## HARMONIC OPTIMIZATION AND OUTPUT ENHANCEMENT IN CASCADED MULTI-LEVEL INVERTER BY CONSIDERING MULTICARRIER PWM TECHNIQUE

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*Abstract:* This paper presents different types of modulation techniques for cascaded MLI to reduce harmonics presence in output voltage of the inverter. The paper starts by generating multilevel inverter reference waveforms that are sinusoidal and triangular in nature. In this paper, different multicarrier PWM techniques have been used and at load side a low pass filter is also introduced to get less harmonic contents. This paper includes APOD technique along with SPWM and modified-SPWM technique. In this I'm proposing a new technique Modified PODPWM which gives less THD than PODPWM and magnitude is also more than that of PODPWM for keeping MI same. The all strategies have been confirmed by MATLAB simulation using a cascaded five-level inverter with different type of loads.

Key Words: PWM, SPWM, PODPWM, Modified-PODPWM, IGBT, THD.

## 1. INTRODUCTION

Quality of an output voltage (or current) waveform can be increase by decreasing in ripple content which is achieved by leveling in output voltage. To achieve this multilevel inverter is uses. MLI gives an output which have different number of voltage level so that power rating of the inverter can be increase. By increasing in level of voltage THD reduces and more output can be obtain. MLI can be classified as Diode-clamped MLI, Flying-capacitor MLIs, Cascaded MLI [3], [4].

In CMLI, desire output voltage synthesizes from several separate dc sources. Series connection of single-phase full bridge (H-bridge) makes a cascaded MLI. Each H-bridge contain a dc source. The cascaded inverter doesn't require any voltage balancing capacitors or voltage clamping diodes. Though this inverter uses separate input dc sources so it is well applicable for renewable source like fuel cell, biomass, photovoltaic etc. [5].

Cascaded H-Bridge (CHB) configuration has become more popular in adjustable-speed drive and high power application. For industrial application purpose three-phase CMLI is very useful because all three-phase drives like 3-phase induction machine, BLDC drive etc. can run from CMLI at high efficiency. A low Pass filter (LC) is used to eliminate higher order harmonics from output of the inverter [9].

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