

Thesis Title	Transmission cost allocation based on tracing of electricity considering reliability criteria
Author	Mr. Wasan Padungwech
Degree	Master of Engineering
Faculty	Faculty of Engineering
Thesis Advisor	Asst. Prof. Dr. Nopporn Leeprechanon
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ABSTRACT

The settlement of transmission service rate in compliance with the principle of transmission cost allocation has been developed in various methods for fair, clearness, simple and reliable consideration. The transmission cost allocation methods proposed in this thesis consider 2 major conditions – normal and emergency. However, most recent proposed methods are determined to assign the cost allocation to either the generators or the distributors (loads). Moreover, all previous publications contributed to the mathematical models to determine the reserved capacity ratio in emergency conditions. Based on the hypothesis that each transmission line has only one circuit, which is different from the real systems. Those publications also focus mostly on the active power without the consideration on the inclusion of reactive power in one single model. Consequently, the results of the cost allocation may not reflect the transmission efficiency, usage behavior and reliability benefit. This thesis, therefore proposes the cost allocation method for both generator's and distributor's side by adopting Bialek's tracing method considering reliability criteria which include the calculating of reactive power into the proposed model. Since there is no any application software for the determination of the results, researcher has invented the new application software and tested the efficiency of both recommended method and software with the 6 bus test transmission system and the transmission system on Northern region of the Electricity Generating Authority of Thailand (EGAT). The test results revealed that the recommended method was able to provide the transmission business the income covering the entire embedded cost. Service rate properly reflected the efficiency and

the demand on transmission expansion. This could be appropriate approach for the users to select the location of power plant construction or load connection. Besides, it also reflected the usage behavior of transmission system.