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551™

IEEE Recommended Practice for

Calculating Short-Circuit Currents in Industrial and Commercial Power Systems

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Abstract: This recommended practice provides short-circuit current information including calculated short-circuit current duties for the application in industrial plants and commercial buildings, at all power system voltages, of power system equipment that senses, carries, or interrupts short-circuit currents. Equipment coverage includes, but should not be limited to, protective device sensors such as series trips and relays, passive equipment that may carry short-circuit current such as bus, cable, reactors and transformers as well as interrupters such as circuit breakers and fuses.
Keywords: available fault current, circuit breaker, circuit breaker applications, fuse, power system voltage, reactors, short-circuit applications guides, short-circuit duties

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Introduction

This introduction is not part of IEEE Std 551-2006, IEEE Recommended Practice for Calculating Short-Circuit Currents in Industrial and Commercial Power Systems.

This recommended practice is intended as a practical, general treatise for engineers on the subject of ac short-circuit currents in electrical power systems. The focus of this standard is the understanding and application of analytical techniques of short-circuit analysis in industrial and commercial power systems. However, the same engineering principles apply to all electrical power systems, including utilities and systems other than 60 Hz.

More than any other book in the IEEE Color Book® series, the "Violet Book" covers the basics of short-circuit currents. To help the reader, the same one-line diagram that is used in several of the other color books is used in sample calculations. Items covered in the Violet Book that are not covered in the other color book chapters on short-circuit currents are the contributions of regenerative SCR drives and capacitors to faults. The reference data chapter in this recommended practice is quite extensive and should be very useful for any type of power system analysis.

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