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Low voltage direct current (LVDC) distribution has gained the significant interest of research due to the advancements in power conversion technologies. However, the use of converters has given rise to several technical issues regarding their protections and controls of such devices under faulty conditions. Post-fault behaviour of converter-fed LVDC system ...

LVDC for smart cities Three arguments: compatibility, power transfer capability and controllability Giel Van den Broeck o Motivation for LVDC distribution systems o Compatibility with DC devices o Increased power transfer capability o Increased controllability o Motivation for bipolar LVDC [1-4] o Increased power transfer capability

This work presents three major contributions. First, an overview and comparison of different control methods for converters in DC microgrids are provided. Both first-level controls and second-level controls are detailed and simulated. The second contribution of this work concerns a power flow algorithm tailored for DC microgrids.

There is a critical need to increase power system inertia during the grid transformation. However, in a low-voltage dc (LVDC) microgrid, many potential inertia contributors, such as energy storage systems, are linked to the local dc bus and managed by their individual distributed controllers. This configuration results in a lack of access to grid frequency ...

For dependability and reliability of a DC system, the protection plans of an LVDC microgrid are crucial where accurate selectivity of the protection scheme is imperative. On that basis, Bhargav et al. discussed an algorithm to detect and ...

Figure 2 - DC short circuit current components in an active LVDC microgrid Figure 3 - DC positive pole ground fault current path in an active LVDC microgrid with the neutral point of the MV/LV transformer grounded even if the DC generators contribution may be switched off by IGBT block. It must be pointed out that ground faults are

State of the art is to employ AC/DC drivers, connected to the local low voltage AC (LVAC) grid. However, a local low voltage DC (LVDC) grid, using DC/DC drivers and a centralized rectifier, can be more economic. Currently, it is cumbersome to assess the LVDC alternative since simple to use methodologies are missing.

In these situations, the lack of a reliable grid can be mitigated by the introduction of stand-alone DC microgrids, including small Photovoltaic (PV) generators and storage devices. This paper focuses on optimal energy management and power supply reliability of ...

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Abstract--Low Voltage DC microgrids emerge as a viable alternative to AC microgrids. A large research interest is noted towards fast and selective protection of DC grids, typically focusing ...

This paper presents a mixed approach illustrating both simulation and experimental results of a grid-connected DC microgrid which includes a photovoltaic power source and a battery storage system.

Central to this project is the design and implementation of a low-voltage direct current (LVDC) microgrid, which optimizes energy generation, storage, and consumption. The project embraces circular economy principles by focusing on material repurposing, refurbishment, and energy efficiency.

The LVDC microgrid was modeled and simulated using power systems computer-aided design (PSCAD). In addition, the proposed hybrid method was implemented using MATLAB"s wave menu, a script m-file ...

The DC MG Control techniques promise that the control will be improved, steady, and efficient. The PE converters act as an interface between the grid and the load which may provide proper control to the microgrid with modified voltage regulation, and better distribution of current (Zhang et al. 2016).This interface may simplify the connections of ...

Current trends indicate that worldwide electricity distribution networks are experiencing a transformation toward direct current (dc) at both the generation and consumption level. This tendency is powered by the outburst of various electronic loads and, at the same time, the struggle to meet the lofty goals for the sharing of renewable energy sources (RESs) in ...

In recent years the development of the LVDC distribution networks is under consideration. DC electrical distribution offers several advantages compared to AC in many applications, in particular in the presence of distributed generation and energy storage systems like high efficacy, flexibility and simple integrated to renewable sources. The DC distribution allows to integrate in a more ...

Abstract--Low Voltage DC microgrids emerge as a viable alternative to AC microgrids. A large research interest is noted towards fast and selective protection of DC grids, typically focusing on hybrid or full solid state solutions. In this paper, the use of fuses as short-circuit protection in Low Voltage DC microgrids is evaluated.

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