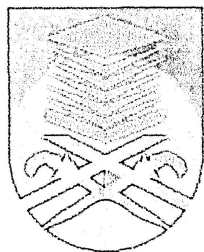


**AVAILABLE TRANSFER CAPABILITY COMPUTATION
BASED ON GENETIC ALGORITHM**

Thesis is presented in partial fulfillment for award of the
Bachelor of Electrical Engineering (Honours)
UNIVERSITI TEKNOLOGI MARA



**SAIFUL HAFIZ BIN JUHARI
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM
SELANGOR DARUL EHSAN
MALAYSIA**

ACKNOWLEDGEMENT

In name of Allah S.W.T, the most Gracious who has given me the strength and ability to complete this project and thesis. All perfect praises belong to Allah S.W.T, lord of the universe. May his blessing upon the prophet Muhammad S.A.W and member of his family and companions.

I gratefully acknowledge the co-operation of En. Muhammad Murtadha Bin Othman who has assisted the various tests, references, guidance, encouragement and support in completing this project. All the regular discussion sessions that we had throughout the period of study have contributed to the completion of this project.

To En. Ismail Bin Musirin and all my friends for their help and support to complete this project.

ABSTRACT

The application of Genetic Algorithms (GA) to compute the Available transfer capability (ATC) problem is proposed in this thesis. Determination of the ATC is one of the important issues in the deregulated power system. The ATC in the power system is a measure of the maximum amount of additional MW transfer between two parts of a power system. The objective of the proposed GA is to maximize a specific point-to-point power transfer without system constraint violation in order to determine ATC through a global optimal search. The suggested of GA is simple to implement and can easily incorporate various constraint such as line limitation and voltage violation. Analytical analysis was carried out on the IEEE 9 RTS bus system. The results are compared with that obtained from the Iteration Newton Raphson power flow (INRPF).

AVAILABLE TRANSFER CAPABILITY COMPUTATION BASED ON GENETIC ALGORITHM

TABLE OF CONTENTS

<u>CONTENT</u>	<u>Page No</u>
Dedication	i
Declaration	ii
Acknowledgement	iii
Abstract	iv
Table of contents	v
List of figure	viii
List of table	ix
Symbols and Abbreviations	x
CHAPTER 1.0	
1.0 Introduction	1
1.0 Introduction	1
1.1 Objective	4
1.3 Organization of this Thesis	5
CHAPTER 2.0	
2.0 Available Transfer Capability	6
2.1 Definitions	6
2.2 ATC Principles	8
2.3 Limits to Transfer Capability	9
2.4 Commercial Components of Available Transfer Capability	10
2.4.1 Curtailability	10
2.4.2 Recallability	11
2.5 The Important of ATC	11

CHAPTER 3.0

3.0	Genetic Algorithm	12
3.1	Introduction	12
3.2	Basic Genetic Algorithm	13
3.3	Genetic Algorithm Operation	14
3.3.1	Reproduction	14
3.3.2	Crossover	15
3.3.2.1	One Point Crossover	16
3.3.2.2	Two Point Crossover	17
3.3.2.3	Uniform Crossover	18
3.3.3	Mutation	19
3.4	Genetic Algorithm Parameters	20
3.5	The Elements of Genetic Algorithm	21
3.6	The Objective and Evaluation Function	22
3.7	The Advantages of GA	23
3.8	Overview of Simple GA Structure	24

CHAPTER 4.0

4.0	Methodology	26
4.1	Introduction of Implementation of GA for ATC Computation	26
4.2	Implementation of overall project	26

CHAPTER 5.0

5.0	Result and Discussion	34
5.1	Introduction	34
5.2	Results	35
5.3	Discussion	45

CHAPTER 6.0

6.0	Conclusion	47
-----	------------	----