGE NOS.

PAGE NOs.

PAGE NOs.

PAGE NOs.