



ANFIS based Custom Power Devices to Improve the Power Quality in Distribution System

Ellapu Yagna Varahala Rao¹ | **D. Dhana Prasad²**

¹PG Student, Dept of EEE, Avanthi Institute of Engineering & Technology, Visakhapatnam, India.

²Associate Professor, Dept of EEE, Avanthi Institute of Engineering & Technology, Visakhapatnam, India.

To Cite this Article

Ellapu Yagna Varahala Rao and D. Dhana Prasad. ANFIS based Custom Power Devices to Improve the Power Quality in Distribution System. International Journal for Modern Trends in Science and Technology 2022, 8(05), pp. 01-06. <https://doi.org/10.46501/IJMTST0805001>

Article Info

Received: 22 March 2022; Accepted: 19 April 2022; Published: 26 April 2022.

ABSTRACT

In present scenario power quality is the major concern for electrical power system. In order compensate these problems lot of methods available in the market. This project proposes application of custom power devices to power system. For achieving better power quality an UPQC and IUPQC is provided in this paper. Both UPQC and IUPQC is a structure of two filters such as, series and shunt filters. The causes for poor power quality of system is due to harmonics, power factor variations and changes in system voltage. The purpose of these converters is to mitigate the PQ issues. The reference signals required for series and shunt converters of CPD system is generated with the help of conventional controllers and PWM controllers. The PLL used to match the phase sequence of converters. For obtaining better improvement in Power Quality this paper is implemented with one of the AI technique such as neuro-fuzzy controller. The purpose of anfis is used to control the DC Link Voltage of CPD. With the help of this anfis technique, the variations in voltage and current are reduced to enhance the power quality. The effectiveness of this proposed system with anfis technique is tested and verified using Matlab/Simulink environment.

KEY WORDS: Interline Unified Power Quality Conditioner (IUPQC), ANFIS, UPQC, Power Quality, THD.

1. INTRODUCTION

The latest power distribution system is fetching very susceptible to the various PQ (Power-Quality) problems [1]. PQ in distribution systems is a focal concern for industrial, commercial and residential purposes. Increased affair above this matter has run to quantifying PQ variations, reviewing the features of power disturbances and specifying solutions to these power quality problems. PQ is mostly exaggerated by the increased usage of non-linear loads such as powered electronic equipment, variable speed drives, and electronic control gears. Indigent power quality can disturb the security, reliability, and efficiency of several categories of equipment. Many parts of PQ are

harmonics; flicker and imbalance have turn out to be stern concerns. Furthermore, lightning strikes on transmission lines, switching of capacitor banks and several network faults can too instigate PQ problems [2].

In consequence of the growth of powered electronic devices such as Flexible AC Transmission System (FACTS) and custom power devices, deregulated power systems with multipurpose new-fangled control abilities have performed. Reasonably slight concentration, however, has been fervent to system sag enhancement [3]. It is recognised that FACTS-based devices, viz., SVC, STATCOM, and DVR can deliver an effectual solution to voltage sag difficulties. Therefore, a recent distribution system needs a better steadiness of voltage being