

## ANALYSIS AND SIMULATION OF HARMONICS FOR VARIOUS RESIDENTIAL LOADS USING SIMULINK

Yogesh Bhujbal

*M.E. Scholar Department of Electrical G.H.I.E.R.T.,  
S.F. Pune University, Pune*

Prof. Ravindra Joshi

*Professor of Electrical Department G.H.I.E.R.T.,  
S.F. Pune University, Pune*

Amol Chate

*M.E.Scholar Department of Electrical G.H.I.E.R.T.,  
S.F. Pune University, Pune*

### ABSTRACT

Harmonics are the by-products of modern electronic devices i.e. nonlinear loads, this harmonics by drawing current in abrupt short pulses, rather than in a smooth sinusoidal manner. Any distribution circuit feeding nonlinear loads will contain some degree of harmonic frequencies in multiples. Due to the rapidly increasing number of non-linear loads in distribution systems, the harmonic distortion of the current and voltage increases. Examples of non-linear loads are personal computer, television set (TV), fluorescent tube with electronic ballast, compact fluorescent lamp, battery charger, uninterrupt power supply (UPS) and any other equipment powered by switched-mode power supply (SMPS) unit. As the number of harmonics-producing loads in residences has increased over the years, it has become increasingly necessary to address their effects on the distribution system. Power Quality of distribution networks is severely affected due to the flow of these generated harmonics. Harmonic currents generated by nonlinear loads can cause problems on the power system. These harmonics can cause excessive heat in many appliances, and hence reduce the life span of the distribution transformer supplying such loads, protecting equipments in power system. It can also increase power consumption and reduce system efficiency. It also lowers the system power factor. In this paper presents the results of a SIMULINK of harmonic distortion caused by different non linear home appliances and analysis of percentage total harmonic distortion which is found between ranges of 50 to greater than 200.

**KEYWORDS:** %THD, Non linear load, Matlab-Simulink, FFT tool, Power quality.

### INTRODUCTION

Electric utilities are concerned about decreasing power quality and its potential impacts on the grid. As residential customers add more electronics to the home and replace existing mechanical switching equipments by electronic switching equipments, there is