

CONTENTS

Page No.

CHAPTER ONE

Introduction And Literature Review

1.1 Introduction.....	1
1.2 Wind turbine.....	1
1.3 Self-excited reluctance generator.....	2
1.4 Self excited induction generator.....	5
1.5 Damping and synchronizing torque coefficient.....	7
1.6 Synchronous machine transient stability.....	8
1.7 Electrical torque.....	10
1.7.1 Synchronous torque.....	11
1.7.2 Other electrical torque.....	11

CHAPTER TWO

Modeling of Synchronous Generator With Capacitor Aided Excitation

2.1 Introduction.....	13
2.2 Simulation method.....	13
2.3 Capacitor Aided excitation of synchronous generator modeling.....	14
2.3.1 Transient mathematical model.....	15
2.3.2 Steady – state mathematical model.....	19
2.4 Aided excitation requirements.....	21

CHAPTER THREE

Optimization Of Parameters

3.1 Introduction.....	26
3.2 Optimization algorithm.....	26
3.3 Optimized parameters.....	28

CHAPTER FOUR

Analysis And Discussion

4.1 Introduction.....	35
4.2 Synchronous machine boosted by a bank of capacitor.....	35
4.2.1 Influence of the degree of boosting.....	36

4.2.2 Response without boosting.....	54
4.2.3 Fast Fourier Transform analysis.....	57
4.2.4 Critical Fault Clearing Time.....	62

CHAPTER FIVE

Conclusion.....	63
References.....	64
Appendix A.....	65
Appendix B.....	66