

DEVELOPMENT OF WEB BASED SYSTEM LOAD FLOW (NEWTON RAPHSON) TOOLS USING WEB BASED APPLICATION

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



NURUL SYAZANA BINTI NORMAN
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR

ACKNOWLEDGEMENT

In the name of Allah S.W.T, the most graceful and the most merciful. First of all, all praise to Allah for giving me the health and strengthen to complete this final project in requirement for the award of Bachelor in Electrical Engineering.

I would like to take this opportunity to express my grateful appreciation to my supervisor, En Mohd Fuad b. Abd Latip for his guidance, advice and support in sharing his knowledge towards the completion of this final project.

Special thanks to my family, especially to my father, En. Norman B. Ismail, my mother Pn. ., my brothers and sisters for their continuous support, encouragement and mostly for their love and prays.

Last but not least, I would like to thanks to all my friend in faculty of electrical engineering and everyone who are contribute in completion of my final project. Without them, I unable to succeed.

ABSTRACT

This paper presents the development of web based power system load flow (Newton-Raphson) component using web based application. Component web based is a visual and reusable program. It is easy to maintain and also low cost. User can access the web everywhere or anywhere using internet because the program does not need to be installed. This paper present the used of PHP language in applying the Newton Raphson Method.

PHP (PHP: Hypertext Preprocessor) is a computer [scripting language](#), originally designed for producing [dynamic web pages](#). It is mainly used in [server-side scripting](#), but can be used from a [command line interface](#) or in [standalone graphical applications](#).

TABLE OF CONTENTS

	Page
Declaration	i
Acknowledgements	ii
Abstract	iii
Table of contents	iv
List of figures	vii

CHAPTER

1	INTRODUCTION	1
	1.1 Introduction	1
	1.2 Objectives	3
	1.3 Background of the project	3
	1.4 Organisation of the project	3
2	LITERITURE REVIEW	4
	2.1 Introduction	4
	2.2 Bus Classification	5
	2.3 Newton-Raphson load flow (NRLF) Method	6
	2.3.1 Calculation of Jacobian	7

CHAPTER 1

INTRODUCTION

1.1 Introduction

The load flow study reveals the electrical performance and power flow (real and reactive) for specified conditions when the system is operating under steady-state [1]. Load flow study commonly used iterative techniques for the solution of non linear algebraic equation. These technique are applied to the practical systems using the develop software modules [2].

In power engineering, the power flow study (also known as load-flow study) is an important tool involving numerical analysis applied to a power system. Unlike traditional circuit analysis, a power flow study usually uses simplified notation such as a one-line diagram and per-unit system, and focuses on various forms of AC power (ie: reactive, real, and apparent) rather than voltage and current. It analyses the power systems in normal steady-state operation. There exist a number of software implementations of power flow studies.

In addition to a power flow study itself, many software implementations perform other types of analysis [3,4].

Since computer simulation was applied to the load flow analysis, many simulation methods are proposed. However, Newton-type load flow method is the most widely used because of its quadratic convergence characteristic and sparsity technique [5].

The program for power flow solution using Newton-Raphson method has already developed by Prof. Hadi Saadat of Milwaukee University, USA in MATLAB [2]. MATLAB is an interpreted language for numerical computation. MATLAB allows its