PERFORMANCE EVALUATION OF A GENERALIZED MULTILEVEL INVERTER WITH DIFFERENT OPERATING MODES

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Degree of Master of Science in Electrical Engineering

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Name of the Supervisor: Prof. J.P. Karunadasa

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Abstract

Multilevel inverters are found in many applications in high power levels. These converters are available in different topological options, such as Cascaded Half Bridge, Neutral Point Clamp, Flying Capacitor, Hybrid and so on. By selecting appropriate switching sub-circuit, generalized multilevel inverter can be used to derive all common topologies.

A Generalized 9 Level Inverter is developed and controlled to operate in Cascaded Half Bridge, Neutral Point Clamped and Flying Capacitor modes for operation in 3, 5, 7 and 9 levels with square-wave and Pulse Width Modulation control. Relative performances were investigated in terms of Total Harmonic Distortion and efficiency.

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LIST OF ABBREVIATIONS

Abbreviation	Description
PWM	Pulse Width Modulation
SWM	Square Wave Modulation
NPC	Neutral Point Clamped
CHB	Cascaded Half Bridge
FC	Flying Capacitor
THD	Total Harmonic Distortion
G9LI	Generalized 9 Lever Inverter
SV	Space Vector