High Voltage Glossary

Annotated Glossary of High Voltage Related Terms

For a more extensive listing see the *Handbook of Standardized Terminology for the Power Sources Industry* (2nd Edition), from the Power Sources Manufacturers Association. See also *The Authoritative Dictionary of IEEE Standards Terms*, Seventh Edition from the IEEE.

ARC: A disruptive discharge of electricity through an insulator, typically a gas, normally characterized by a voltage drop. This can be a single event, intermittent or continuous. Same as Flashover.

BREAKDOWN VOLTAGE: The voltage level which causes insulation failure. Same as Dielectric Withstand Voltage.

CORONA: A luminous discharge due to the ionization of the gas surrounding a conductor caused by a voltage gradient exceeding a certain critical value. It does not greatly heat the conductor, and it is limited to the region surrounding the conductor. While corona is a low energy process, over long periods of time, it can degrade insulators, causing a system to fail due to dielectric breakdown.

CORONA EXTINCTION VOLTAGE: The highest voltage at which continuous corona of specified pulse amplitude no longer occurs as the applied voltage is gradually decreased from above the corona inception value.

CORONA INCEPTION VOLTAGE: The lowest voltage at which continuous corona of specified pulse amplitude occurs as the applied voltage is gradually increased.

CREEPAGE: Current flowing between two conductors along a surface that is in contact with both conductors. Generally this can be neglected up until the voltage where corona or flashover occurs.

CREEPAGE DISTANCE: The shortest distance separating two conductors as measured along the surface touching both conductors. Along the surface of most materials, flashover can occur at distances much shorter than the flashover distance in air. Therefore, it is extremely important in high voltage designs to look for places where creepage can occur.

DIELECTRIC: An insulating material between two conductors.

DIELECTRIC WITHSTANDING VOLTAGE or DIELECTRIC WITHSTAND VOLTAGE: Voltage an insulating material will withstand before flashover (arcing) or puncture. Same as Breakdown Voltage. This is a greater value than working voltage. The difference depends on how much design margin the designer wants between the failure point and the operating point.

FLASHOVER: A disruptive discharge of electricity through an insulator, normally characterized by a voltage drop. Also, a discharge around or over a liquid or solid material. This can be a single event, intermittent or continuous. Same as Arc.

HI-POT TEST: A test performed by applying a dc or ac high voltage for a specified time to

determine adequacy of insulating materials in an assembly. Short for high potential test.

HIGH VOLTAGE: High voltage starts at the point where designers have to consider additional technical issues, and where there are significantly fewer component suppliers to choose from.

ISOLATION: The electrical separation between two conductors or two circuits.

ISOLATION VOLTAGE: The maximum dc or ac voltage that may be continuously applied between two isolated conductors or two circuits.

PRIMARY CIRCUIT: A circuit electrically connected to the input or source of power to the device. See also Secondary Circuit.

SAFETY GROUND: A conductive path to earth that is designed to protect persons from electrical shock by shunting away any dangerous currents that might occur due to malfunction or accident.

SECONDARY CIRCUIT: A circuit that is electrically isolated from the input or source of power to the device. See also Primary Circuit.

STANDOFF: A mechanical support insulator used to support a wire or component away from its mounting surface.

TRACKING: Marks made on a surface that experienced flashover.

WITHSTAND VOLTAGE: See Dielectric Withstand Voltage.

WORKING VOLTAGE: The specified or actual operating voltage applied between two conductors, circuits or a component.