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**IEEE 3001 STANDARDS:
POWER SYSTEMS DESIGN**

IEEE Std 3001.2™ -2017

Recommended Practice
for Evaluating the Electrical
Service Requirements of
Industrial and Commercial
Power Systems



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IEEE Recommended Practice for Evaluating the Electrical Service Requirements of Industrial and Commercial Power Systems

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Abstract: Commercial, institutional, and industrial design of electrical services, interconnecting with a utility distribution or transmission system is explored. The electrical system information needed by the designer concerning the utility's system characteristics, and the electrical load information needed by the utility to design a satisfactory electrical interface between the serving utility and the premise electrical distribution system is considered.

Keywords: electric rates, IEEE 3001.2, service, service entrance, substation, utility metering, utility billing, vaults

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When this project is completed, the technical material included in the 13 Color Books will be included in a series of new standards—the most significant of which will be a new book, IEEE Standard 3000™, IEEE Recommended Practice for the Engineering of Industrial and Commercial Power Systems. The new standard will cover the fundamentals of planning, design, analysis, construction, installation, start-up, operation, and maintenance of electrical systems in industrial and commercial facilities. Approximately 60 additional dot standards, organized into the following categories, will provide in-depth treatment of many of the topics introduced by IEEE Std 3000™:

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In many cases, the material in a “dot” standard comes from a particular chapter of a particular color book. In other cases, material from several color books has been combined into a new “dot” standard.

The material in this recommended practice largely comes from Chapter 2 and Chapter 15 of the *IEEE Red Book*™, IEEE Std 141™-1993, Recommended Practice for Electric Power Distribution in Industrial Plants, and Chapter 4 and Chapter 7 of the *IEEE Gray Book*™, IEEE Std 241™-1990.

IEEE Std 3001.2

This publication provides a recommended practice for the electrical design of commercial and industrial facilities. It is likely to be of greatest value to the power-oriented engineer with limited commercial or industrial plant experience. It can also be an aid to all engineers responsible for the electrical design of commercial and industrial facilities. However, it is not intended as a replacement for the many excellent engineering texts and handbooks commonly in use, nor is it detailed enough to be a design manual. It should be considered a guide and general reference on electrical design for commercial and industrial facilities.

Tables, charts, and other information that have been extracted from codes, standards, and other technical literature are included in this publication. Their inclusion is for illustrative purposes; where technical accuracy is important, the latest version of the referenced document should be consulted to assure use of complete, up-to-date, and accurate information.

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IEEE Recommended Practice for Evaluating the Electrical Service Requirements of Industrial and Commercial Power Systems

1. Scope

This recommended practice explores commercial, institutional, and industrial design of electrical services, interconnecting with a utility distribution or transmission system. Close coordination between the facility electrical designer and the serving utility are critical for a successful service connection. This recommended practice considers the electrical system information needed by the designer concerning the utility's system characteristics and the electrical load information needed by the utility to design a satisfactory electrical interface between the serving utility and the premise electrical distribution system. It describes various ways to take power from the serving utility. It also covers the specific requirements for utility metering on service entrance equipment, as well as service equipment rooms, vaults, and pads.

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.

Accredited Standards Committee C2™, National Electrical Safety Code® (NESC®).

IEC 61936-1-Ed.1.0, Power installations exceeding 1 kV ac—Part 1: Common Rules.¹

IEEE Std 80™, IEEE Guide for Safety in AC Substation Grounding.^{2,3}

IEEE Std 142™, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems (*IEEE Green Book™*).

IEEE Std 693™, IEEE Recommended Practice for Seismic Design of Substations.

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