Power loss analysis of current-modules based multilevel current-source power inverters

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Author Order	4 of 4
Accreditation	1
Abstract	A power loss analysis of multilevel current-source inverter (MCSI) circuits developed from two basic configurations of three-level current-source inverters, i.e. H-bridge and common-emitter inverter configurations is presented and discussed. The first circuit topology of the MCSI is developed by using DC current modules connected to the primary three-level H-bridge inverter. The second MCSI circuit is created by connecting the current-modules to a three-level common-emitter inverter. The DC current modules work generating the intermediate level waveform of the inverter circuits. Power loss analysis of the both topologies was carried out to explore the efficiency performance of the inverter circuits. The results showed that for the H-bridge and common-emitter MCSI using DC current modules, the amount of conduction losses in the inverter circuits could be diminished when the level number of AC output current increase. The measurement test results have also proved that using these MCSI topologies, the power conversion efficiency will also increase.
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