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The Various Issues In Power Quality Regarding With The Power System

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ABSTRACT

The paper shows the problems regarding with the power system and also shows their respective effects as well as the solutions as per needed for the working of the electrical and the electronics devices. Now a day there is the increasing in the utilities and the population crises. We have to avoid the stresses on the power system some modern technique or solution should be utilized. In Power Quality we must understands their characteristics, effects of Power Quality, solutions and also gives the corrective method for their problems. Each and every things of the electrical and the electronics having their own standard, this will be important for the working in designing and the manufacturing.

Keyword *:- **Power Quality Problems, Power Quality standard, Power Quality solution**.*

1. INTRODUCTION

Firstly power quality means the reliability of those particular things [8]. Power Quality (PQ) related issues are increasing more and more because due to the rising in the consumers side is offers the more load. The larger handling of use of sensitive devices such as electronic equipment, and the software based technology equipment, power electronics such as adjustable speed drives (ASD) programmable logic controllers (PLC), energy-efficient lighting, led to a complete change of electric loads nature. Aveng the micro chips which are also many sensitive. The electronics equipments are suffers form of power quality problems. While studying the power quality there are the two main load regarding with electronics and electrical equipments sensitive load & non-linear load .[24] While new and useful efforts been taken by the utilities, one of the not all require a proper stage of power quality l than the stage offended advanced electrical networks. This can be decided that the higher levels of power quality can taken for the consumers [24]. Power Quality maintainace organization check and avoid the remedies, problems and issues [25, 12, 23]. In these we discuss and study the study of power quality issue that is problems effects, standard of their respective problem and the preventives and solution also [24].

2. POWER QUALITY PROBLEMS OR ISSUES:

In generally the problems are such as more due to the poor grounding ,wiring loose connections and the electrically operated equipments are mainly offer the power quality [9,10,11,12,15,16] It is more complex to determining or detecting the problems in the electronics parts. We observe the symptoms of that particular device is-

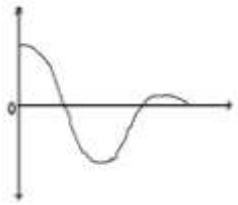
1. Misuse or malfunctioning of the equipment again and again.
2. The protecting device such as the circuit breakers is get trip without getting overload
3. Due to the natural crises failure of the equipments
4. The automated system gets stop or damage without reason
5. Due to swinging of the transmission line losses are occurs
6. Due to sudden change in the voltage there is the damage of microprocessor chip.

In power system there is the problems like the voltage sag , voltage swell , Interruption, Voltage unbalance, flickers This all are the serious issues in power quality which makes the system dirty [6,14,18,19,24]

3. POWER QUALITY PROBLEMS:

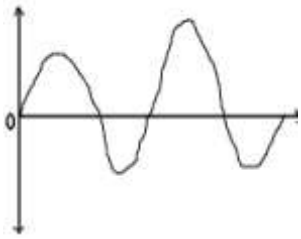
a) Voltage Sag
b) Voltage Swell
c) Interruption
d) Voltage Spike
e) Harmonics
f) Voltage unbalanced
h) Voltage Fluctuation

3.1 Voltage Sag (Dips):-



A reduce in of normal voltage level between within a range of 10 and 90% of the nominal rms voltage at the Power frequency having the periods or time of 0.5 cycle to 1 minute. It is generally occurs in the problems of voltage sag. This fault may appears in the transmission line and at Distribution sectors for putting in place of utility or consumers .Due to that there is the malfunctioning of the electronics equipment & also tripping of some relay without overloaded and also there is the disconnection and loss of the efficiency ,stresses are in the electric rotating machines.

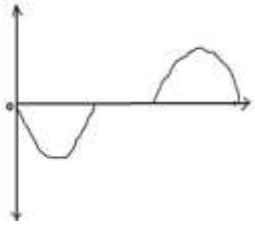
3.2 Voltage Swell:-



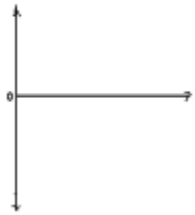
Temporary rising in the voltage, at the power frequency, outside the normal range, with period of more than one cycle and generally less than a few seconds. It may lead to Damage the electronics equipments.

3.3 Interruption:

a) For minimum Duration: The interruption of electrical supply for periods goes from few milliseconds to one or two seconds. This may because the automatic reclosing of the protecting device, failure occurs in the insulation and insulation flash-over.

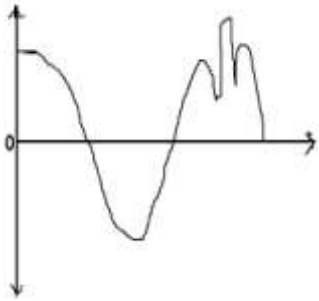


b) For maximum Duration :- The interruption of electrical supply for period goes from greater than 1 to 2 seconds. This may cause damage the equipment in the power system network, this is occurs due to storms and striking lines or poles, failure of protection devices. Also gets sparking in the electrical devices.



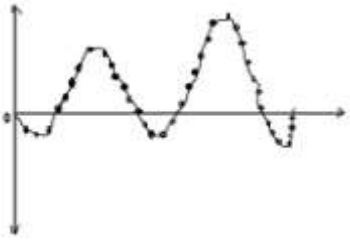
3.4 Voltage Spike:-

Very fast change in the voltage value for periods goes from l millisecond seconds to few milliseconds. These change is goes up to the thousands of volts, also in low voltage, it causes damaging of components it is generally in the sensitive devices.



