A PROPORTIONAL INTEGRAL CONTROL LOGIC ACTIVE FILTER FOR POWER CONDITIONING SIMULATION IN MATLAB.

Project report is presented in particial fulfillment for award of Bachelor of

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ABSTRACT

Harmonics generation can lead to serious power quality problem if it is not reduced to acceptable level. Electric components content of non-linear loads contribute to serious harmonic injection to the main supply line. This project proposed the design of a simple three-phase industrial networks load for the purposes of studying the harmonic. The active filter is designed to cancel lower order harmonic generated by non-linear loads using LC tank tuned load along with Pulse Width Modulation (PWM) rectifier topology. The study includes the harmonic analysis without filter and the with filter (APF) control logic. This project is base on the power system block set (PSB), within the MatLab/ simulink V6.1 software.

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CHAPTER 1

INTRODUCTION

1.1   Introduction

Harmonics in power system have received increased attention in recent years with the widespread application of solid-state power switching devices in a multitude of power electronic application. The ac power system has a substantial number of large harmonic generating devices, such as adjustable speed drives for motor control and switch-mode power supplies used in a variety of office equipments These devices draw non-sinusoidal load currents consisting primarily of lower order 5th, 7th, 11th, and 13th harmonics that distort the system power quality [1].

Power quality related disruptions, ranging from system malfunction and hardware damage to costly data loss and downtime [1]. With the widespread use of harmonic-generating devices the control currents to maintain a high level of power quality is becoming increasingly important. Amongst the largest sources of harmonics are converters. Converters use solid-state switching devices to convert power from one frequency to another. These switching devices maybe in the form of diodes, thyristor or many other power electronic devices.

Initially these projects focus on the model of an industrial network system and the nonlinear current from various types of load. The second step is to design the Proportional Integral (PI) controlled active filter to reduce harmonics on the three-phase power distribution system and to improve the system power quality.