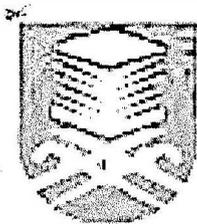


**TRANSMISSION RELIABILITY MARGIN (TRM) IN A
DEREGULATED POWER SYSTEM**

This thesis presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons)
Of
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ABSTRACT

In bulk electric power transfer capability computations, the transmission reliability margin (TRM) account for uncertainties related to the transmission system conditions, especially during the line outages with various loading conditions. Bulk power transfers in electric power systems are limited by transmission network security. Transfer capability measures the maximum power transfer permissible under certain assumptions. Once a transfer capability has been computed for one set of assumptions, it is useful to quickly estimate the effect on the transfer capability of modifying those assumptions. This paper presents a computationally efficient formula for the first order sensitivity of the transfer capability with respect to the variation of any parameters. The sensitivity formula very fast to evaluate. The approach is consistent with the current industrial practice of using DC load flow models and significantly generalizes that practice to more detailed AC power system models that include voltage and VAR limits. The computation is illustrated and tested on a 9 bus power system. The software will used MATLAB programming. The purposed method in determining the TRM is mainly based on the first order method, which contributes best accurate and secure transfer capability calculations.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Bulk power transfer capability computations have many uses in electric power system operation and planning. In the operation of bilateral markets, available transfer capability is used to allocate reservations of transmission right [1]. In the operation of pooled markets, transfer capabilities combined with propose information can be used to help allocate financial transmission congestion contracts. In the both planning and operations, transmission capability can be used to evaluate power system security when local power sources are replaced by imported power. Finally, transfer capability can be used to provide capacity data for simplified power system models suitable for location price forecasting. In many of these applications, it is desirable to quantify the uncertainty in the transfer capability computation as a safety margin so that if the computed transfer capability minus safety margin is used, it is likely that the power system will remain secure despite the uncertainty. Transmission reliability margin (TRM) is the safety margin that measures the system parameters uncertainty which considered in the transfer capability computation. Deregulation of power system has increased the need for defensible calculation of transfer capability and related quantities such as the (TRM). The reliability margin (TRM) is defined as the amount of transmission transfer capability necessary to provide a reasonable level of assurance that the interconnected transmission network will be secure. These theses