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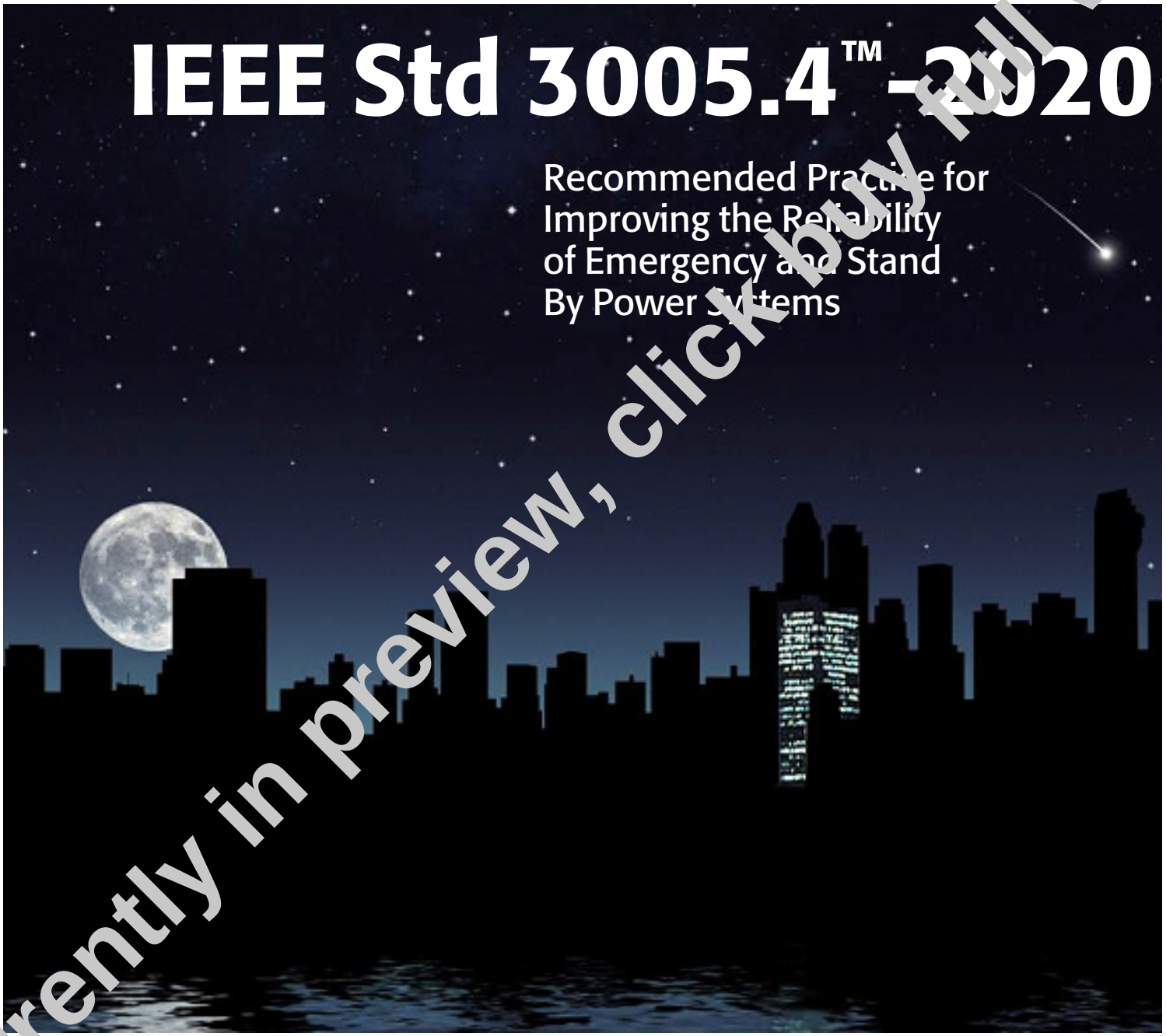
Recommended Practice for
Improving the Reliability
of Emergency and Stand
By Power Systems



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IEEE Recommended Practice for Improving the Reliability of Emergency and Stand By Power Systems

Sponsor

Industrial and Commercial Power Systems Standards Development Committee
of the
IEEE Industry Applications Society

Approved 4 June 2020

IEEE SA Standards Board

Abstract: Described in this recommended practice are methods for improving the reliability of emergency and stand by power systems. Some of the factors examined include the specific application of the emergency or stand by equipment, environmental concerns, specification and acceptance testing of the equipment, and the operations and maintenance of the equipment.

Keywords: emergency power, commissioning, generator testing, IEEE 3005.4, industrial and commercial power systems, reliability, stand by power

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The Working Group would like to recognize the following individuals who were active early in the process of developing this recommended practice and thank them for their invaluable contributions to the initial draft document that served as the basis of our work:

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Introduction

This introduction is not part of IEEE Std 3005.4–2020, IEEE Recommended Practice for Improving the Reliability of Emergency and Stand By Power Systems.

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When this project is completed, the technical material included in the 13 "color books" will be included in series of new standards. Approximately 60 additional "dot" standards, organized into the following categories, will provide in-depth treatment of many of the topics formerly covered in the color books:

— 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 material in this recommended practice largely comes from IEEE Std 446-1995, IEEE Recommended Practice for Emergency and Stand-By Power Systems for Industrial and Commercial Applications (*IEEE Orange Book*™).

IEEE Std 3005.4™

The objective of this recommended practice is to provide guidance for improving the reliability of emergency and stand by power systems through the application of the reliability principles described in the 3006 series of IEEE Recommended Practices on Power Systems Reliability. It includes summaries of applicable reliability data from other IEEE publications and discussion of its applicability to the design, testing, and maintenance practices of emergency and stand by power systems. Reliability considerations for auxiliary systems necessary to the supply of electric power, such as fuel supply and cooling, are also discussed.

Contents

IEEE Recommended Practice for Improving the Reliability of Emergency and Stand By Power Systems

1. Overview

1.1 Scope

This recommended practice describes how to improve the reliability of emergency and stand by power systems. Some of the factors examined include the specific application of the emergency or stand by equipment, environmental concerns, specification and acceptance testing of the equipment, and the operations and maintenance of the equipment.

1.2 Applicability

The terms *emergency* and *stand by* are often interchangeably applied to electric power systems whose function is to provide power to selected loads on interruption of their normal power source. This may include systems in which engines or turbines convert liquid or gaseous fuel to electric energy, as well as systems in which stored energy from batteries is the alternate power source. In some cases, the terms are not interchangeable. In the United States, for example, the National Electrical Code (NEC) [B18][1] classifies emergency and stand by systems separately based on the types of loads they supply. For the purposes of this recommended practice, no distinction is made between the two terms.

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/ASTM D975-92a, Specification for Diesel Fuel Oils.[2,3]

[1]The numbers in brackets correspond to those of the bibliography in Annex A.
[2]ANSI publications are available from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (https://www.ansi.org/).
[3]ASTM publications are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, USA (https://www.astm.org/).