

**INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH
TECHNOLOGY****MODELLING AND SIMULATION OF A DYNAMIC VOLTAGE RESTORER****Geena Sharma, Vijeta Verma**

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ABSTRACT

Power quality is one of major concerns in the present era. It has become important, especially with the introduction of sophisticated devices whose performance is very sensitive to the quality of power supply. Power quality problem is an occurrence manifested as a non standard voltage, current or frequency that result in a failure of end use equipments. One of the major problem dealt here is the power sag, swell; transient.

KEYWORDS: DVR, PI controller, VSC, Linear transformer.**I. INTRODUCTION**

Today modern industrial devices are mostly based on electronic devices. The electronic devices are very sensitive to distribution and becomes less tolerant to power quality problem such as voltage sag, swells, harmonic, blackouts under and over voltage.

One of voltage drop is consider being one of the most serve disturbances to the industrial equipments.

Voltage can be increase by injected reactive power at the load point, the common method of this is to installed shunt capacitor in the primary of the linear transformer.

Another power electronic solution is to the voltage regulation is the use of a dynamic voltage restoring (DVR) is a class of custom power devices for providing reliable distribution of poor quality.

They employ a series of voltage boost technology using solid states switches for compensating voltage sag and swells.

The DVR application is mainly for sensitive loads that may be affected by fluctuations in system voltage. In this DVR made up of inverter, PI controller, Filter to increase the Quality of DVR. In this DVR we use active filter to reduce the harmonic which is introduced by Voltage source inverter (VSI).

The ideal power quality is defined by electrical power energy with pure sinusoidal supply voltage waveform at a constant frequency and a constant magnitude power quality problem is complex.

Power quality defects can be classified in different categories

- Harmonics
- Blackout
- Under or overvoltage
- Sag and swells
- Transient
- Frequency deviation
- Poor Power factor

Each defect the different causes and also different cost implication. Indian industries are affected by harmonic, polluted electrical power.



Harmonics distortion caused by non linear load is becoming a serious problem in industrial and commercial installation .Non linear load means if we apply input AC but we don't getting the input AC.

Electrical loads, drawing sinusoidal, voltage source are called linear load .They consist of only resistive, induction and capacitive passive element.

The undeniable effect of non sinusoidal, signal, harmonic terminology was introduced by **Institute of electrical and electronic engineer IEEE** in 1981 for these non sinusoidal signals in different frequencies by Fourier series.

“A sinusoidal component of a periodic wave having a frequency that is an integral multiple of the fundamental frequency is define as harmonic

For example Fundamental frequency =50 Hz 2nd harmonic frequency = $2*50 =100$ Hz

II. MAIN COUSES OF POWER QUALITY IN INDIA

With the increase in harmonic producing load in quality loads in the quality of power is decreasing.

Harmonics monument is receiving considerable attention

Power quality problems due to the following reasons is decreasing

- Demand is increase and production of power is less
- Using of inverter, computer ,IGBT power electronic devices, diode non linear load

III. EFFECT OF HORMONICS ON THE NETWORKS

All non linear loads draws non sinusoidal current which cause distortion in the voltage waveform Harmonics transfer one place and transfer the harmonic one place to other system In the power distribution network harmonics can cause following effects

- OVERLOADING of power factor correction capacitors due to their tuning for a particular frequency
- RESONANCE between capacitive reactance and transformer reactance resulting in excessive voltage and current
- REDUCED efficiency of motor due to poor power factor there is excessive of harmonic current

