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**MEASUREMENT OF HARMONIC BASED ON LOW POWERED
EQUIPMENT**

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ABSTRACT

Power Quality (PQ) is an important issue nowadays owing to the increasing use of sensitive loads such as computers, industrial devices, communications and medical equipment and nearly almost all of the load. From the PQ perspective, these types of loads are not good since they are not only sensitive to poor service quality but also responsible for adversely effecting the quality of power supply.

Harmonic is the major part of power quality problems besides transients, sags/surges, dropouts, voltage flicker and interruptions power failures. This fact leads to the importance of knowing the level of harmonics inside the non-linear loads as long as the characteristics of load that generate them.

This paper deals with harmonic measurement of low powered equipment, which have been selected as the harmonic generated. The equipment consists of computer, typical types of ballasts and different types of energy saving lamps. Harmonic measurements to these loads were carried out using 500 MHz digital oscilloscope.

TABLE OF CONTENTS

CHAPTER DISCRIPTION	PAGE
Acknowledgement	
Abstract	ii
List of figures	iii
List of tables	iv
Contents	
1 INTRODUCTION	
1.1 Introduction	1--
2 HARMONICS	
2.1 Fundamental of harmonics	3
2.2 Harmonic distortion	3
2.3 Origin of harmonics	5
2.4 Flow of harmonic current	7
2.5 Performance parameter	8
2.5.1 Harmonic Factor (HF)	8
2.5.2 Total Harmonic distortion (THD)	9
2.5.3 Lowest order Harmonic (LOH)	9
2.5.4 Crest Factor (CF)	10
2.6 Harmonic effects	10
2.6.1 Motor and generators	10
2.6.2 Transformers	10
2.6.3 Power cables	11
2.6.4 Capacitor1	
2.7 Harmonic mitigations	11
2.7.1 DC link choke	12

CHAPTER 1

INTRODUCTION

1.1 Introduction

Disturbances in power network such as faults, outages, transient and harmonic are widely acknowledged in power engineering circles. Regarding to this matters, lots of monitoring and mitigations have been made. Nowadays, the problem is going to be more complex as the increase of technology resulting the load composition is taking place in the premises. This phenomenon occurs due to the widespread utilise of computer equipment, energy saving lamps, electronics ballasts, colour TV receiver etc[3]. This trend is set to be increased as the increase of electronic technologies rely on conversion of AC supply to DC, which contributes to the more complexity of PQ problem.

PQ embraces all aspect associated with amplitude, phase and frequency of the voltage and current waveforms of power circuits. Adverse PQ environments may result from transient conditions developing in the power circuit, the installation of one or more non-linear loads of relatively large rating or large number of non-linear loads of low rating.

PQ disturbance at the utility level may result in spurious operation of remote controls and protective devices, overheating of cables, transformers and rotating machinery, and errors in energy metering. PQ disturbances in the customer premises may result in the loss of computer data owing to voltage dips with duration of only a few milliseconds. Even shorter voltage dips may cause the tripping of industrial drives.

In order to study these and other related phenomena, the author has conducted a series measurements of harmonic content inside the selection of low powered non-linear loads, as harmonic is one of the PQ problems. The selection of load consists of computer system,