

**THE DISTRIBUTION NETWORK VOLTAGE IN THE PRESENCE
OF DISTRIBUTED GENERATION**

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ABSTRACT

This paper presents voltage stability studies in the presence of distributed generation. In this study, the voltage study analysis in transient mode will be performed with and without the presence of distributed generator. The effect of distribution generator will also be investigated. Several simulation models will be developed for the implementation of the study. A simple test system will be utilized for this study.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

New technologies involving the use of conventional fossil fuel such as fuel cells and micro-turbines have offered the new prospect with significant reduction in pollution emissions namely Distributed Generation (DG). Besides, modularity, power loss reduction, improving the voltage stability, deferring the transmission and distribution investments represents some of the advantages of this device. Thus, numerous steps are taken in order to explore new research concerning DG in electricity network. DG is an electricity generation sites close to the load location. Hence, the utilization of DG sources offers a number of technical, environmental and economical benefits for utilities and consumers due to their close location with the customer [1, 2]. Popular examples of DG are the micro-turbines or fuel cells [3]. These DGs are dynamic devices and when they are connected to the distribution system, this will affect its dynamics behavior [4]-[6].

Voltage regulation is one of the main problems in the distribution systems, especially at the much far-end load and in the rural areas. The issues of voltage regulations and maintaining the voltage level are well known problems in the radial distribution network. Several techniques can be applied to solve the problems such as implementation of many devices in the distribution network. The most common devices and techniques use are transformer equipped by load tap changer, supplementary line regulators installed on distribution feeders, shunt capacitor switched on distribution feeder [7] and shifting transformers toward the load center [8].