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Title: Power Flow Control using Fuzzy Based UPFC under different operating conditions

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Abstract:

Now a days power system network operates at different states due to variation in load demand. As a result, the power flow in transmission line keeps on changing which needs to be controlled precisely. Therefore, in this paper an attempt to control power flow in transmission line at various operating states of power system network using Unified power flow controller (UPFC) is considered. Fuzzy logic controller (FLC) has been employed to provide dynamic control of series and shunt converters of UPFC because it adapts wide range of dynamic changes of power system operations easily. The performance of the FLC based UPFC to control power flow under three operating states (nominal loading, variable loading and different referencing of power) of IEEE-14 bus system has been observed in PSCAD environment. The results show that FLC based UPFC is capable of controlling power flow in transmission line in whatever states the power system network is operating. In addition, to validate the statement that FLC based UPFC cope up with networks variation flexibly, the simulation results are compared with proportional integral (PI) based UPFC. The results show that the FLC based UPFC has better power flow capability compared to PI controller.