

Power Event Classification (IEEE 1159 Classifications)

Transients:

Oscillatory	A sudden, non-power frequency change in the steady state condition of voltage, current or both, that includes both positive and negative polarity values.
Low Frequency	A transient with a primary frequency component less than 5 kHz and a duration from 0.3 ms to 50 ms.
Medium Frequency	A transient with a primary frequency between 5 and 500 kHz with duration measured in the tens of microseconds.
High Frequency	Oscillatory transients with a primary frequency greater than 500 kHz and a typical duration measured in microseconds.
Impulsive	A sudden, non-power frequency change in the steady state condition of voltage, current or both, that is unidirectional in polarity. Lightning is the most common cause of impulsive transients.

RMS Variations:

Sags	A decrease in the normal voltage supply level, typically to 90% or less of the nominal RMS level, but greater than 10% of the nominal.
Swells	Formerly called surge, an increase in the voltage level, usually to 110% of the nominal RMS voltage.

Interruptions

Sometimes called outages, interruptions occur when the supply voltage goes below 0% of nominal.

Overvoltage

Generally caused by load variations or switching, this long duration variation refers to a measured voltage having a value 10% -20% above the nominal voltage for a period of time greater than 1 minute.

Undervoltage

The result of events which are the reverse of the events that cause overvoltage, these long duration events are measured voltage with valued 10% -20% below the nominal voltage for a period of time greater than 1 minute.

Waveform Distortion:

Harmonics

Sinusoidal voltages or current having frequencies that are integer multiples of the frequency at which the supply system is designed to operate. Harmonic distortion exists due to the nonlinear characteristics of devices and loads on power systems.

Notching

A periodic voltage disturbance caused by the normal operation of power electronic devices when current is commutated from one phase to another.

DC Offset

The presence of a dc voltage or current in an ac power system.

Interharmonics	Voltages or currents having frequency components that are non integer multiples of the frequency at which the supply system is designed to operate.
Noise	Unwanted electrical signals with broadband spectral content lower than 200 kHz superimposed upon the power system voltage or current in phase conductors, or found on neutral conductors or signal lines.
Power Frequency Variations	The deviation of the power system fundamental frequency from its specified nominal value.
Voltage Fluctuation (flicker)	Impression of unsteadiness of visual sensation induced by a light stimulus whose luminance or spectral distribution fluctuates with time.
Voltage Imbalance	A condition in which the three phase voltages differ in amplitude or are displaced from their normal 120 degree phase relationship or both.