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## NETWORK CONSTRAINED EVALUATION OF OPTIMAL BILATERAL REAL POWER TRANSACTIONS AND REAL POWER GENERATION LEVELS

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## Abstract

Under a deregulated environment, electricity consumers and suppliers generally establish various bilateral power transactions/contracts. The transmission company normally honors and executes these bilateral contracts as far as the system design and operating conditions permit. This paper describes determination of optimal bilateral contracts by using Line Flow Factors (LFFs). The line flow constraints are accounted for as a maiden attempt in determination of optimal bilateral transactions by expressing line flows in terms of active power contracts using line flow factors. An innovative approach for obtaining the set of line flow factors for line flows and the LFFs are elegantly evaluated from existing load flow information. A generalized linear programming formulation is then proposed to solve system operation under a deregulated environment subjected to the steady-state security constraints (e.g. generation and line flow limits). Examples are presented to illustrate the use of the proposed formulation to minimize the cost of any bilateral contract to comply with the security requirements. It was concluded that the proposed methodology would be an effective tool to study the intricate relationships between the bilateral contracts and system security.

Keywords: generation, line flow factors, deregulation and security.