## ECONOMIC DISPATCH BASED ON FUEL PRICING

This thesis is presented in partial fulfillment for the award of the Bachelor of Engineering (Hons.) Electrical Universiti Teknologi MARA (UiTM)



## ACKNOWLEDGEMENT

Alhamdulillah, Thanks to Allah for the strength and blessing me throughout the entire research and completion of this thesis. Peace upon our prophet Muhammad S.A.W. who has given light to mankind.

There are numerous people I must thank that have helped me through the course of my graduate studies. I would like to express my sincere thanks to Assoc. Prof. Bibi Norasiqin Sheikh Rahimullah , my supervisor. Her motivation and encouragement kept me going throughout this thesis. Her patience and support have been invaluable towards the completion of this work. Without her constant support, this project would never have been completed.

Finally, I would like to thanks my parents, Mohd Basri bin Alwee and Normi binti Mohamed Amin for their constant support both emotionally and financially in completing this project. I sincerely appreciate their patience and understanding while waiting for me to complete my degree. Without their overwhelming positive influence on my life, I would not be able to achieve my goal.

## ABSTRACT

In economic dispatch problem, the solution is usually obtained at an average fuel price. In actual case, the fuel that being consumed by the generating unit may be affected by the pricing schemes. This paper presents a solution to solve economic dispatch problem based on fuel pricing. The solution is developed using lambda iteration method. This method is tested on a system with 2 generating units. The results obtained are compared with the economic dispatch solution without considering the fuel pricing schemes.

## **TABLE OF CONTENTS**

CONTENTS		PAGE
ACKNOWL	EDGEMENT	ĩ
ABSTRACT		ii
TABLE OF	CONTENTS	iii
LIST OF FIG	GURES	vi
LIST OF TA	BLES	vii
LIST OF SY	MBOLS AND ABBREVIATIONS	viii
CHAPTER 1	: INTRODUCTION	1
1.1	BACKGROUND	1
1.2	PROBLEM STATEMENT	3
1.3	OBJECTIVES	3
1.4	SCOPE OF STUDY	4
1.5	ORGANIZATION OF THE THESIS	4
CHAPTER 2	: LITERATURE REVIEW	5
2.1	INTRODUCTION	5
2.2	LITERATURE REVIEW	6
2.3	ECONOMIC DISPATCH	11
	2.3.1 OPERATING COST OF A THERMAL PLANT	13
	2.3.2 SOLVING ECONOMIC DISPATCH USING LAGE	RAN 16
	MULTIPLE	
	2.3.3 ECONOMIC DISPATCH WITH NEGLECTING	19
	TRANSMISSION LOSSES	

	2.3.4 ECONOMIC DISPATCH CONSIDERING	22
	TRANSMISSION LOSSES	
2.4	AUXILIARY POWER CONSUMPTION AND NET HEAT	25
	RATE	
2.5	CONSTRAINTS	26
	2.5.1 EQUALITY CONSTRAINT	26
	2.5.2 INEQUALITY CONSTRAINT	27
	2.5.3 EFFECT OF INEQUALITY CONSTRAINTS	28
2.6	MATLAB APPLICATION	28
	2.6.1 MATLAB OVERVIEW	29
	2.6.2 MATLAB SYSTEM	31
	2.6.3 APPLICATION OF MATLAB FUNCTION	33
CHAPTER	3: METHODOLOGY	37
3.1	INTRODUCTION	37
3.2	FUEL PRICING OPTIMIZATION USING LAMBDA	38
U • 20	ITERATION METHOD	20
	3.2.1 SIMULATION PROCESS	30
	JAH JIHUMAINUN INOULOD	37