Glossary

[Enclosed with order dated 31.12.08 passed in suo-motu petition No. 39 of 2006(M)]

1. Active power: The product of the RMS value of the voltage and the RMS Value of the in phase component of the current. A term is used for power when it is necessary to distinguish among apparent power, complex power and its components active and reactive power. (book electric power distribution engineering-Turan Gonen)

    Active power: means the electrical power, being the product of root mean square (rms) voltage, root mean square (rms) current and cosine of the phase angle between the voltage and current vectors and measured in units of 'Watt' (W) or in standard multiples thereof; (As per CEA)

2. Bus bar: A conductor, or group of conductors, that serves as a common connection for two or more circuit.

    (Book electric power distribution engineering-Turan Gonen)

    The point at which power is available for transmission. A conductor or group of conductors that serve as a common connection for two or more circuits, generally in the form of insulated cable, rigid rectangular or round bars or stranded overhead cables held under tension. (from Web Sites)

3. Capacitor:

    An indivisible part of a capacitor consisting of electrode separated by dielectric material. A device, the primary purpose of which is to introduce capacitance into an electric circuit. (Book electric power distribution engineering-Turan Gonen)

    A capacitor or condenser is a passive electrical component consisting of an insulating, or dielectric, layer between two conductors. When a voltage potential difference occurs between the conductors, an electric field occurs in the insulator. This field can be used to store energy, to resonate with a signal, or to link electrical and mechanical forces. (Wikipedia web sites)

4. CBIP: Central Board of Irrigation & Power.

5. Current THD: Total harmonics distortion in current, The ratio of the root-mean-square of the current harmonic content to the root mean-square value of the fundamental current quantity expressed as percent of the fundamental

    $$\%I_{THD} = \sqrt{\left(\frac{sum\ of\ square\ of\ amplitudes\ of\ all\ current\ harmonics}{square\ of\ amlitude\ of\ fundamental\ current}\right) * 100\%}$$
    (IEEE – 519:1992)

6. Fault level: Fault level in electrical system is analogous with the shock absorbing capacity of mechanical system. The fault level in MVA corresponds to the fault current flowing through the power system in the event of a short circuit in the system.

7. Grid: The inter connected system preferred for large distribution areas for a large loads which have to be supply with greater reliability with all other advantages of all inter connected system.

The layout of the electrical transmission system or a synchronized transmission network

8. Harmonics:

A sinusoidal component of a periodic wave or quantity having a frequency that is an integral multiple of the fundamental frequency. *Note: For example, a component the frequency of which is twice the fundamental frequency is called the second harmonic.* (IEEE- Technical Dictionary Pg-406)

9. IEEE : Institute of Electrical & Electronics Engineers.

10. IEEE – 519:1992: -IEEE recommended practices and requirements for Harmonics control in Electrical Power Systems. This guide applies to all types of static converters used in industrial and commercial Power System. The problems involved in the harmonics control and reactive compensation of such converters are addressed and an application guide is provided. Limits of disturbances to the ac power distribution system that affect other equipment and communications are recommended. This guide is not intended to cover the effect of radio frequency interference.

11. Impedance: The ratio of the phasor equivalent of a steady state sine wave voltage to the phasor equivalent of a steady state sine wave current
 (book electric power distribution engineering-Turan Gonen)

12. Infinite bus: A bus in the grid system having constant voltage and constant frequency.

The network or system is often referred to as an "infinite bus" when a change in input mechanical power or in field excitation to a generator unit does not cause any appreciable change in system frequency or terminal voltage.

13. Interconnecting transformers:

A Transformer connecting two electric supply system at two different voltage level. The normal flow of energy in such an interconnecting transformer may be in either direction. (Equivalent definition from IEEE- Technical Dictionary Pg-455)

14. Load cycle: The complete series of values of a periodic quantity (power) which occurs during a period. (IEEE- Technical Dictionary Pg-222)

Time period spanning one peak load. (from Web Sites)

15. Load factor:

It is the ratio of the average load over a designated period of time to the peak load occurring on that period.

 (book electric power distribution engineering-Turan Gonen)

16. Negative Phase sequence current:

Negative phase sequence symmetrical components of an unsymmetrical set of polyphase currents of M phases, that set of symmetrical components that have the (m-1)st phase sequence. That is, the angular phase lag from the first member of the set to the second, from every other member of the set to the succeeding one, and from the last member to the first, is equal to (m-1) times the characteristics angular phase difference, or (m-1)2π/m radians. The members of this set will reach their positive maxima uniformly but in the reverse order of their

designation.

