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IEEE Recommended Practice for the Implementation of Inductive Coordination Mitigation Techniques and Application

IEEE Power and Energy Society

Sponsored by the
Power Systems Communications and Cybersecurity Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 1137™-2018
(Revision of IEEE Std 1137-1991)

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Approved 5 December 2018

IEEE-SA Standards Board

Abstract: Guidance for controlling or modifying the inductive environment and the susceptibility of affected wire line telecommunications facilities in order to operate within the acceptable levels of steady-state or surge induced voltages of the environmental interface (probe wire) defined by IEEE Std 776™ is provided in this Recommended Practice. Procedures for determining the source of the problem are given. Mitigation theory and philosophy are discussed, and mitigation devices are described. The application of typical mitigation apparatus are addressed. Advice for determining the best engineering solution is offered, and general safety considerations are discussed.

Keywords: coordination, coupling, harmonic, ICEP, IEEE 1137™, impedance, inductive, influence, mitigation, mutual, noise, power, susceptibility

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

PDF: ISBN 978-1-5044-5633-3 STD23592
Print: ISBN 978-1-5044-5629-6 STDPD23592

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Thomas Vo
Larry Young

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

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Bill Brown
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Demetrio Bucaneg Jr.
William Bush
William Byrd
Robert Christman
Gearold O. H. Eidhin
Kenneth Fodero
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Introduction

This introduction is not part of IEEE Std 1137™-2018, IEEE Recommended Practice for the Implementation of Inductive Coordination Mitigation Techniques and Application.

This document was suggested during the preparation of IEEE Std 776™-1987 as a companion in the area of implementing mitigating techniques. The following individuals made a significant contribution to the effort.

David Boneau	Harold Held	Dick Nelson
Chrys Chrysanthou	Ron Jones	Stan Overby
Russ Gundrum	Bill McCoy	Keith Sabine
	Charlie Nelson	

The Wire-Line Subcommittee issued, in 2009, a Corrigendum to correct errors in Table 3 and to correct typos in 8.5 of the printed 1991 edition. In 2017 the Wire-Line Subcommittee decided to revise this Guide and upgrade it to a Recommended Practice to include the changes made by the Corrigendum, and to bring the document in line with the latest IEEE-SA Style Manual and to further make minor editorial revisions to clarify the content.

Since many noise specialists and subject matter experts have either retired or left the telecommunications industry in the recent past, the revision to this Recommended Practice also includes Annex C with information on activities to be conducted on noise reduction investigations prior to implementing the procedures outlined in IEEE Std 776. The information contained in Annex C should be considered a handy reference for those persons that have replaced the specialists that have left or are new to the field of inductive coordination or noise investigations.

Contents

IEEE Recommended Practice for the Implementation of Inductive Coordination Mitigation Techniques and Application

1. Overview

1.1 Scope

This Recommended Practice offers users assistance in controlling or modifying the inductive environment and the susceptibility of affected wire-line telecommunications facilities in order to operate within the acceptable levels of steady-state or surge-induced voltages of the environmental interface (probe wire) defined by IEEE Std 776™.[1] The methodology, application, and evaluation of results for mitigative techniques or devices in general are addressed for all Specific Type A and Specific Type B coordination methods also defined by IEEE Std 776.

1.2 General

In IEEE Std 776, the recommended procedures for determining the source and type of inductive interference are explained. Detailed methods are provided to determine the cause and effect relationship by calculation or direct measurement on the probe wire interface. Tables are given to set the environmental thresholds for the initiation of inductive coordination.

This recommended practice examines the implementation of general and specific mitigation techniques. Note that long accepted practice suggests that both power and communications companies design, construct, operate, and maintain their respective systems utilizing general coordination methods, as defined in IEEE Std 776. Some of the mitigation devices and procedures that are defined as specific mitigation measures have been used by companies as economic tradeoffs against more expensive general coordination methods. This recommended practice neither recommends nor condemns this practice. IEEE Std 776 suggests that specific mitigation methods should not be employed as the best engineering solution until each company is employing general coordination methods. However, users of this recommended practice should note that implementation of any method or device should include the consideration of timeliness and economics irrespective of the system to which it is to be applied in order to meet each utility company's obligations to their mutual customers and regulatory bodies, as applicable.

[1]Information on references can be found in Clause 2.