IV. SIMULATION MODEL

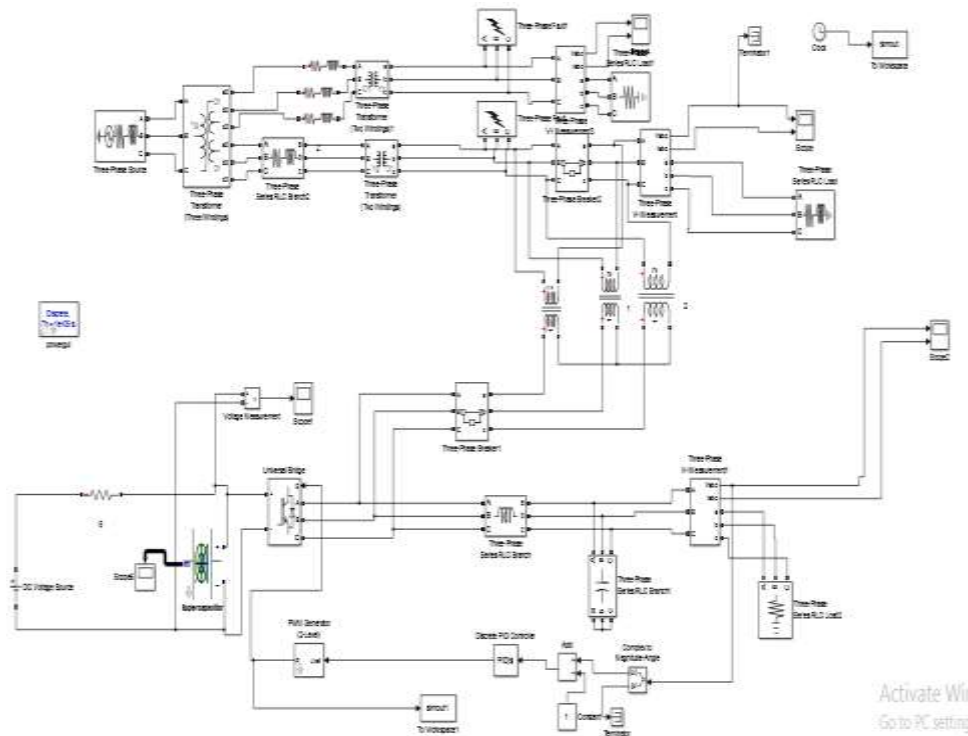


Fig.1. Simulation model of DVR

V. RESULTS

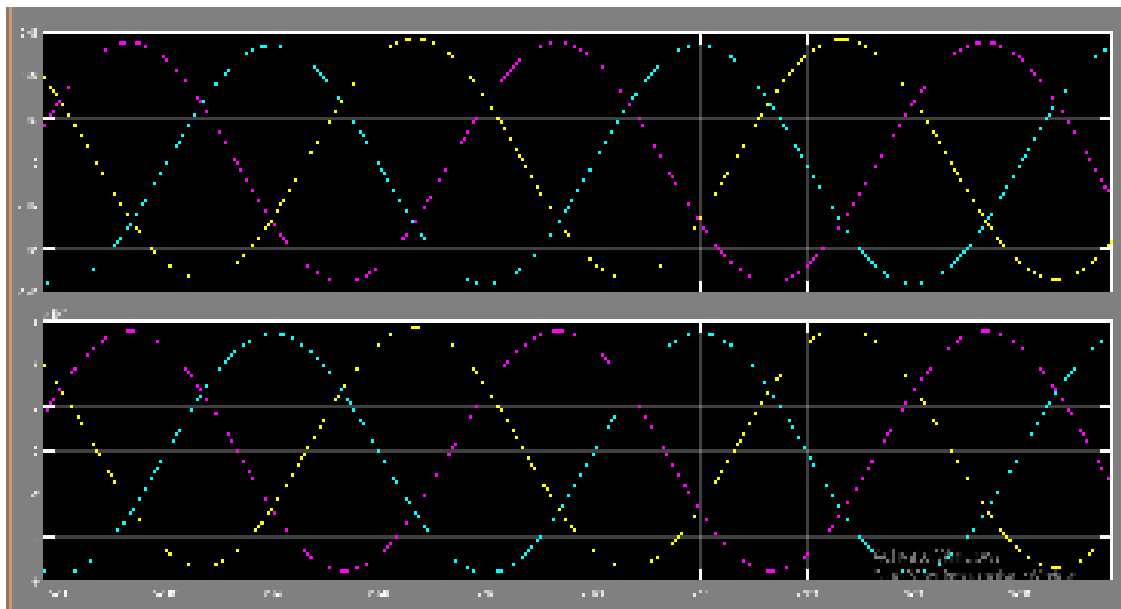


Fig.2. Simulation result of DVR

VI. CONCLUSIONS

In this paper, we understand the function of DVR in all fault condition such as symmetrical fault as well as unsymmetrical faults. Function of DVR in this fault condition. In the fault condition, DVR boost up the fault voltage. DVR used as custom devices in distribution systems.

VII. ACKNOWLEDGEMENT

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