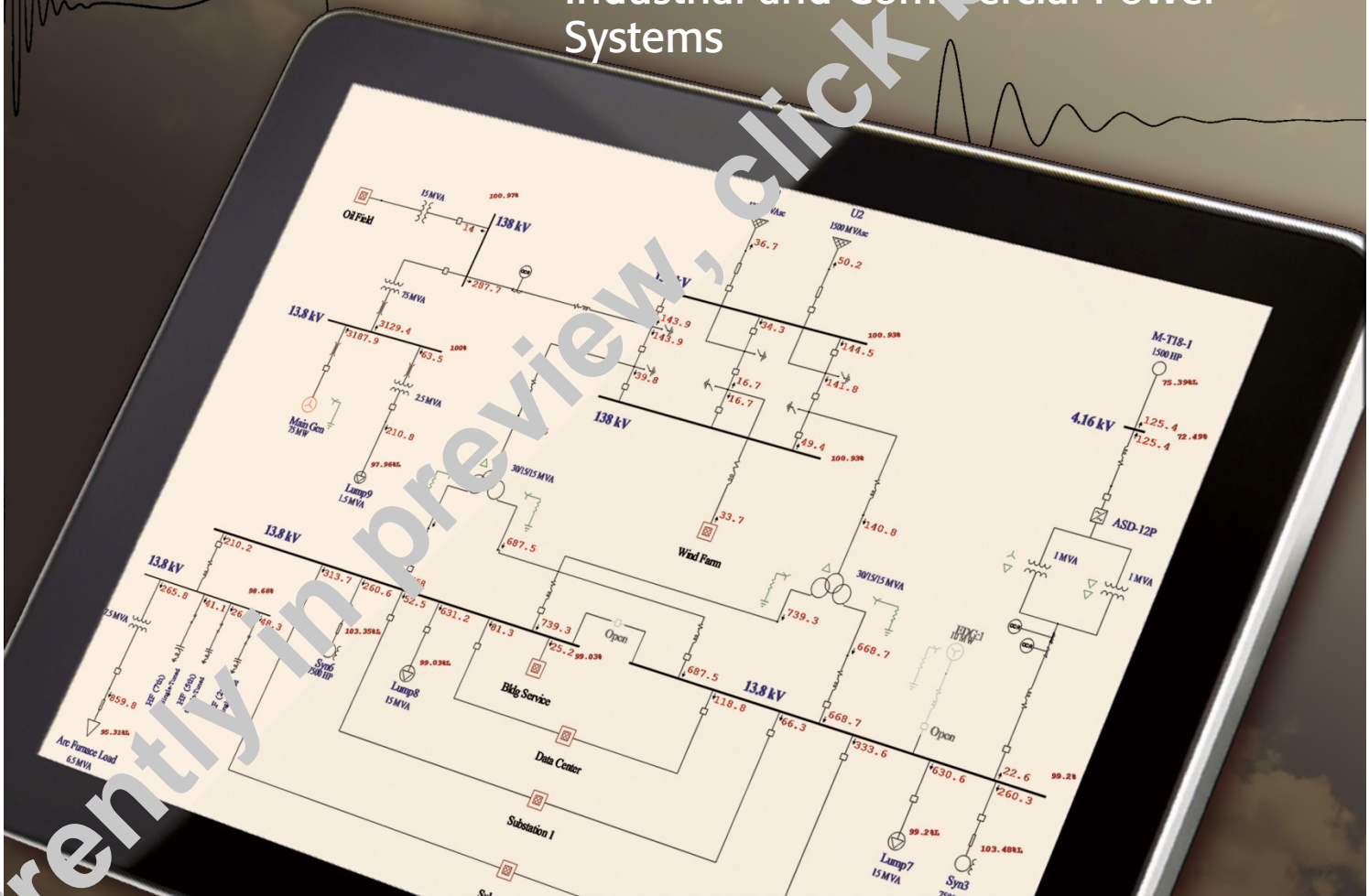


IEEE Std 3002.3™ - 2018

Recommended Practice for Conducting Short-Circuit Studies and Analysis of Industrial and Commercial Power Systems



IEEE Recommended Practice for Conducting Short-Circuit Studies and Analysis of Industrial and Commercial Power Systems

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Abstract: Activities related to short-circuit analysis, including design considerations for new systems, analytical studies for existing systems, as well as operational and model validation considerations for industrial and commercial power systems are addressed. Fault current calculation and device duty evaluation is included in short-circuit analysis. Accuracy of calculation results primarily relies on system modeling assumptions and methods used. The use of computer-aided analysis software with a list of desirable capabilities recommended to conduct a modern short-circuit study is emphasized. Examples of system data requirements and result analysis techniques are presented.

Keywords: ac decrement, asymmetrical fault current, available fault current, bolted fault, breaking capacity, breaking duty, data collection, dc component, dc decrement, dc offset, device duty calculation, fault calculation, fault duty, IEEE 3002.3, interrupting capacity, interrupting duty, making capacity, making duty, momentary capacity, momentary duty, short-circuit analysis, short-circuit current, short-circuit studies, short-circuit withstand, symmetrical component, symmetrical fault current, system modeling, system validation, X/R ratio

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- Protection and Coordination (3004 series)
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In many cases, the material in a dot standard comes from a particular chapter of a particular IEEE Color Book. In other cases, material from several IEEE Color Books has been combined into a new dot standard.

IEEE Std 3002.3™

The material in this recommended practice partially comes from IEEE Std 551™, IEEE Recommended Practice for Calculating AC Short-Circuit Currents in Industrial and Power Systems (*IEEE Violet Book™*) and IEEE Std 399™, IEEE Recommended Practice for Industrial and Commercial Power System Analysis.^{1, 2}

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IEEE Recommended Practice for Conducting Short-Circuit Studies and Analysis of Industrial and Commercial Power Systems

1. Scope

This recommended practice describes how to conduct short-circuit studies and analysis of industrial and commercial power systems. It is likely to be of greatest value to the power-oriented engineer with limited experience in this area.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ANSI/IEEE Std C37.5™, IEEE Guide for Calculation of Fault Currents for Application of AC High-Voltage Circuit Breakers Rated on a Total Current Basis.¹

IEC 60909, Short-circuit currents in three-phase a.c. systems.²

IEC 61363-1:1998, Electrical installations of ships and mobile and fixed offshore units—Part 1: Procedures for calculating short-circuit currents in three-phase a.c.

IEEE Std 141™, IEEE Recommended Practice for Electric Power Distribution for Industrial Plants (*IEEE Red Book™*).^{3, 4}

IEEE Std 241™, IEEE Recommended Practice for Electric Power Systems in Commercial Buildings (*IEEE Gray Book™*).

IEEE Std 242™, IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (*IEEE Buff Book™*).

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