# UNDERVOLTAGE LOAD SHEDDING TO AVOID VOLTAGE INSTABILITY

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## ABSTRACT

This thesis presents a comparative measurement for undervoltage load shedding in power system. The technique for comparing the voltage profile for the particular bus is developed by using the simulink. The voltage profiles for this condition: initial condition, some loads are shed; some generators are turned off, at stressed condition, and also in the event of line outage condition; are observed. From the observation, the condition of voltage level can be determined.

Result shown that when the load shedding is applied, the voltage profile at any particular bus is better. This can avoid the voltage instability for the system that can lead to the event of voltage collapse.

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# CHAPTER 1

# INTRODUCTION

## 1.1 Background

Voltage stability study is an important issue in power system environment as the occurrence of voltage instability could cause high transmission loss as well as monetary loss. It is one of the major problems that affect the smoothness of the transmission process. There is a tendency that power transmission systems of today are operating closer and closer to theirs limits [1]. As mentioned in [2], this is due to the steady increment of electricity demand and the increasing practice of long distance bulk power transmission has led in front of the new power system infrastructure construction. With the limiting factors of these transmission systems, it is common that the voltage of the system will be unstable. Voltage instability can be caused by stressed condition at a particular load (PQ) bus. This refers to heavy reactive loading at a bus. As the reactive power loading increases, the voltage profile also reduces accordingly until a point where a load flow fails to converge. At this point, instability condition is likely to occur leading to voltage collapse to the whole system. Total transmission losses in the system will increase accordingly as the reactive power loading at a particular load bus increases. A number of researches have been carried out to find the way of avoiding voltage instability. The previous data have shown that not less than 15 voltage instability incidents occurred worldwide during 1970s and 1980s [3]. Voltage instability can lead to the event of approaching blackout [4]. In this condition, it is hard to ensure voltage stability and reacceleration of motors by reactive power compensation alone. Stated in [5], dynamic voltage collapse can be predicted using Power Transfer Stability Index (PTSI). But in this study, it is more likely to prevent the voltage occurrence.