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The application of distributed renewable energy (DER) drives the development of DC microgrid based on voltage source converter (VSC). And short circuit fault protection is a significant challenge ...

standard for DC short-circuits characterization, the source of DC short-circuit current can be from rectifier, battery, bus-capacitor and DC motor with independent excitation. The characterization of DC short circuit currents from these sources using IEC 61660-1 has been discussed in the literature [4,7]. The effectiveness of this standard in

In this paper, a ring-type wind turbine-based DC microgrid is taken as the object of study and the transient characteristics of VSC as well as the system under DC line fault are ...

Inverter-based resources (IBR"s) and converter-based resources (CBR"s) are commonly used in DC microgrid applications resulting in highly capacitive networks. Faults can ...

In case of a DC short-circuit fault, the IGBTs are immediately blocked for self-protection, whereas reverse diodes are exposed to overcurrent. Meanwhile, the charged filter ...

Under a short-circuit fault in low-voltage dc microgrid, solid-state circuit breaker (SSCB) assumes the responsibility of the quick and effective isolation of the faulted area, while its own ...

On the other hand, in a hybrid microgrid, both DC and AC power distribution is used to avoid losses caused by the conversion of power from DC to AC for AC appliances and again from AC to DC for DC ...

DOI: 10.1109/PowerCon58120.2023.10331367 Corpus ID: 265863485; Characteristics Analysis of Short-Circuit and Ground Fault in Photovoltaic Storage and Charging Integrated DC Microgrid

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Bidirectional Short-Circuit Current Blocker for DC Microgrid Based on Solid-State Circuit Breaker ... together with the fact that the rotational inertia of a DC microgrid is small and short ...

Proper short-circuit protection in dc microgrids has provided a sturdy challenge to researchers as the

development of commercially-viable equipment providing fast operation, coordination and ...

The RESs are generally distributed in nature and could be integrated and managed with the DC microgrids in large-scale. Integration of RESs as distributed generators involves the utilization of AC/DC or DC/DC power converters [7], [8]. The Ref. [9] considers load profiles and renewable energy sources to plan and optimize standalone DC microgrids for rural ...

Simulations are conducted on MATLAB/Simulink and the results show that the protection system can respond rapidly to the line differential current value under short circuit fault, so as to realize the DC short circuit fault protection of DC microgrid system.

Section 2 describes the short circuit current calculations in DC systems. ... Monadi et al. in [104] presented such a protection scheme in a radial MVDC microgrid with DC circuit breakers used only at the point of coupling of the VSCs of the Distributed Generators (DGs) and in between SMGs. It proposes a protection scheme with an overcurrent ...

DC microgrid has just one voltage conversion level between every dispersed sources and DC bus compared to AC microgrid, as a result, the whole system's construction cost has been decreased and it also simplifies the control's implementation [6], [7]. Nevertheless, researchers across the world are still looking for a way to reduce the cost of manufacturing, ...

According to the fault characteristics and the ring structure of DC microgrids, this paper proposes a rapid detection scheme based on the differential current and current ...

The common short-circuit types of DC microgrid systems on offshore platforms are: (1) positive to ground short circuits, (2) negative to ground short circuits, and (3) short cir-

Describes methods for calculating short-circuit current contributions of rectifiers (of 3-phase AC bridge connection for 50 Hz), stationary lead-acid batteries, smoothing ...

This paper deals with circuit breakers (CBs) used in direct current microgrids (DCMGs) for protection against electrical faults, focusing on their evolution and future challenges in low voltage (<1.5 kV) and medium voltage (between 1.5 kV and 20 kV). In recent years, proposals for new circuit-breaker features have grown. Therefore, a review on the evolution of ...

Due to the interconnected scheme of multiple components, such as distributed generators, storage systems, and loads through converters to a common bus in DC microgrids, the possibility of fault occurrence is increasing significantly. Meanwhile, due to the huge and rapid increase of short-circuit currents, the development of a small- and large-scale DC system requires a ...

In this paper, the issues related to short-circuit calculations in hybrid AC/DC microgrids are discussed. The

DC Microgrid DC Short Circuit

reference standard for short-current calculations in DC systems is the IEC 61660, which provides a mathematical formulation of the problem. The standard only includes radial DC grids and does not consider a more complex system, such as meshed DC ...

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Due to the significant increasing interest on DC microgrid; this paper addresses the impact of short circuit fault in the AC and DC microgrids. In order to demonstrate the current evolution, ...

The application of distributed renewable energy (DER) drives the development of DC microgrid based on voltage source converter (VSC). And short circuit fault protection is a significant challenge for the development of VSC based DC microgrid. This paper proposes a transient modeling method for VSC based DC microgrid. Firstly, the transient characteristics of ...

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