ABSOLUTE AND REVERSE MW-MILE METHODS FOR COST ALLOCATION IN A DEREGULATED POWER SYSTEM

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ABSTRACT

This paper introduces a methodology to allocate the costs among users in the power system by referring to the topological analysis of power flows in the transmission line. The methodology in cost allocation uses two types of MW-MILE method which are absolute and reverse approaches. Absolute MW-Mile approach cost is allocated in proportion to the ratio of apparent power flow and the line rating which ignores the direction of the power flow. Whereas, the Reverse MW-Mile approach cost is allocated in proportion to the ratio of reverse power flow and the line rating. The methods are capable to determine the network usage by any load and/or generator by cumulating all the allocated cost with respect to the load and/or generator bus. The cost allocation is analyzed by taking into account the existent conditions of a given electric network and also during the effect of power transfer between areas. A case study of IEEE RTS for 9 bus, 24 bus, 57 bus and 118 bus is carried to evaluate the effectiveness of the MW-Mile methods in allocating the cost for each user or bus.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The deregulation of the power industry developed worldwide has originated a rich discussion about the best way to manage, economically and technically, the different markets and situations developed with deregulation. Without any doubt, the deregulation process has faced difficulties, successes and failures, with many problematic areas still being explored and developed. One of the most complicated issues is the cost allocation among the different markets agents utilizing those networks [1]. Unbundling the transmission service is probably the most complicated and difficult which causes the cost allocation as the highly integrated electrical business. Accurate cost allocation is vital for the proper operation of the deregulation industry [2]. Therefore, the transmission system is important in the deregulated markets, as facilitator of generator competition, allowing generators to allocate their production in consumer centers and allowing consumer to benefit from that competitive environment.

A method used in allocating the cost is the MW-Mile method. Inherently, the MW-Mile method is concerned with treating transmission as a separate business of transporting energy from any generator to any area of consumers, while maintaining system integrity. Whereby, the MW-Mile method is used to allocate charges among users of a transmission system. Conceptually, the MW-Mile methodology is expressed, by a product of power due to a particular transaction in the network. This approach, although based on intuitive rather than theoretical basis, has gained a lot of support as it promotes the maximum use of the existing system and is stable [3]. The analysis proposed two methods of MW-Mile in determining the cost, namely as the absolute