

VOLTAGE STABILITY BASED AVAILABLE TRANSFER CAPABILITY ENHANCEMENT IN COMPETITIVE ELECTRICITY MARKET USING UPFC

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ABSTRACT

Voltage instability has been considered as a major threat to power researchers and utilities for more than three decades. In competitive electricity market, a number of generating companies may use same transmission corridor to supply power to consumers. This may reduce Available Transfer Capability (ATC) of transmission network. ATC reduction may lead to shrinkage of nose curve, thus causing the danger of voltage instability. In this paper, determination of ATC has been proposed based on voltage stability criterion for bilateral and multilateral contracts. Placement of Unified Power Flow Controller (UPFC) in optimal location has been suggested for voltage stability based ATC enhancement. Optimal location of UPFC has been found using a sensitivity based approach. Case studies performed on IEEE 14-bus system establish the effectiveness of UPFC placement in voltage stability based ATC enhancement.

KEYWORDS: Voltage Stability, Available Transfer Capability, Loading Margin, Unified Power Flow Controller