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IEEE Recommended Practice for the Operation and Management of Industrial and Commercial Power Systems

IEEE Industry Applications Society

Sponsored by the
Technical Books Coordinating Committee

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IEEE Recommended Practice for the Operation and Management of Industrial and Commercial Power Systems

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Abstract: Recommended practices for the numerous personnel who are responsible for safely operating and managing industrial and commercial electric power facilities are provided. In this recommended practice, plant engineers are provided with a reference source for the fundamentals of safe and reliable operation and management of industrial and commercial electric power distribution systems.
Keywords: clearing procedures, coordination, documentation, electrical hazards, electrical maintenance, electrical safety program, grounding, inspection, maintenance, management, operating diagrams, operation, protective devices, record keeping, safety, single-line diagram, system control, testing

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Introduction

This introduction is not part of IEEE Std 3007.1-2010, IEEE Recommended Practice for the Operation and Management of Industrial and Commercial Power Systems.

This recommended practice was developed by the Technical Books Coordinating Committee of the Industrial and Commercial Power Systems Department of the IEEE Industry Applications Society, as part of a project to repackage the popular series of "IEEE Color Books." The goal of this project is to speed up the revision process, eliminate duplicate material, and facilitate the use of modern publishing and distribution technologies.

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 Std 3000, IEEE Recommended Practice for the Engineering of Industrial and Commercial Power Systems. The new book 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 to be introduced by IEEE Std 3000:

— Power Systems Design (3001 series)

— Power Systems Analysis (3002 series)

— Power Systems Grounding (3003 series)

— Protection and Coordination (3004 series)

— Emergency, Stand-By Power, and Energy Management Systems (3005 series)

— Power Systems Reliability (3006 series)

— Power Systems Maintenance, Operations, and Safety (3007 series)

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 purpose of this document is to provide guidance for the numerous personnel who are responsible for operating and managing industrial and commercial electric power facilities.

This recommended practice evolves from and built on the most recent revisions to the "operations" chapters (Chapter 2 through Chapter 4) of the 1998 edition of IEEE Std 902™, IEEE Guide for Maintenance, Operation, and Safety of Industrial and Commercial Power Systems (also known as the *IEEE Yellow Book*).[a] Prior to the Color Books reorganization process, the Yellow Book Working Group had completed a draft revision (March 2007) that was approaching readiness for publishing. Unfortunately, it was not completed prior to the reorganization process.

The original working groups for IEEE Std 902 were sponsored by the Industrial and Commercial Power Systems Engineering Committee of the IEEE Industry Applications Society through the Safety, Operations, and Maintenance Subcommittee. Work related to this document, IEEE Std 3007.1, is now reported to the Technical Books Coordinating Committee through the Power Systems Maintenance, Operations, and Safety Editorial Working Group.

Information on references can be found in Clause 2.

When the original IEEE Std 902 was contemplated and created, the requirements of the Occupational Safety and Health Act (OSHA, a U.S. law) and the limited information that were generally offered at the time were prime driving forces. Although some things have changed since then, the basic drivers and philosophies for maintenance, safety, and operation have remained relatively unchanged. The intent of this document is to provide up-to-date basic philosophies and approaches to problems without going into great detail on any one aspect of the subject. Where readers require more depth of information, references have been provided for further study.

The Working Group recognizes the international applicability of this guide. The Working Group also recognizes that this standard refers to some practices that are U.S. oriented. As a practical matter, the consensus was to publish this edition with the intent that international standards would supplement this guide as appropriate. The Working Group is committed to making this an international standard as far as input is provided for this recommended practice, as well as future editions.

Over the years, a great many people have contributed to the development of this recommended practice. The most recent working group participants are listed in the participants section of the front matter. To all others who may have contributed in some way or were former working group members that helped develop or work on IEEE Std 902, we would like to extend our gratitude and appreciation for your efforts.

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Participants

At the time this recommended practice was submitted to the IEEE-SA Standards Board for approval, the Maintenance, Operations and Safety (MOS) Working Group of the Technical Books Coordinating Committee of the Industrial and Commercial Power Systems Department of the Industry Applications Society had the following membership:

Dennis K. Neitzel, *Chair*

H. Landis Floyd	Robert J. Schuerger	Michael E. Simon
Erling Hesla		Ron Widup

At the time this recommended practice was submitted by the MOS Working Group to the IEEE-SA Standards Board for approval, the 3007.1 Working Group had the following membership:

Michael E. Simon, *Chair*

H. Landis Floyd	Kelly O'Donnell	Robert J. Schuerger
Erling Hesla	Giuseppe Parise	Marcelo Valdes
Ed [illegible]		Jim White

The following members of the individual balloting committee voted on this recommended practice. Balloters may have voted for approval, disapproval, or abstention.

William J. Ackerman
Michael Adams
Ali Al Awazi
John Barker
Michael Bayer
Robert Beavers
Kenneth Behrendt
W. J. (Bill) Bergman
Wallace Binder
William Braun
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Satish Aggarwal, *NRC Representative*
Richard DeBlasio, *DOE Representative*
Michael Janezic, *NIST Representative*

Lisa Perry
IEEE Standards Program Manager, Document Development

Patricia A. Gerdon
IEEE Standards Manager, Technical Program Development

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IEEE Recommended Practice for the Operation and Management of Industrial and Commercial Power Systems

1. Overview

1.1 Scope

This recommended practice covers the operation and management of industrial and commercial power systems. It covers the fundamental elements of system operation including, but not limited to, proper documentation, system management, control responsibilities, and clearing procedures.

1.2 General

Even with the best design and equipment, the expected safe and reliable performance of a power system is largely dependent upon the quality and capability of its operation and management. Optimizing system operation through proper management can often be one of the most cost-effective approaches in improving system performance.

The phrase "industrial and commercial power systems" covers a broad spectrum. At one end of this spectrum is the large industrial complex that can justify a staff of highly skilled and knowledgeable maintenance and operation personnel. At the other end of this spectrum is the small simple system in which the owner may have little or no electrical expertise.