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IEEE Standards

# C62.48™

## IEEE Guide on Interactions Between Power System Disturbances and Surge-Protective Devices

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**IEEE Power Engineering Society**

Sponsored by the  
Surge Protectors Device Committee



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# IEEE Guide on Interactions Between Power System Disturbances and Surge-Protective Devices

Sponsor

**Surge Protectors Device Committee**  
of the  
**IEEE Power Engineering Society**

Approved 28 October 2005

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Approved 9 June 2005

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**Abstract:** Information is provided to users and manufacturers of surge-protective devices (SPDs) about the interactions that can occur between SPDs and power system disturbances. This guide applies to SPDs manufactured to be connected to 50 Hz or 60 Hz ac power circuits rated at 100–1000 V rms. The effects of the presence and operation of SPDs on the quality of power available to the connected loads are described. The interaction between multiple SPDs on the same circuit is also described.

**Keywords:** harmonics, noise, power system disturbance, surge-protective device (SPD), swell, voltage sag, voltage surge

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# Introduction

This introduction is not part of IEEE Std C62.48-2005, IEEE Guide on Interactions Between Power System Disturbances and Surge-Protective Devices.

The purpose of this guide is to provide users and manufacturers of surge-protective devices (SPDs) with an understanding of the nature of power system disturbances and SPDs, and of the interactions that can occur between them and between SPDs. Given this understanding, users will be able to take steps to either prevent or mitigate adverse effects of such interactions.

The growth of interest in low-voltage SPDs parallels the increasing number of applications of highly sophisticated electronic equipment that can be exposed and susceptible to surge voltages. Users of SPDs can sometimes be under the impression, or can be led to believe, that by installing an SPD in their facility or within their equipment, they will provide total immunity to any and all power system disturbances. In reality, SPDs will respond to and affect some power system disturbances. The effects that SPDs will have on power system disturbances are often less than desired. SPDs installed at various locations in the wiring systems as well as in equipment can interact with those wiring systems and with each other. In this scenario, the effect of any given SPD is imprecise and predictable only within wide limits. Proper application of SPDs will eliminate or reduce the effects of these disturbances for which it was designed. The use of SPDs is covered in other IEEE C62™ family documents.

The SPDs discussed herein are intended to limit transient overvoltages that can appear in low-voltage ac power systems having service voltages of 1000 V or less.

This guide is a member of the IEEE C62 family that deals with power system surges and surge protection. IEEE Std C62.41.2™-2002 characterizes and provides information on surge voltages in low-voltage ac power circuits. Other IEEE C62 documents describe performance characteristics of SPDs, recommend standard test protocols for verifying SPD performance, and provide SPD applications guidance.

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