

Microgrid distortion-free current limiting

Can Superconducting fault current limiter improve power quality in microgrids?

This research paper presents a new approach to address power quality concerns in microgrids (MGs) by employing a superconducting fault current limiter (SFCL) and a fuzzy-based inverter.

How do distributed generators contribute to microgrid fault currents?

In the event of a fault, distributed generators (DGs) contribute differently to microgrid fault currents depending on the DG type, which can be synchronous-based or inverter-interfaced. For inverter-interfaced DGs (IIDGs), an inverter serves as an interface medium between the RESs and micro-grid.

How to limit iidg fault currents?

An alternative and feasible solution to limit the IIDG fault currents is the use of VI-FCLs. Controlling the IIDG as a voltage source behind a virtual impedance during faults protects the inverter switches from overcurrent or thermal damage and ensures the stable and reliable operation of islanded microgrids.

How do droop-based iidgs in Islanded microgrids work?

Droop-based IIDGs in islanded microgrids switch to current sources under faulty conditions, which could ruin protection coordination and microgrid stability. VI-FCLs are implemented within the IIDG control scheme to keep the IIDG voltage model intact. An SCC algorithm that accommodates VI-FCLs is proposed.

Does a two-phase and three-phase dip in grid voltage limit inverter current?

The results under two-phase and three-phase dip in the grid voltage shows that the proposed control strategy injects maximum reactive and active power and limits the inverter current by quickly activating the APC control loop during fault-ride-through period.

What are the effects of nonlinear loads on microgrids impedance?

Voltage distortion, a poor power factor (PF), and stress on supply power system equipment are all caused by harmonics in these non-linear loads. Harmonics from non-sinusoidal loads has an impact on the electrical microgrids impedance.

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In [17], using average and second harmonic components of real and reactive powers, grid-connected inverter current references are generated in SYRF to limit the fault current. ...

Hence, in order to protect microgrid, there are two problem which should be solved: (i) how to limit the output current of DGs into a stable value; (ii) how to maintain the power quality when the current-limiting strategy ...

A circular current limit on $I_{dq} * pcc$, as shown in (5) is an ideal choice as it precisely limits current and preserves the angle of the injected current and thus limiting the ...

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Control of a Multiple Source Microgrid With Built-in Islanding Detection and Current Limiting Jeffrey M. Bloemink, Student Member, IEEE, and M. Reza Iravani, Fellow, IEEE Abstract--An ...

In order to protect the power electronic equipment and make the output current amplitude of distributed generation (DG) maintain a stable value for different short-circuit faults, this paper ...

Development of an efficient protection strategy is one of the main barriers in paving the way for the implementation of inverter-based microgrids. The limited fault current of voltage-sourced ...

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Inverter current limiting in islanded networks during unbalanced faults can cause voltage distortion. By using the control system to emulate a parallel impedance, this distortion can be avoided ...

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