NETWORK RECONFIGURATION FOR LOSS MINIMIZATION AND VOLTAGE STABILITY IMPROVEMENT

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MOHAMAD HAMID GADAFI BIN DANAN
FACULTY OF ELECTRICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR, MALAYSIA.

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ABSTRACT

Distribution system through network reconfiguration is realized to be operated under minimized loss condition due to a large consumption in power energy nowadays. This report presents a technique for networks reconfiguration that aims to improve voltage stability and hence minimized the loss. By presenting the relationship between voltage stability and loss minimization it can be shown that voltage stability is maximized when power losses are minimized in the network. The performance of the techniques is tested using 33 buses IEEE Reliability Test System. This report also presents a development of a load flow programming to compute power flow and voltage profile for radial network called Distflow using "C" programming language. Test results indicate that improvement in voltage stability will result in loss minimization and also voltage improvement.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

An electrical power is a network of interconnected components designed to convert non-electrical energy continuously into the electrical form, transport the electrical energy over potentially great distances, transform the electrical energy into a specific form subject to close tolerance and convert the electrical energy into a usable non-electrical from [1].

Planning the operation, improvement and expansion of a power system requires load studies, fault calculations, the design of means of protecting the systems against lightning and switching surges and against short circuit and study of the stability of the system [2]. In the future, power system engineers will be forced to place more emphasis on reducing losses at the distribution level.

In an electrical power system, load flow analysis is important for operation planning and development the future expansion to keep pace with the load growth. Such studies help in ascertaining the effects of new loads, new generating station, new lines and new connections before those equipment installed and determine the value of real power and reactive power at specified buses and losses between lines connected across each bus. The prior information serves to minimize the system losses and stabilizing the system if required.