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IEEE Trial-Use Recommended Practice for Voltage Sag and Short Interruption Ride-Through Testing for End-Use Electrical Equipment Rated Less than 1000 V

IEEE Industry Applications Society

Sponsored by the
Power Systems Engineering Committee

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IEEE Std 1668™-2014

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IEEE-SA Standards Board

Grateful Acknowledgment

The following material from CIGRE Working Group C4.1 10 Final Report, Voltage Dip Immunity of Equipment and Installations, April 2010 is reprinted with permission:

Table 7, adapted from Table 6-5 page 185 of CIGRE report

Figure 19, adapted from 6-6 page 145 and Fig 6-35 page 160 of CIGRE report

Table 8, adapted from Fig 2-17 page 40, and from Table 4.1 page IO1 of CIGRE report

Table 9, from un-numbered table on page 35 of CIGRE report

Figure 20 adapted from Table 4.2, Page 102 of CIGRE report

Figure 21 adapted from Table 4.1 on page 101 of CIGRE report and Table 4.2 and Table 4.3 on page 104 of CIGRE report

Table A.1 adapted from Table 4.1 on page 101 of CIGRE report and Table 4.2 and Table 4.3 on page 104 of CIGRE report

Abstract: A trial-use, non-industry-specific recommended practice for voltage sag and short interruption ride-through performance and compliance testing of all electrical and electronic equipment connected to low-voltage power systems that can experience malfunction or shutdown as a result of reductions in supply voltage lasting less than one minute is detailed in this document. Testing procedures and requirements for test equipment are clearly defined within this document to reflect this electrical environment, including single-phase, two-phase, and three-phase balanced and unbalanced voltage sags. Requirements for certification and test reporting, including characterization of voltage-sag ride-through equipment are also defined.

Keywords: equipment testing, IEEE 1668™, immunity, power quality, ride-through, voltage dip, voltage sag, voltage-sag characteristics

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Participants

At the time this IEEE trial-use recommended practice was completed, the Voltage Sag Ride-through Working Group had the following membership:

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Introduction

This introduction is not part of IEEE Std 1668™-2014, IEEE Trial-Use Recommended Practice for Voltage Sag and Short Interruption Ride-Through Testing for End-Use Electrical Equipment Rated Less than 1000 V.

IEEE Std 1668-2014 is a non-industry specific trial use recommended practice for voltage-sag ride-through performance and compliance testing for all electrical and electronic equipment connected to low-voltage power systems that can experience malfunction or shutdown as a result of reductions in supply voltage lasting less than one minute. The recommended practice includes defining minimum voltage-sag immunity requirements based on actual voltage-sag data. A clause dedicated to the detailed analysis of voltage sags experienced by end users provides insight into real-world voltage sags. Testing procedures and test equipment requirements are clearly defined within this document to reflect this electrical environment, including single-phase, two-phase, and three-phase balanced and unbalanced voltage sags. This recommended practice also defines certification and test reporting requirements, including voltage-sag ride-through equipment characterization.

Contents

IEEE Trial-Use Recommended Practice for Voltage Sag and Short Interruption Ride-Through Testing for End-Use Electrical Equipment Rated Less than 1000 V

1. Overview

1.1 Scope

This document is a non-industry-specific recommended practice for voltage-sag ride-through performance and compliance testing for all electrical and electronic equipment connected to low-voltage power systems (with nominal/rated voltage less than 1000 V) that can experience malfunction or shutdown as a result of reductions in supply voltage lasting less than one minute. The recommended practice includes defining minimum voltage-sag immunity requirements based on actual voltage-sag data. A clause dedicated to the detailed analysis of voltage sags experienced by end users provides insight into real-world voltage sags. Testing procedures and requirements for test equipment are clearly defined within this document to reflect the electrical environment, including single-phase, two-phase, and three-phase, balanced and unbalanced voltage sags. The recommended practice also defines requirements for certification and test reporting, including characterization of voltage-sag ride-through equipment.