

## **A survey of multilevel voltage source inverter topologies, controls and applications**

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### **ABSTRACT**

Multilevel converters tremendous positive contribution in the field of power electronics and renewable energy has been the reason behind the surge in its research interest. The converter has put hope in the minds of power electronic engineers that a time will come when it will break a record by providing an efficient means of utilising the abundant renewable energy resources. In an effort to report the recent advances in renewable energy conversion technology, this paper presents a review of multilevel voltage source converters that are widely being used in engineering applications. It reports the technological advancements in converter topologies of Flying Capacitor (FC), Neutral Point (NPC) /Diode Clamped, and Cascaded HBridge (CHB) with their respective advantages and disadvantages. Recent customized/hybrid topologies of the three-phase multilevel inverter with reduced component count and switching combination are reported. The paper also reviewed different modulation techniques such as the multilevel converter carrier base PWM, Space Vector Modulation techniques (SVM), and Selective Harmonic Elimination method (SHE-PWM). Finally, various multilevel converters areas of application were highlighted. This review will expose the reader to the latest developments made in the multi-level converters topology, modulation techniques, and applications.

### **KEYWORDS;**

Multilevel topology; Voltage source converters; Modulation technique; Reduced device count