# COMPENSATING CAPACITOR PLACEMENT FOR VOLTAGE STABILITY IMPROVEMENT AND LOSS MINIMIZATION

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# ABSTRACT

This project discuss on voltage improvement for low voltage distribution system using compensating capacitor method. This method allocates capacitors to certain nodes which are selected by first identifying the branch which has the largest losses. A study is carried out on of a portion of Tenaga Nasional Berhad (TNB) Klang low voltage system. Selection of the area is based on the one that experience voltage drop beyond the tolerable margin. This method is applied to a 42 bus (nodes) low voltage distribution system of 415 V line voltage and 300 kVA of Kampung Perepat Baru, Kapar. This thesis also uses the Distflow load flow technique to compute power flow and voltage profile for radial distribution system.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Introduction

The electrical energy is generated at the generating stations by dynamos and is distributed at appropriate voltage, which is kept constant. The element of good service to a customer includes continuity of service, proper voltage and correct frequency. Good service continuity requires a system where interruption of service is rare and is limited to the smallest practical number of consumers. Proper voltage requires that the voltage remains within a range established by an industry standard and momentary changes in load do not cause objectionable light flicker.

Voltage stability problems are not new to the electric utility industry or commercial area. Since voltage instability has been responsible for several major network collapses, many techniques have been developed to identify critical power system, buses and lines. T. K. Abdul Rahman and Jasmon developed a new technique to determine the static voltage stability of load buses in a power system for a certain operating condition and hence identify load buses that are close to voltage collapse. It is also present a new technique to compute power flow solution for radial network [1]. Kashem and Mahmoud studied the relationship between voltage stability and loss minimization in which it can be shown that voltage stability is maximized when power losses are minimized in the network [2].