Bus voltage fluctuation of photovoltaic microgrid

How does DC bus voltage affect voltage-sensitive loads?
As a result, DC bus voltage suffers from rapid changes, oscillations, large excursions during load disturbances, and fluctuations in renewable energy output. These issues can greatly affect voltage-sensitive loads. This study proposes an integrated control method for the bus voltage of the DC microgrid to solve the abovementioned problems.

How can a dc microgrid reduce voltage fluctuations?
Improving the inertiaof a DC microgrid is an effective way to reduce DC voltage fluctuations. Initially,the problem of the low inertia of DC microgrids is mainly solved by adding hardware devices,such as supercapacitors [6,7]. However,their high cost is not conducive to practical engineering applications.

How to increase the virtual capacity of a dc microgrid?
In [9,10,11],the virtual capacity of the system is increased by improving the port converter control strategyto enhance the inertia of the DC microgrid and reduce DC voltage fluctuation.

Why does DC bus voltage fluctuate quickly?
Thus,the DC bus voltage can fluctuate quickly when constant power load changes or fluctuations in the output of renewable energy sources occur. This condition can also lead to problems,such as the inability of output voltage to accurately track the rated voltage and oscillations in the bus voltage .

How to improve the stability of DC microgrids?
The inertia of the system can be increased by reducing the degree of bus voltage oscillations and solving the problem of large voltage deviations. Current methods for improving the stability of DC microgrids are positive and passive damping strategies.

How does integrated control strategy affect DC bus voltage change rate?
Under the integrated control strategy,the DC bus voltage change rate slows down significantly,the oscillation amplitude is reduced to about 2 V,and the bus voltage recovers to 800.5 V after the voltage compensator is operated. Experimental waveforms comparing the method in with the proposed integrated control strategy

The power fluctuations generated by each unit cause the changes of the internal power in the microgrid, which leads to DC bus voltage fluctuation. Therefore, it is essential to ...

DC microgrids are highly compatible with photovoltaic (PV) generation because of their direct-current properties. However, with the increasing integration of PV sources into DC ...

fluctuation of output voltage on PV is the violent fluctuation of DC bus. A new P& O method is proposed. The

first traditional current instruction tracking MPPT method is used to adjust the ...

The power of photovoltaic power generation is prone to fluctuate and the inertia of the system is reduced, this paper proposes a hybrid energy storage control strategy of a ...

Given the challenges of intermittent PV power generation, load fluctuation, and the economy of microgrid systems, it is necessary to realize the control of multiple objectives, ...

The control objective of AC-DC hybrid microgrid is to ensure the stability of DC bus bar voltage, AC bus bar voltage and frequency[5]. The coordinated control strategy of hybrid microgrid was ...

The bus voltage fluctuation, the current circulation, and the rationality of power distribution are improved. ... In Section II, the DC microgrid system with PV/ battery/ PEMFC ...

In the hybrid AC/DC microgrid, the random fluctuations of the PV output power will cause the voltage variation of microgrid bus. The power fluctuations have significant negative effects on ...

As can be seen from Figure 8, at the moment of 1 s, due to the intermittent, uncertain and real-time changes of the power output of the distributed power supply in the ...

In a photovoltaic DC microgrid, the intermittent power supply of the distributed generation and the fluctuation of the load power will cause the instability of the bus voltage. An ...

The Matlab/Simulink simulation results show that when the light intensity and load change suddenly, the DC microgrid bus voltage fluctuation amplitude of the virtual motor droop ...

The solar DC microgrid system"s bus voltage serves as a reference point for assessing the system"s safety and stability [1]-[3]. Nonetheless, because of the unexpected and fluctuating ...

Figure 9a indicates that at t = [0,2.0]s PV output power is about 25 kW, and at t = [2.0, 4.0]s PV output active power is about 38 kW. Figure 9b indicates that DC bus voltage ...

Considering the impact of photovoltaic power generation and load power fluctuations on the bus voltage stability, applying the active disturbance rejection control (ADRC) theory, the BESS ...

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