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A COMPARATIVE INVESTIGATION OF 5-LEVEL, 9-LEVEL AND 11-LEVEL CONVENTIONAL CASCADED H-BRIDGE MULTILEVEL INVERTERS BY USING SIMULINK/MATLAB

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ABSTRACT

This paper aims to extend the knowledge about the performance of different Cascade H-Bridge multilevel inverters (CHB-MLI) through harmonic analysis. Large utility applications require advanced power electronics converter to meet the high power demands. As a result, multilevel power converter structure has been introduced as an alternative in high power and medium voltage situations. A multilevel converter not only achieves high power ratings, but also improves the performance of the whole system in terms of harmonics, dv/dt stresses, and stresses in the bearings of a motor.

Multilevel inverters are becoming more popular in the power conversion systems for high power and power quality demanding applications. The MATLAB based simulation on SIMULINK platform is presented for Cascade H-Bridge multilevel inverter (CHB-MLI) topology of Single Phase cascaded H-bridge Multilevel Inverter for 5, 9, and 11-levels. A detailed comparison of Cascade H-Bridge multilevel inverters (CHB-MLI) are presented in the paper based on number of power devices used, Total Harmonic Distortion.

KEYWORDS: Cascade H-Bridge Multilevel Inverter (CHB-MLI), Flying Capacitor Multilevel Inverter (FC-MLI), Neutral Point Clamped Multilevel Inverter (NPC-MLI), Total Harmonic Distortion (THD).