Efficiency improvement using less power electronic devices of multilevel inverter

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Abstract:

In recent years, many comprehensive researches have been done on multilevel inverters used in high power and voltage applications mainly due to their beneficial points such as less harmonic distortion of output waveforms, less voltage variation of switches, and less intervention of system's electromagnetic waves. These researches on multilevel inverters mainly concentrate on two general aspects: structure of inverters and their control techniques**.** Most of the multilevel inverters consist of power electronic switches, DC voltage sources, transformators, and capacitors. Electronic devices used in these inverters cause a harmonic injection to the circuit of power lines. Therefore it makes the waveforms of the circuit and power system's voltage curved, which leads to the reduction of quality in the system power**.** Consequently, using less number of electronic devices in the structure of inverters leads to the reduction of switching loss, cost, and circuit size. In this paper, it is tried to show that using multilevel inverters with less power electronic devices brings about lower circuit loss and higher production and power quality of the system.

Keywords: Voltage source inverter , Multilevel inverter , PWM , Power quality

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[DOR: 20.1001.1.23222468.1392.2.2.8.9]
Journal of Novel Researches on Electrical Power - Vol. 2-No. 2- summer 2013