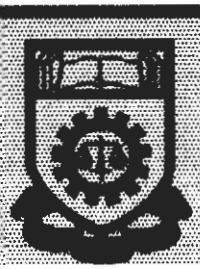
DEVELOPMENT OF H-BRIDGE CIRCUIT AND CURRENT CONTROL CIRCUIT FOR USE IN ACTIVE FILTER

Thesis is presented in partial fulfilment for the award of the Advanced Diploma in Electrical Engineering of INSTITUT TEKNOLOGI MARA



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ABSTRACT

This project is concerned with the development of active filter shunt compensator that uses current injection technique. To realise this injection technique, the MOSFET H-Bridge and current control loop are used. The shunt compensator measures current from the system to be compensated and switches pulses of current from the bus capacitor that could effectively absorb or inject compensated current from/to the system. Simulations were carried out to predict the performance of the proposed system as a solution to problems. Experimental tests were performed on the H-Bridge and current control circuit and the results were also discussed.

ACKNOWLEDGEMENT

In the name of ALLAH s.w.t., the Merciful, the Beneficent, the One. Praised be to Him alone for *HIS* endowment that let me to complete this final project.

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CHAPTER 1

1.0 INTRODUCTION

A d.c load usually fed from a rectifier, will in its voltage have a harmonics contents, the lowest order of which is the pulse number of the rectifier. Harmonics at multiples of the pulse number will also exist. The rectifier will have a higher harmonic content in the load current than when the rectifier is uncontrolled [4],[6],[7].

The harmonic voltage present in the voltage waveforms will inevitably give rise to harmonic current of the same frequency in the load. Although many of the waveforms were drawn with the assumption of level d.c. load current, in practice this assumption of infinite load inductance is not always justified, and harmonics current do exist in the load waveform. The effect of harmonics have on the load must be judged in respect of individual application, but often they merely contribute to increased losses.

The switching action of the rectifier device inevitably results in non sinusoidal current being drawn from the a.c. supply system. In essence, the a.c. supply delivers a sinusoidal voltage with power flow relating only to the fundamental frequency. The load then converts some of this power to higher frequencies, and transmit harmonic power back into the supply system. Hence a rectifier load acts in part as a harmonic generator.