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IEEE Guide for the Application of Low-Voltage (1000 V rms or Less) Surge Protective Devices Used on Secondary Distribution Systems (Between the Transformer Low-Voltage Terminals and the Line Side of the Service Equipment)

IEEE Power and Energy Society

Sponsored by the
Surge Protective Devices Committee

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Abstract: This guide encompasses the application of surge protective devices (secondary arresters) from the secondary terminals of the distribution transformer to the line side of the service equipment.

Keywords: Surge protective device, secondary arrester

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Introduction

This introduction is not part of IEEE Std C62.44–201615.3, IEEE Guide for the Application of Low-Voltage (1000 V rms or Less) Surge Protective Devices Used on Secondary Distribution Systems (Between the Transformer Low-Voltage Terminals and the Line Side of the Service Equipment).

Surge protective devices (SPDs) installed between the transformer low-voltage terminals (1000 V rms or less) and the line side of the service equipment are also known to many electric utility personnel as secondary arresters. This installation location falls within the Location Category C or IEEE Std C62.41.1™, and therefore these SPDs are exposed to greater surge currents than are expected in Category A and B locations. The international community refers to these SPDs as SPDs tested to Class 1 Tests. Additionally, secondary arresters that are listed to ANSI/UL 1449 are referred to as Type 1 SPDs.

IEEE Std C62.34™ covers test and performance specifications for SPDs intended to be installed on the line side of the service equipment and is intended to be used in conjunction with this guide. IEEE Std C62.62™ and IEEE Std C62.72™ cover the test specifications and application of SPDs to the load side of the service equipment.

Secondary arresters have been used since the early 1940s to protect the secondary winding of distribution transformers, kilowatt hour meters, and power equipment loads downstream from breakdown of insulation during nearby lightning strikes. Over the years, these SPDs have evolved tremendously due to technological advances in non-linear and semiconducting materials. With the advancement of SPD technology, these devices have become more robust in surge current handling capability and more precise in voltage protection level and repeatability. Henceforth, this guide is intended to help experienced professionals better understand the use and application of this type of SPD. Performance, testing, and surge environment criteria for secondary arresters are included in the References clause and Bibliography.

The standards developers have attempted, as far as possible, to harmonize with relevant international standards.

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IEEE Guide for the Application of Low-Voltage (1000 V rms or Less) Surge Protective Devices Used on Secondary Distribution Systems (Between the Transformer Low-Voltage Terminals and the Line Side of the Service Equipment)

1. Overview

1.1 Scope

This guide encompasses the application of surge protective devices (SPDs) (secondary arresters) from the secondary terminals of the distribution transformer to the line side of the service equipment.

NOTE—For reference, Figure 1 shows that the location covered by this guide is within Category C (from C62.41.1™).[1] The service entrance equipment includes all terminals and busses in the enclosure, and connection made to those terminals or busses with conductors other than load-carrying conductors. SPDs limit transient [surge] overvoltages by diverting surge currents. SPD coordination considers the power system characteristics, the equipment to be protected, and the location of the SPDs. This guide also provides an annex that presents information on risk factors.[2]

[1]Information on references can be found in Clause 2.
[2]Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

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