

Optimal Location of Unified Power Flow Controller (UPFC) for Transient Stability: Improvement Using Genetic Algorithm (GA)

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Abstract : As the power demand rapidly increases, the generation and transmission systems are affected because of inadequate resources, environmental restrictions and other losses. The role of transient stability control in maintaining the steady-state operation in the occurrence of large disturbance and fault is to describe the ability of the power system to survive serious contingency in time. The application of a Unified power flow controller (UPFC) plays a vital role in controlling the active and reactive power flows in a transmission line. In this research, a genetic algorithm (GA) method is applied to determine the optimal location of the UPFC device in a power system network for the enhancement of the power-system Transient Stability. Optimal location of UPFC has Significantly Improved the transient stability, the damping oscillation and reduced the peak over shoot. The GA optimization Technique proposed was iteratively searches the optimal location of UPFC and maintains the unusual bus voltages within the satisfy limits. The result indicated that transient stability is improved and achieved the faster steady state. Simulations were performed on the IEEE 14 Bus test systems using the MATLAB/Simulink platform.

Keywords : UPFC, transient stability, GA, IEEE, MATLAB and SIMULINK

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