



Role of IEEE

There are several IEEE surge standards in section C62. These address suppression components, outline surge environments, and offer guidance based on the collective input of hundreds of surge suppression professionals.

The most commonly referenced IEEE surge standards are known as the Trilogy:

- IEEE C62.41.1 - 2002
- IEEE C62.41.2 - 2002
- IEEE C62.45 - 2002

These replaced ANSI/IEEE C62.41 – 1991 and ANSI/IEEE C62.45 – 1992.

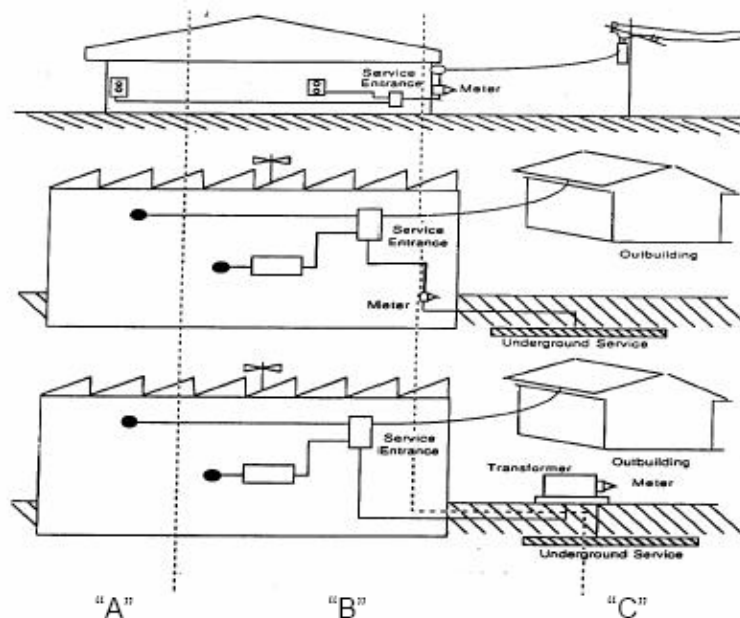
IEEE C62.41.1 - 2002 (Rev. of IEEE C62.41-1991 and C62.41-1980) Guide on the Surge Environment in Low-Voltage (1000V and Less) AC Power Circuits

- This document is a comprehensive collection of historical research and data concerning transients, energy levels, lightning, occurrence rates, related databases, etc. It outlines definitions, temporary over voltages (TOVs), isokeraunic maps and addresses physical limitations due to sparkover of clearances. It is 163 pages of data leading to Recommended Practices addressed in C62.41.2. This document includes an outstanding bibliography section.

IEEE C62.41.2 - 2002 (Rev. of IEEE C62.41-1991 and C62.41-1980) Recommended Practice on Characterization of Surges in Low-Voltage (1000V and Less) AC Power Circuits

- This document describes surges in low voltage AC power circuits (120V RMS through 1000 V RMS) and provides a set of representative surge waveforms. This document is full of practical information. It describes typical surge environments based on location within the building, power line impedance to the surge, and total wire length. Other parameters include proximity and type of electrical loads, wiring quality, and geographic location.
- Cost effective surge protection is best achieved through the application of protective devices matched to the environment and to the sensitivities of the equipment.
- The document describes typical surge environments and does not represent a performance test. The waveforms reflect typical environment conditions and provide a menu from which equipment designers can choose for a given application. Any statement that a protector meets the requirement of, or is certified to this document is inappropriate.

- Environmental conditions can be represented by two selected voltage/current wave forms:
 1. 0.5 microsecond/100kHz ringwave
 2. 1.2x50/8x20 microsecond combination wave
- The amplitude and available energy of the standard waveforms are dependent upon the location within a facility. As shown in the following figure, locations are classified into three categories:
 - CATEGORY C: outdoor overhead lines, service entrance (most severe)
 - CATEGORY B: major feeder, short branch circuits, service panel (indoor)
 - CATEGORY A: long branch circuits, receptacles (indoor) (least severe)



IEEE C62.45 - 2002 (Rev. of IEEE C62.45-1992)

Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits

- This document provides appropriate surge testing guidelines for equipment survivability, methods of test connection, surge coupling mode definitions, testing safety requirements, and various theories of surge suppression techniques. The intent is to provide background that can help determine whether equipment or circuit has adequate “withstand” capability.
 - An important objective of the document is to call attention to the safety aspects of surge testing.
 - Signal and data lines are not addressed in this document.

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