Jaturawit Busara 2011: Transmission Congestion Management in Hybrid Electricity Market using Noncurtailment Bids. Master of Engineering (Electrical Engineering), Major Field: Electrical Engineering, Department of Electrical Engineering. Thesis Advisor: Assistant Professor Parnjit Damrongkulkamjorn, Ph.D. 79 pages.

This thesis proposes the study of congestion management in electricity market with bilateral contracts considering both firm and nonfirm bilateral contracts. The study applies the optimal power flow (OPF) to determine the optimal generation dispatched from each generator, power flow in transmission lines, magnitude and angle bus voltages, and nodal prices. When transmission congestion occurs due to bilateral contracts, the Independent System Operator (ISO) determines the contract curtailment based on the noncurtailment bids in $/MW offered by the participants of firm and nonfirm bilateral contracts. The noncurtailment bids offered by firm contracts are much higher than those offered by nonfirm contracts. The curtailed amount is reciprocal to the noncurtailment bids offered by the contracts. The curtailed amount from the contract is compensated by power generated from other generators in pool. In this research, it is assumed that there is no load shedding required.

The proposed algorithm is programmed in MATLAB and tested with a modified IEEE 14 bus system.

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