عنوان مقاله:

An Effective Damping Control Approach in Grid-Connected Converters

محل انتشار:

مجله الکترونیک صنعتی ،کنترل و بهینه سازی, دوره 6, شماره 4 (سال: 1402)

تعداد صفحات اصل مقاله: 12

نویسندگان:

Anwer Ali - *SMGRC, Dep. of Electrical Eng., University of Kurdistan, Sanandaj, Iran*

Sirwan Shazdeh - *SMGRC, Dep. of Electrical Eng., University of Kurdistan, Sanandaj, Iran*

.Hassan Bevrani - *SMGRC, Dep. of Electrical Eng., University of Kurdistan, Sanandaj, Iran*

Rahmatollah Mirzaei - *Dept. of Electrical Engineering, University of Kurdistan, Iran*

Qobad Shafiee - *Dept. of Electrical & Computer Engineering, University of Kurdistan, Sanandaj, Kurdistan, Iran*

خلاصه مقاله:

The primary objective of this paper is to address the adverse effects of active power fluctuations on grid-connected converters. One of the challenges in integrating high levels of solar photovoltaic power into the utility grid is the lack of inertia from converter-based resources. This paper proposes a solution to this challenge by synthesizing additional inertia and damping properties using power electronics converters. They emulate the inertia and damping properties of synchronous generators. The paper discusses different approaches to achieving effective damping control in grid-connected converters. It proposes a genetic algorithm optimization tool to optimize virtual damping and inertia parameters. The goal is to suppress oscillations and ensure stable grid operation. The proposed method is evaluated in both time-domain and frequency-domain analyses. The simulation results demonstrate the validity of the optimization technique and implementation procedure. Using virtual inertia and damping properties ensures stable grid operation and improves the integration of solar photovoltaic power into the utility grid. The paper provides a detailed discussion of the approach, optimization tool, and simulation results, highlighting the effectiveness of the .proposed method

کلمات کلیدی:

grid connected converters, virtual synchronous generator, swing equation, damping control