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IEEE Guide for Fault Current Limiter (FCL) Testing of FCLs Rated above 1000 V AC

IEEE Power and Energy Society

Sponsored by the
Switchgear Committee

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IEEE Guide for Fault Current Limiter (FCL) Testing of FCLs Rated above 1000 V AC

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Abstract: The testing of fault current limiters (FCLs) operating on condition-based impedance increase for AC systems 1000 V and above is described in this guide. Constant impedance series reactors and single fuses are not included in this guide.

Keywords: asymmetrical short-circuit current, continuous current, electromagnetic compatibility, FCL testing, IEEE C37.302™, insertion impedance, insulation resistance, inter-turns insulation, lightning impulse/BIL, lightning impulse voltage, loss measurement, partial discharge, peak withstand current, power frequency voltage withstand, recovery, short-circuit current limitation, short-time withstand current, temperature rise.

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Introduction

This introduction is not part of IEEE Std C37.302-2015, IEEE Guide for Fault Current Limiter (FCL) Testing of FCLs Rated above 1000 V AC.

Significant developments in the area of fault current limiters (FCLs) operating on the principle of condition-based impedance increase have resulted in products emerging on the market in the last decade. There are, however, no guidelines on how to test these new FCL technologies. Therefore, in June 2010 the IEEE Switchgear Committee established WG PC37.302 to develop such a guide.

This Working Group was co-sponsored by the IEEE Power and Energy Society/Substations (PE/SUB) and the IEEE Power Electronics Society/Standards Committee (PEL/SC). This guide takes a technology-independent black-box approach and intentionally avoids stating any performance criteria. It provides, however, a newly developed set of parameters (not values) to fully describe the behavior of any FCL for testing purposes. Overall, this guide has been written to inform the stakeholder community about all the aspects of testing FCLs.

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IEEE Guide for Fault Current Limiter (FCL) Testing of FCLs Rated above 1000 V AC

1. Overview

1.1 Scope

This guide describes the testing of fault current limiters (FCLs) operating on condition-based impedance increase for AC systems 1000 V and above. This guide does not include constant impedance series reactors and single fuses. (For standards specific to these fault current limiting devices, see IEEE Std C57.16™[1,2,3] and IEEE Std C37.46™ [B14][4]).

NOTE—Testing of FCL load current interrupting capabilities are not addressed in this guide and may be discussed between user and manufacturer.[5]

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