

## The Stability Study of Large-Scale Grid-Tied Photovoltaic System Containing Different Types of Inverter

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**Abstract :** Power generated by large-scale photovoltaic plants (LSPVPs) is usually transmitted to the grid through several transformers and long distance overhead lines. Impedance of transformers and transmission lines results in complex interactions between the plant and the grid and among different inverters. In accordance with the topological structure of LSPV in reality, an equivalent model containing different inverters was built and then interactions between the plant and the grid and among different inverters were studied. Based on the vector composition principle of voltage at the point of common coupling (PCC), the mathematic function of PCC voltage in regard to the total power and grid impedance was deduced, from which the uttermost total power to guarantee the system stable is obtained. Taking the influence of different inverters numbers and the length of transmission lines to the system stability into account, the stability criterion of LSPV containing different inverters was derived. The result of simulation validated the theory analysis in the paper.

**Keywords :** LSPVPs, stability analysis, grid impedance, different types of inverter, PCC voltage

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