

# **AN ABSTRACT OF A THESIS**

## **MODELING AND CONTROL OF A THREE-PHASE THREE-LEVEL DIODE CLAMPED CONVERTER**

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The main concept of multilevel converters is to use low rating devices to achieve medium and high power by connecting these low rating devices in series. The three-level converter has several advantages of large capacity, large voltage, and low current waveform distortions when compared to two-level converters. The focus of this thesis was on three-level diode clamped converter and accordingly, this thesis dealt with the generalized discontinuous carrier-based PWM (GDPWM) scheme for controlling the neutral point voltage. An analytical technique was developed for determining the expressions for the modulation signals used in the carrier-based non-sinusoidal scheme. It also introduced a computationally efficient three-level GDPWM, which has been verified through simulation and as well as experimentally.

Novel techniques were developed to control three-level three-phase three-leg rectifiers using natural variables and the dq components of th