A NOVEL METHOD FOR ATC COMPUTATIONS IN A LARGE-SCALE POWER SYSTEM

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Abstract

In a restructured power system, it is the responsibility of the independent system operator (ISO) to control the power transactions and avoid overloading of the transmission lines beyond their thermal loading megavolt-ampere (MVA) limits. For this, ISO has to update periodically a real-time index termed available transfer capability (ATC). The methods reported to date for ATC determination are unable to cater to either the accuracy or the online CPU time requirements when the system is a large one. This paper proposes a novel method with the full details for determining ATC in a large power system from only three input variables through fuzzy modeling. The method is validated through extensive simulation tests on the standard IEEE 24-bus reliability test system (RTS), and comparison with an ac load flow-based conventional method using the same array of transactions, base cases, and generation/line outages.