COMPUTATIONAL INTELLIGENCE BASED TECHNIQUE FOR LOAD SHEDDING SCHEME

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ABSTRACT

Losses in generation and overloading effect are two phenomena that may occur due to progressing demand at the load side. This may lead to system instability in the forms of voltage and frequency. In order to avoid this problem, the under voltage load shedding scheme can be performed to shed some amount of load in order to avoid blackout. This paper presents computational intelligence technique for load shedding. The study involves the development of fuzzy rules in order to make decision on load shedding. It will determine the amount of load that needs to be shed depending on the measured minimum voltage of the system. The result of this study will show the performance of under voltage load shedding scheme in determining power system stability by shedding some amount of the load demand. The technique has been validated on the IEEE 30-bus system.

Index Terms—voltage collapse, system stability, fuzzy logic, under voltage load shedding

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CHAPTER 1.0

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In power system operation, the balance between load demand and the available generation is important to make sure the stability of the system is in good condition [1]. Nowadays, there are many situation occur where the demand load have reached the limit of an available generation in certain place. When this condition occurs, there will be the same situation as in 2005 where there was power outage in Malaysia where many states in northern part of peninsular Malaysia, including Perlis, Perak, Penang and Kedah due to the fault occurrence. This situation happened due to the load demand used by the user has exceed the limit that the available generation can support. From this situation a load shedding scheme is initiated to avoid the system from collapse [2]. There are many factories that have taken improvement step to prevent this phenomena happening again by developing a new alternative extensively to ensure the power system network operates in the normal steady state condition conveniently [3].

In [4], the thesis state that when disturbance occurs, increase in load demand, or change in system condition causes a progressive and uncontrollable drop in voltage, the system will become unstable. The main factor for this situation is the inability of the power system to meet the demand of increased reactive power. Literally, it will cause the system collapse.