

INVESTIGATIONS OF HARMONICS AND SWITCHING LOSSES ON DIFFERENT MULTILEVEL INVERTER CONTROL TECHNIQUES BY SIMULATION

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Abstract

The use of conventional two-level pulse width (PWM) modulation inverters Provide less distorted voltage and current but at the cost of high switching losses due to high switching frequencies. Multilevel inverters have been an important development in recent years, emerging as viable alternative for high power and medium voltage applications. The use of multilevel inverters can overcome the disadvantages in the two-level PWM inverters. This paper compares switching losses and total harmonic distortion in conventional two-level with Multilevel Inverters (three-level and five-level) at different switching frequencies. For a lower level of THD and switching losses an optimized switching frequency has been obtained. Sinusoidal PWM technique is used to control the switches of the inverter. Diode clamped three-phase topology is considered for study. Simulation study confirms that reduction in harmonic distortion and switching losses as the number of the levels increases. For simulation Mat lab/Power System Block set/Power GUI has been used.

Keywords : Harmonics, Multilevel inverters, Pulse width modulation, Switching losses, Total harmonic distortion, Matlab.