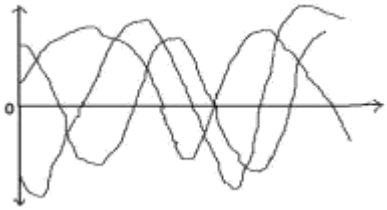
3.5Harmonics:-

The harmonics is also one of the major power quality problem generally our waveform is sinu soidal but due to harmonics there is the change in there magnitude and phase this gets disturbed and the proper waveform loss there sinusoidal nature. It gives the improper magnetizing curve or (B-H Curve) .It disturbed the electronics equipments also imbalance there frequency. Occurs the unbearable resonance, mixing of the electromagnetic interference in communication lines, also loss the efficiency of the highly speed electrical machines.



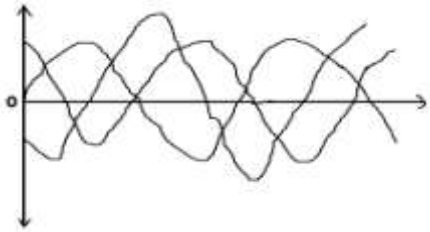
3.6 Voltage Unbalanced:-

In which the three phase voltage and the phase voltage having their respective phasor angle difference is imbalance .means the voltage are not in same .This can leads to the improper operation of three phase machine and motor also , due to imbalance wrong sequence is created and this will occurs damage the power system.



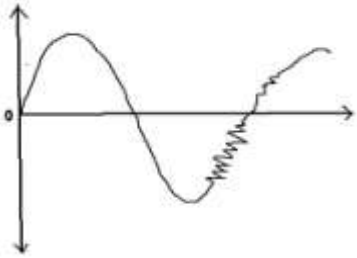
3.7Voltage Fluctuation:

The amplitude as well as voltage value is oscillated and by frequency within ranges 0 to 30 Hz with the help of the signal. it causes the arcing, oscillating or swinging the load. It disturbed the steadiness of the electric motors.



3.8 Noise:

Electrical noise is the concept in which the high frequency signals on the sinusoidal waveform on the proper waveform. This can be causes the problems the diffusion, arcing cause radiation also mixing up of the communication lines. Which is also causes the disturbances in the sensitive device such as the electronics devices [24, 28].



4. COST OF POWER QUALITY:

The cost of the electrical as well as the electronics devices can be depends on the designing, manufacturing, marketing, standard use for the devices all this components are essential for the maintaining the quality of the equipments but overall cost is depends on the facility and the marketing condition [24].

5. EFFECT OF POWER QUALITY ON THE POWER SYSTEM:

The Power System suffers from the many problems as mention above with regarding to that we need the proper solution for it. The problem will cause the sudden change or raising the voltage in as referred to its nominal voltage. The problem causes the voltage imbalance, flickers this will also disturbed the waveform. Disturbance created the harmonics and the transient which causes the fluctuation. [9, 11, 12, 14, 16, 17, 22, 23].

6. SOLUTION OF POWER QUALITY PROBLEMS:

Power Quality having divided into the two categories: Avoidance and detecting. Firstly we observe the designing and study of the manual of their respective equipments so that we must place or takes the power conditioning equipment at the utility side of the meter also at the end users side of the meter. And it is also essential that to check the grounding and wiring of the equipments because due to loose connection there is the malfunctioning in the work of the equipments. [9, 11, 12, 14, 16, 17, 22, 13]

7. POWER QUALITY STANDARD:

There are many organization which are gives there proper standard for the respective electrical and electronics devices so there are the standard are ANSI,CENELEC,CISPR,EPRI,IEC,IEEE,ITI,NEMA,NFPA,NIST,UL

1) ANSI:-American National Standard Institute use for the steady state voltage rating

2) CENELEC:-Regional Standard it is the Europe Union Standard Organization use for the electrical equipments.

3) CISPR:-It is International Special Committee as for the radio Interference having types the of International Standard.

4) EPRI:-Signature Newsletter on Power Quality Standard having addressed i.e. Electric Power Research Institute.

5) IEC:-It is the types of International Standard having address i.e. International Electro technical Commission

6)IEEE:-It is the International &United States standard also use for the book series having address i.e. International Electrical & Electronics Engineers

7) ITI:-It is type of Equipment Guide for examining the device having address i.e. Information technology Industry Council

8) NEMA:-It is the type of Equipment Standard use for giving the information about the devices, having address i.e. National Electrical Manufacturers Association,

9)NFPA:-It is type of Lighting protection as well as for the protecting device having address i.e. National Fire Protection Association , the standard store the national electric code.

10) NIST:-this standard gives the general information on all standards, having addressed i.e. National Center for Standard and Certification.

11) UL: - it is the safety Standard for equipments having addressed i.e. Underwriters Laboratories.

All standard contain some information regarding with the electrical and electronics equipments. [3]

8. CONCLUSION:

From the studying the issues, problems and also studying the solution we can minimize the problem by using the proper standard equipment. And it is necessary because developing in the industrial sector we need the standard for specific equipments,Due to the power quality problems system loose there efficiency and so more thing we discuss in this paper .So, it can be avoid the malfunction of the system ,These information is also useful for the studying the power quality. Due to that we gives the approximate solution on the problem.

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