

**LOAD FLOW STUDIES OF ELECTRICAL POWER SYSTEM  
USING NEWTON-RAPHSON METHOD**

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## **ABSTRACT**

Various method of load flow solution in electrical power system has been developed to find better load flow solution. In this thesis, Newton-Raphson method of load flow solution was used as a model for the purpose of this project. Combining it with C++ programming language, the program developed gives a description on how it is computed and further developed as a software. To view how the process is working an electrical power system model of IEEE 9 and 14-bus interconnected system were simulated using above method. The software developed in this project is capable of executing as high as 25 bus of interconnected system. A graphic user interface (GUI) was created using Borland C++ tools to allow easy manipulation of input data and easy viewing of output results. The program is later developed as an execution program to demonstrate how it is operated as actual operating software.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

An electrical power system is a network of interconnected components designed to convert non-electrical energy continuously into the electrical form; transport the electrical energy over potentially great distances; transform the electrical energy into a specific form subject to close tolerance; and convert the electrical energy into a usable non-electrical form [1].

In this project, the main objective is to show how data from line buses and transmission lines parameters are extracted and included in our load flow solution model using C++ programming language. In electrical power system, load flow analysis is important for operation planning and development. Load flow solutions are made such that they could determine the value of real power and reactive power at specified buses and losses between line connected across each bus.

These advantages are then manipulated to predict future development and expansion of the system to minimize losses and stabilizing the system if required.

In fulfilling this project objective, the main steps to be considered are:

- 1) The equation and formulation that involves in the chosen model.
- 2) The application of mathematical method when computing the model.
- 3) Computation techniques