(IEEE- Technical Dictionary Pg-568)

It is one of the symmetrical components having the reverse phase sequence with respect to original phasors of three current which may be unbalanced.

System operation may also become unbalanced when loads are unbalanced. This unbalance loading of the network will cause the negative sequence currents component.

17. Negative Phase sequence voltage:

Negative phase sequence symmetrical components of an unsymmetrical set of polyphase voltages of M phases, that set of symmetrical components that have the (m-1)st phase sequence. That is, the angular phase lag from the first member of the set to the second, from every other member of the set to the succeeding one, and from the last member to the first, is equal to (m-1) times the characteristics angular phase difference, or (m-1)2π/m radians. The members of this set will reach their positive maxima uniformly but in the reverse order of their designation.

(IEEE- Technical Dictionary Pg-568)

It is one of the symmetrical components having the reverse phase sequence with respect to original phasors of three voltages which may be unbalanced.

18. No load losses of transformers: Energy losses in a transformer or electric facility when energized at rated voltage and frequency but not carrying load.

(Book electric power distribution engineering-Turan Gonen)

19. Parallel Operation:

The process by which a generator is adjusted and connected to run in parallel with another generator or system (IEEE- Technical Dictionary Pg-618)

20. Plant load factor:

It is the ratio of the total actual energy produce or served over a designated period of time to the energy that would have been produced or served if the plant (or unit) had operated continuously at maximum rating
(Book electric power distribution engineering-Turan Gonen)

21. Point of common coupling:

The point of common coupling is the point in the public network nearest electrically to the consumer's installation at which other consumer's installations are already connected or may be connected in future.

(CBIP Report No 251)

22. Power Factor: The ratio of the active power to the arithmetic apparent power.

(IEEE- Technical Dictionary Pg-672)

23. Reactive power: reactive power for sinusoidal waveforms of any single frequency in a single phase circuit is define as the product of the RMS value of current & voltage and the sine of the phase angle between them.

(IS 14697:1999)

The product of the RMS value of the voltage and the RMS Value of the Quadrature phase of the component of the current.

Reactive power : means the product of root mean square (rms) voltage, root mean square (rms) current and the sine of the electrical phase angle between the voltage complexor and current complexor, measured in 'Volt – ampere reactive' (VAr) and in standard multiples thereof; (As per CEA)

24. Spinning reserve: Spinning reserve is that reserve generating capacity connected to the bus and ready to take load. (IEEE- Technical Dictionary Pg-867)

25. Stand by power: The power supply that is selected to furnish electric energy when the preferred power supply is not available.

    (IEEE- Technical Dictionary Pg-880)

26. Step up and step down transformer: A transformer in which the power transfer is from a lower voltage source circuit to a higher voltage circuit is step up transformer & a transformer in which the power transfer is from a higher voltage source circuit to a lower voltage circuit is step down transformer

    (IEEE- Technical Dictionary Pg-890)

27. SVC: A Static VAR Compensator (or SVC) is an electrical device for providing fast-acting reactive power compensation on high-voltage electricity transmission networks. SVCs are part of the Flexible AC transmission system (FACTS) family of devices. (From Wikipedia web sites)

    SVC is equivalent to a shunt capacitor and a shunt inductor, both of which can be adjusted to control voltage and reactive power at its terminals.

28. Switch gear: A general term covering switching and interrupting devices and their combination with associated control, metering, protective and regulating devices, also assemblies of these devices with associated interconnections, accessories, enclosures and supporting structures, used primarily in connection with the generation, transmission, distribution and conversion of electric power.

    (IEEE- Technical Dictionary Pg-907)

29. Transient surge: Transients are voltage disturbance of very short duration (up to a few milliseconds) but high magnitude (up to several thousand volts) with a very fast rise time.(Power Quality application guide from IEE)

    In electrical engineering, transient surge are fast, short duration spikes in voltage or current or transferred energy (energy spikes) in an electrical circuit

30. Voltage THD: Total harmonics distortion in voltage, The ratio of the root-mean-square of the voltage harmonic content to the root mean-square value of the fundamental voltage quantity expressed as percent of the fundamental

$$\%V_{THD}= \sqrt{\left(\frac{sum\ of\ square\ of\ amplitudes\ of\ all\ voltage\ harmonics}{square\ of\ amlitude\ of\ fundamental\ voltage}\right)} * 100\%$$

(IEEE – 519:1992)