Title:	Stabilization Control of Power System with Large-Scale Wind Farm by Using DFIG Considering Grid Codes
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Abstract:

This paper proposes an innovative operational scheme for a grid-connected large-scale wind farm (WF) which is composed of both fixed speed wind turbines with squirrel cage induction generators (FSWT-SCIGs) and variable speed wind turbine with doubly fed induction generators (VSWT-DFIGs). Normally, SCIG cannot fulfil the necessities of fault ride-through (FRT), because of the insufficient amount of reactive power supply during transient condition which may leads to the instability of the power system. Thus, in this paper, a new technique is proposed to stabilize SCIG by using DFIG in a grid-connected WF. A novel fuzzy logic controller (FLC) based rotor side controller is proposed for VSWT-DFIG to improve the FRT capability of FSWT-SCIG-based WF and transient stability of entire power system. The proposed FLC is designed in order to inject effective amount of reactive power during fault condition. The effectiveness of the proposed control strategy is verified through simulation analyses on a multi-machine power system model in PSCAD/EMTDC software. Additionally, the transient stability of the entire power system is evaluated by using the transient stability index.