A New Proposed Symmetric Multilevel Inverter with Optimum Number of Components

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Abstract— The main aim of this thesis is to present a new synthetic structure for symmetric multilevel inverters (SMLIs) which is able to generate ac output voltage with minimum number of switches. In multilevel inverters (MLIs), the total costs, circuit size, reliability and complexness of control scheme are directly depended to the number of circuit components required. The proposed inverter uses less number of circuit devices compared with the conventional SMLIs. Proposed topology is comprised of a new switched dc sources converter (Even Level Producer Unit) which can generate only even levels at the output and an extra circuit which can produce all positive and negative levels. A comparative analysis of proposed structure with the recently published topologies has been made in terms of switches, power diodes and gate drivers count requirement, DC voltage links and blocking voltage. Reduction in the number of switches, and driver circuits are advantages of the proposed inverter. Another advantage of this structure over the mentioned ones, is the lower number of on-state switches which reduces power losses. Also Simulation and experimental results are presented to confirm the performance of proposed multilevel inverter.
Index Terms— Symmetric multilevel inverter, Switched dc sources converter, comparison, New structure

Keywords : Key, symmetric, DC link, loss reduction