

**DEVELOPING POWER SYSTEM ANALYSIS APPLICATION
(FAULT ANALYSIS) BY USING MAPLE**

*Project report is presented in partial fulfillment for award of Bachelor of
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ABSTRACT

In power system, the phenomenon of fault is a name given to a situation called a malfunction in the system. Most faults are the results of short circuits which include lightnings and wind of storms. Faults are the major concern in power generation, transmission and distribution since they occur frequently without warning. The classification of the transmission line faults which are bus voltage, fault and line current are very useful in monitoring and make arrangement of relays, circuit breakers and other protection and control element.

In this project, Maple programming is used to develop power system analysis application (fault analysis). The program which is develop for this project can be used to estimate the total fault current, bus voltage and line current when the input such as bus location and fault reactance are selected. The result is given for each type of fault such as balanced fault, single line to ground fault, line to line fault and double line to ground fault. Test results indicate that the Maple programming can develop power system analysis application which is accurate and significant.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Fault in a power system are the major concern for engineers working in power generation, transmission and distribution. Despite the effort to prevent faults from occur in the power system frequently. Quick action must be taken to determine the exact value of fault so that the proper action can be taken to restore the system.

The nature of a fault is simply defined as any abnormal condition, which causes a reduction in the basic insulation strength between phase conductors or between phase conductor and earth or any earthed screens surrounding the conductors.

Since 1992 and up to recently, several faulty incidents were observed and reported in some TNB distribution and transmission network in peninsular Malaysia. As a result of this situation, TNB Research Sdn. Bhd. (TNBR) in a collaborative effort with TCB Distribution Engineering and an external collaborator had initiated a research study with the prime objectives of explaining, predicting and evaluating possible preventive measures to avoid such future incidents [1].

Fault sometimes occur simultaneously at separated points on the system and on different phases. Sometimes they are accomplish by a broken conductor or may even take the form of a broken conductor without earth-connection [2]. In transmission lines, the cable presents a high level shunted capacitance per unit of length that combined with very high voltage in service, cause high reactive power absorption, thus most of the current is used to energies the cable and only small part is left over for power transmission [3].