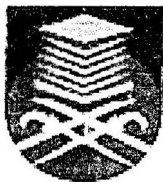


**SELECTIONS OF TRANSFORMER DIFFERENTIAL RELAY
USING FUZZY LOGIC APPLICATION**

Thesis presented in partial fulfillment for the award of the
Bachelor in Electrical Engineering (Honours)
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ABSTRACT

This final project studies the digital relay for the main protection of power transformer. This protective relay should avoid unnecessary trips according to some problems and several criteria of currents. They must block the tripping during the magnetizing inrush current and rapidly operate the tripping during internal fault current. The main objective of this study is to enhance the performance of digital relay by using a fuzzy logic application. The sensitivity and selectivity of the digital relay is analysed to overcome the problems associated with the conventional relay. The MATLAB 6.1 Fuzzy Logic Toolbox is used in order to achieve the performance of relay decision making. The results were compared with Electro-Magnetic Transient Program (EMTP) simulation and this technique is found to be of high sensitivity and speed during fault conditions.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter introduces the improvement of power system relaying according to enhance of digital technology. The conventional relay technique is analysed and enhanced their performance by the digital technique. The differential current principle is introduced and further with the technique used using fuzzy logic application.

1.1 Background of Project

Protection of large power transformer is the most challenging problem in the area of power system relaying. The conventional algorithm used in analogue relay shows the limitation of performance in protective relay. The enhancing of digital technology gives the new technique in power system relaying. Since mid-1970s, the microprocessor-based device is increasing and the power system protection devices have been based on digital technology. The development of digital protection has increased the performance of many functions for instance, as fault recording, metering, supervisory control and data acquisition (SCADA) and so on.

The differential current principle is the basis for the protection of power transformer. The function of transformer differential relay is to initiate the prompt removal of abnormal conditions from service of elements of power system.

Although this principle is primary used in power transformer protection, it has a certain limitations such as detection of the differential current does not provide clear distinction between internal fault and other conditions [1]. The following factors are considered by the protective relay i.e. transformer energisation, overexcitation, external fault and internal fault. All these factors are analysed by the protective relay to make a decision whether to trip or otherwise.