GROUND FAULT CIRCUIT INTERRPTER (GFCI)

NUISANCE TRIP REDUCTION

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UNIVERSITI TEKNOLOGI MARA (UITM)

NURHAFIZA BINTI ABD RAHMAN
FACULTY OF ELECTRICAL
ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR, MALAYSIA

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ABSTRACT

Ground fault circuit interrupter (GFCI) is used to provide protection from electrical shock and/or electrocution by monitoring current flow in a circuit. When there is any different of current return, GFCI would trip. However, some circuit containing load with producing high frequency ballast will having problem when GFCI always trip not according to the specification. By having circuit analysis and simulate it using simulation software, this problem can obtained and reduced. The main purposed of this project paper is to reduce any nuisance that may occur in GFCI. Since it involving the frequency, filter circuit would be the best solution.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Ground fault circuit interrupt (GFCI) is an inexpensive electrical device that if install could prevent electrocutions, burn and electric injuries [5]. It is used to provide protection from electrical shock by monitoring current flowing in an electrical circuit. In the United States and Canada, a residual current device is also known as a ground fault circuit interrupter (GFCI), ground fault interrupter (GFI) or an appliance leakage current interrupter (ALCI). In Australia they are sometimes known as "safety switches" or simply "RCD"(or "RCDs" for the plural) [1]. GFCI is an automatic device that offers personal protection against electrical shock [3]. GFCI also a device that detect any leakage current in an electrical circuit and turn off (trip) the circuit wherever the leakage current is greater than 5mA [2].

It is designed to protect people from electrical shock, rather than prevent damage to a building's wiring [4]. It also protect people from severe or fatal electric shock, it does not limit the magnitude of faults but it only limit the duration of fault so that the heart does not affected [5]. GFCI is very sensitive to small "leaks" of current, even the harmless one, off from the intended circuit [6]. GFCI is not design to provide protection against overload or short circuit [1].

In the United States, National Electrical Code (NEC) had required all houses in this country to install GFCI since 1973 in order to protect people from electric shock [6]. NEC requires installing GFCI for receptacles located outdoors and also in bathroom and garage [5]. NEC has required GFCI device intended to protect people to interrupt the circuit if leakage current exceeded 5mA within 25 milliseconds. The GFCI intended to operate time within 25-40 milliseconds, before electric shock can