

## POWER QUALITY TERMS II

### **Nonlinear Load**

Electrical load that draws current discontinuously or whose impedance varies throughout the cycle of the input ac voltage waveform.

### **Normal Mode Voltage**

A voltage that appears between or among active circuit conductors.

### **Notch**

A switching (or other) disturbance of the normal power voltage waveform, lasting less than a half-cycle, which is initially of opposite polarity than the waveform and is thus subtracted from the normal waveform in terms of the peak value of the disturbance voltage. This includes complete loss of voltage for up to a half-cycle.

### **Oscillatory Transient**

A sudden, non power frequency change in the steady state condition of voltage or current that includes both positive- and negative polarity value.

### **Overvoltage**

When used to describe a specific type of long-duration variation, refers to a voltage having a value of at least 10 percent above the nominal voltage for a period of time greater than 1 min.

### **Passive Filter**

A combination of inductors, capacitors, and resistors designed to eliminate one or more harmonics. The most common variety is simply an inductor in series with a shunt capacitor, which short-circuits the major distorting harmonic component from the system.

### **Phase Shift**

The displacement in time of one voltage waveform relative to other voltage waveform(s).

### **Power Factor, Displacement**

The power factor of the fundamental frequency components of the voltage and current waveforms.

**Power Factor (True)**

The ratio of active power (watts) to apparent power (volt-amperes).

**PLT**

The long-term flicker severity level as defined by IEC 61000-4-15, based on an observation period of 2 h.

**Pulse**

An abrupt variation of short duration of a physical quantity followed by a rapid return to the initial value.

**Pulse-Width Modulation (Pwm)**

A common technique used in inverters to create an ac waveform by controlling the electronic switch to produce varying width pulses. Minimizes power frequency harmonic distortion in some applications, but care must be taken to properly filter out the switching frequencies, which are commonly 3 to 6 kHz.

**Resonance**

A condition in which the natural frequencies of the inductances and capacitances in the power system are excited and sustained by disturbing phenomena. This can result in excessive voltages and currents. Waveform distortion, whether harmonic or on harmonic, is probably the most frequent excitation source. Also, various short-circuit and open-circuit faults can result in resonant conditions.

**SAG**

A decrease to between 0.1 and 0.9 pu in rms voltage or current at the power frequency for durations of 0.5 cycle to 1 min.

**SWELL**

A temporary increase in the rms value of the voltage of more than 10percent of the nominal voltage, at the power frequency, for durations from 0.5 cycle to 1 min.

**Total Demand Distortion (TDD)**

The ratio of the root mean square of the harmonic current to the rms value of the rated or maximum demand fundamental current, expressed as a percent.

### **Total Disturbance Level**

The level of a given electromagnetic disturbance caused by the superposition of the emission of all pieces of equipment in a given system.

### **Total Harmonic Distortion (THD)**

The ratio of the root mean square of the harmonic content to the rms value of the fundamental quantity, expressed as a percent of the fundamental.

### **Transient**

Pertaining to or designating a phenomenon or a quantity that varies between two consecutive steady states during a time interval that is short compared to the time scale of interest. A transient can be a unidirectional impulse of either polarity or a damped oscillatory wave with the first peak occurring in either polarity.

### **Triplen Harmonics**

A term frequently used to refer to the odd multiples of the third harmonic, which deserve special attention because of their natural tendency to be zero sequence.

### **Undervoltage**

When used to describe a specific type of long-duration variation, refers to a measured voltage having a value at least 10 percent below the nominal voltage for a period of time greater than 1 min. In other contexts, such as distributed generation protection, the time frame of interest would be measured in cycles or seconds.

### **Voltage Change**

A variation of the root mean square or peak value of a voltage between two consecutive levels sustained for definite but unspecified durations.

### **Voltage Fluctuation**

A series of voltage changes or a cyclical variation of the voltage envelope.

### **Voltage Imbalance (Unbalance)**

A condition in which the three-phase voltages differ in amplitude or are displaced from their normal 120 degree phase relationship or both. Frequently expressed as the ratio of the negative sequence or zero-sequence voltage to the positive-sequence voltage, in percent.

### **Voltage Interruption**

Disappearance of the supply voltage on one or more phases. Usually qualified by an additional term indicating the duration of the interruption (e.g., momentary, temporary, or sustained).

### **Voltage Regulation**

The degree of control or stability of the rms voltage at the load. Often specified in relation to other parameters, such as input-voltage changes, load changes, or Temperature changes.

### **Voltage Magnification**

The magnification of capacitor switching oscillatory transient voltage on the primary side by capacitors on the secondary side of a transformer.

### **Waveform Distortion**

A steady-state deviation from an ideal sine wave of power frequency principally characterized by the spectral content of the deviation.

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