

Sarawut Paspantong 2014: Power Generation Allocation Considering System Congestion in Mixed Electricity Markets with Pool and Bilateral/Multilateral Contracts using Group Curtailment Bids. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Parnjit Damrongkulkamjorn, Ph.D. 86 pages.

This thesis proposes the study of congestion management in energy transactions with bilateral and multilateral contracts in electricity market. The bilateral transactions include the firm bilateral and nonfirm bilateral contracts. The study applies the concept of optimal power flow in order to optimally dispatch power generations. When there are transmission congestions in the system resulting in the shortage of power generation in bilateral or multilateral contracts, the independent system operator (ISO) uses the non-curtailment bids for bilateral contracts and group curtailment bids for multilateral contracts to curtail the contract. The participants in multilateral contracts must offer higher bids than the participants in the firm bilateral contracts in order to receive the full amount of power generation on the contract. If the contract is curtailed, the shortage power generation is compensated by the purchase from the pool. Therefore the demand at each and every bus in the system is satisfied without being shed.

The algorithm is written in MATLAB in order to illustrate the study of bilateral and multilateral transactions of the modified IEEE 14 bus system.

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Thesis Advisor's signature