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An attempt to Design and Analysis of Multilevel Converter Topology for Renewable Energy Applications

Publisher: IEEE Cite This PDF

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Abstract:Multi-level inverter system architecture and simulation has great potential to integrate and expand the solar photovoltaic system. The multi-stage inverter design is based on a number of topologies. The improved space vector pulse width modulation makes it possible both in qualitative and quantitative terms to improve systems efficiency and production. The device can be connected to the photovoltaic solar system. Generated DC power is link to the AC grid through the inverter and power transformers. Harmonic filters and massive, expensive, and lossy transformers are used in traditional inverters. Multi-level inverters with lower Total Harmonic Distortion (THD), inductor-free design and increased control range are a viable alternative to conventional inverters. They create a steps-like waveform that looks a lot like a sine wave. Smart grids can include a lot of distributed sources, and if those sources have low THD, filtering them at the common point of connection isn't as difficult. This paper proposes 19-level inverter with high boosting power and minimal THD. Phase Opposition Disposition Pulse Width Modulation (PODPWM) technique modulates the inverter switches for voltage balance and switching losses minimization. Simscape Power Systems' MATLAB Simulink toolkit used for simulation.

Published in: 2022 IEEE 10th Power India International Conference (PIICON)

Date of Conference: 25-27 November 2022INSPEC Accession Number: 22682128

Date Added to IEEE Xplore: 20 February 2023DOI: 10.1109/PIICON56320.2022.10045087

► ISBN Information:Publisher: IEEE

► ISSN Information:Conference Location: New Delhi, India

https://ieeexplore.ieee.org/document/10045087 1/4