Title:	A Robust Control Strategy to Improve Low Voltage Ride-Through of a Grid-Connected Photovoltaic System
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Abstract:

In this paper, a robust control approach is developed to enhance the transient stability and low-voltage ride-through (LVRT) competence of a grid-connected large-scale solar photovoltaic (PV) plant. The modern grid codes are demanded that the PV plant should provide dynamic support. The proposed control policy can guarantee the LVRT aptitude in accordance with grid codes and power system transient stability against symmetrical and unsymmetrical faults. Besides, a DC-link protection system, AC–DC converter, and DC– AC converter controllers are developed. To analyse the performance of the proposed strategy under different faults, simulation is performed on a customized IEEE nine-bus system including conventional synchronous generator (SG)-based power plants and a PV plant using PSCAD/EMTDC software. Additionally, a comparative study is shown with the conventional control strategy. The simulation analysis shows that PV plant terminal voltage is recovered 90% of its nominal value within 1.5 s, which implies that the LVRT aptitude and transient stability can be enhanced by integrating the proposed strategy.

Key Words: PV system, AC–DC converter, DC–AC converter, power system, transient stability