

**Contact Voltage:** A voltage resulting from abnormal power system conditions that may be present between two conductive surfaces that can be simultaneously contacted by members of the general public and/or their animals. Contact voltage is caused by power system fault current as it flows through the impedance of available fault current pathways. Contact voltage is not related to normal system operation and can exist at levels that may be hazardous. (See also Stray Voltage)

Note: "Conductive surfaces" as used in this definition are intended to include the earth and/or extensions of the earth such as concrete sidewalks and metal floor drains.

Discussion:

A voltage resulting from abnormal power system conditions

A statement that clearly indicates "contact voltage" is not the norm, and only occurs when something is wrong. Use of the term "power system" necessarily includes faults from all possible sources (i.e. T-lines, distribution, and secondary wiring). IEEE 100 states:

**power system (1) (generating stations electric power system)**

The electric power sources, conductors, and equipment required to supply electric power. (PE/EDPG) 505-1977r

...that may be present between two conductive surfaces that can be simultaneously contacted....

As with "stray voltage", the **possibility of exposure** must exist before we call it "contact voltage". The instruments we use to first sense this potentially hazardous voltage (e.g. proximity detector), the instruments we use to determine if the voltage present has a low enough source impedance to be problematic, and the protocol we use to determine what action should result, are all topics that should be covered in the guide.

....by members of the general public and/or their animals.

As with "stray voltage" this is not about inaccessible substation touch and step potentials that may occur under fault conditions, it's about the possibility of the general public and/or their animals unknowingly placing themselves in a potentially lethal fault current path.

Contact voltage is caused by power system fault current as it flows through the impedance of available fault current pathways.

The voltage we are trying to define (i.e. contact voltage) is only present when a power system fault exists (e.g. compromised insulation). The fault may be a very high impedance fault with very little fault current actually flowing, but it is still a fault, and still capable of creating measurable voltage between conductive surfaces that people or their animals may contact. This is true regardless of the type of power system (e.g. grounded, un-grounded, etc.). Clearly both the level of contact voltage and the amount of fault current will change when a person or animal makes contact, but this guide should be about the detection, evaluation, and mitigation necessary to avoid a potentially lethal exposure.

Contact voltage is not related to normal system operation and can exist at levels that may be hazardous. (See also Stray Voltage)

As with "stray voltage" this statement is added to distinguish a potentially lethal exposure to "contact voltage" from the nuisance of "stray voltage" exposure.

Note: "Conductive surfaces" as used in this definition are intended to include the earth and/or extensions of the earth such as concrete sidewalks and metal floor drains.

This note is added to provide clarification that contact voltage can exist between any conductive surface and the earth, or between two points on the earth.