Solar Energy South Africa

High Voltage Ride Through for Energy Storage Systems

Overview

Does DC link voltage rise during grid high-voltage ride-through (HVRT)?

During grid high-voltage ride-through (HVRT), a wind turbine (WT) with fully-rated converter (FRC) would experience an overvoltage at the DC link, which can threaten the safety of the DC link capacitors and the connected power modules. This paper investigates the process of the DC link voltage rise.

How to reduce grid overvoltage during HVRT?

Due to the isolation of the DC link, the turbine generator and the MSC could not detect the grid overvoltage directly. It is the DC link that would experience a serious overvoltage during HVRT. Some HVRT strategies propose reactive compensation devices, e.g., SVG and STATCOM, to decrease the grid overvoltage by absorbing reactive power , .

How safe is the power grid with large-scale wind power?

So, the safe and stable operation of the power grid with large-scale wind power faces significant challenges [2, 3]. The generator with full power converter (FPC) and doubly fed induction generator (DFIG) with partial power converter are two promising wind turbines in the wind power industry.

How to improve LVRT capability of hybrid energy system?

Literature proposed an FLC scheme to accomplish a better FRT capability of the hybrid energy system. Literature and proposed an FLC, which brings sufficient coordination between the dc-link voltage and battery energy storage systems (BESS) control to improve the LVRT capability of the DFIG system.

What is DC-bus voltage control strategy?

Literature proposed a flexible and variable dc-bus voltage control strategy, which reduces the power loss of power converter during faults and improves the efficiency of the DFIG systems. Literature proposed the asymmetrical HVRT control for the DFIG system.

What is DC-link overvoltage?

The DC-link overvoltage results in high mechanical and electrical stress for the back-to-back converters, which may endanger the secure operation of the wind turbine. Thus, the wind turbine should initiate a controlled voltage drop for mitigating DC-link overvoltage.

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Low-Voltage Ride-Through Control Strategy for a Grid-Connected Energy ...

This paper presents a low-voltage ride-through (LVRT) control strategy for grid-connected energy storage systems (ESSs). In the past, researchers have investigated the LVRT control ...

Study on high voltage ride through control strategy ...

Regarding PMSG-based wind turbine generation system, this study proposes a super-capacitor energy storage unit (SCECU) connected parallel to the DC-link of the back-to-back converter to enhance its high ...

Low-voltage ride-through control strategy for ...

When the grid voltage is unbalanced, it causes a secondary ripple in the DC bus voltage. 36 The secondary ripple appears in the reference current of the energy storage device after PI regulation, so the energy storage device current also ...

Fault ride-through control strategy of H-bridge cascaded energy storage

of the energy storage system and threaten stable operation. This article takes the improvement of the fault ride-through capability of the cascaded energy storage system as the starting point, ...

Low-voltage ride-through control strategy for flywheel energy storage

access to "new energy+energy storage" systems, includ-ing requirements for power regulation and low-voltage ride-through (LVRT) capabilities. LVRT presents signifi-cant issues for ...

MPC-based DC-link voltage control for enhanced high-voltage ride ...

35 atility of offshore wind energy have brought challenges to the secure operation of power systems, e.g., the voltage stability of 36 power systems [3]-[6]. Extensive efforts have been ...

Comprehensive review on low voltage ride through ...

The high penetration of grid connected wind energy has emerged as a recent trend in many countries. On the other hand, the problem of power generation loss due to the grid fault also arisen. The recent technological advancement ...

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