IMPLEMENTATION OF A METHOD TO DETECT UNAUTHORIZED TAPPING OF THE SERVICE CABLE

This thesis is presented in partial fulfilment for the award of the

Bachelor of Electrical Engineering (Hons.)

UNIVERSITY TEKNOLOGI MARA (UiTM)

MOHAMED GHIBRIL BIN MD YASAN

Faculty of Electrical Engineering

UNIVERSITY TEKNOLOGI MARA

40450 SHAH ALAM SELANGOR

ACKNOWLEDGEMENT

In the name of ALLAH, The Most Generous and The Most Merciful

I would like to dedicate a special dedication to my family, my dad Md Yasan Rahmin and to my mom, Not to forget a dedication to my supervisor, Pn Pauziah Arsad for the continuous support and help.

ABSTRACT

Electricity stealing is a common thing to occur nowadays. Stealing electricity from the distribution of the electric supplier will greatly reduce their annual turnover of profits. If consumers that implement any techniques to steal electricity, they must be investigated thoroughly before any legal action can be taken upon them.

One of the commonest methods to steal electricity is to tamper with the electric reading meter. But as the time goes by, electric meter has somewhat become tamper-proof by becoming digitalized. Electrical thief will without a doubt, come up with a new way to steal electric. Identification will be difficult when all of the supply cables are invisible to the investigator. At the same time, lots of mechanism and circuitries are being deployed to prevent electricity theft being discovered.

Unauthorized Tapping Detector (UTD) will give clues whether the cable is tapped or not and where to investigate further. This paper presents an approach in recognizing illegal tapping.

This project involves the software simulation part and the experimentation of hardware assembly. This experiment utilise the comparison properties of frequency in the assembly setup before and after tapping position of cable. Results from both methods were analysed and conclusion is made based on the results.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

In the early days of commercial use of electric power, transmission of electric power at the same voltage as used by lighting and mechanical loads restricted the distance between generating plant and consumers. Originally generation was with direct current, which could not easily be increased in voltage for long-distance transmission. Different classes of loads, for example, lighting, fixed motors, and traction (railway) systems, required different voltages and so used different generators and circuits.[1]

The generation, transmission and loads all needed to be of the same voltage because, at the time, there was not a common way of doing DC voltage conversion (other than motor-generator sets which today have became super efficient). The voltages usually had to be fairly low with old generation systems due to the difficulty and danger of distributing high voltages to small loads. The losses in a line transmission cable are proportional to the square of the current, the length of the cable, and the resistive nature of the conductor line wire material, and are inversely proportional to cross-sectional area.

Early power transmission networks were already using copper, which is one of the best conductors that is also very economically feasible for this application. To reduce the current while keeping power transmission constant requires increasing the voltage which, as previously mentioned, was, at that time, problematic. This meant in order to keep losses to a reasonable level the (DC) Edison power transmission system needed thick cables and local power generators.[2]

Soon, the adoption of alternating current (AC) for electricity generation dramatically changed the situation. Power transformers, installed at power substations, could be used to raise the voltage from the generators and reduce it to supply loads. Increasing the voltage reduced the current in the power transmission and distribution lines. Thus