TRANSMISSION LINE COMPENSATION FOR POWER SYSTEM STABILITY IMPROVEMENT

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ABSTRACT

This paper presents the transmission line compensation to improve the system stability in powersystem. In order to achieve the objective, three methods of line compensation were implemented, series capacitor, shunt capacitor and shunt reactor to improve the voltage stability by looking at the voltage regulation.The location of weekest transmission line was identified using the sensitivity index (SI). The proposed method was applied to a 30 busbar IEEE systems to show its feasibility and capability. All simulation was done using the MATLAB version 7.5 programming.

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CHAPTER 1

INTRODUCTION

1.0 BACKGROUND

The purpose of an electrical power system is to generate and supply electrical energy to consumers. Generating station, transmission line and the distribution system are the main components of an electric power system. Generating stations and a distribution system are connected through transmission lines, which are also connected to one power system (grid, area) to another [1].

Voltage stability is the ability of a power system to maintain acceptable voltage at all buses in the system under normal conditions and after being subjected to a disturbance. The voltage stability in electric power systems is relatively a new problem. A system enters a state of voltage instability when a disturbance causes a progressive and uncontrollable decline in voltage. Voltage stability phenomena can be divided into transient voltage stability and long-term voltage stability. Transient voltage stability involves the dynamics of equipment such as induction motors. Longterm voltage stability involves the dynamics of equipment such as LTC transformers, thermostatically controlled loads, and generator excitation limiters.[14]

Several different approaches have been proposed for analysing the voltage stability problem. Majority of the work addressed in literature are from a static viewpoint. Static techniques are based on power flow formulation.