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IEEE Emerald Book 1100 Std 2005 SPGS Credits

In the *1100™ 2005 IEEE Recommended Practice for Powering and Grounding Electronic Equipment* an SPGS employee was the chair person for *Chapter 9 Telecommunications, information technology, and distributed computing.* This project took over eighteen months to complete. SPGS spent many trips, donated expenses, hours and countless edits to complete Chapter 9. SPGS contributed many drawings and changes for Chapter 9; however SPGS only asked for the fifteen credits that IEEE placed in the final version.

These credits appear on page iii, page 371, page 392, page 393, page 396, page 397, page 398, page 400, page 401, page 410 and page 489.

SPGS was given credit by IEEE in the final revision for the following drawings.

Page 371

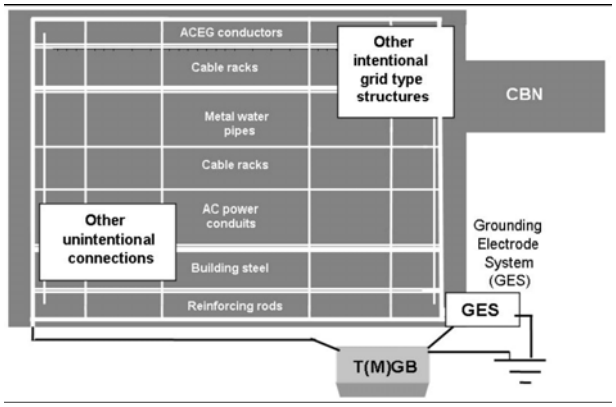

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Figure 9-36—The CBN connected to the T(M)GB that connects to the GES
Page 371

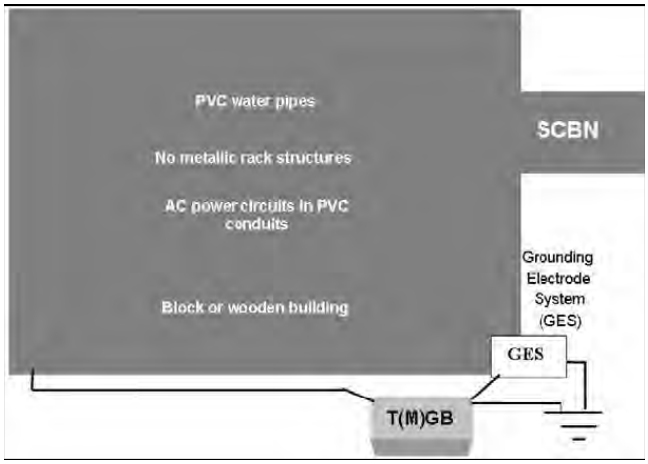

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Figure 9-37—SCBN—worst case

Page 392

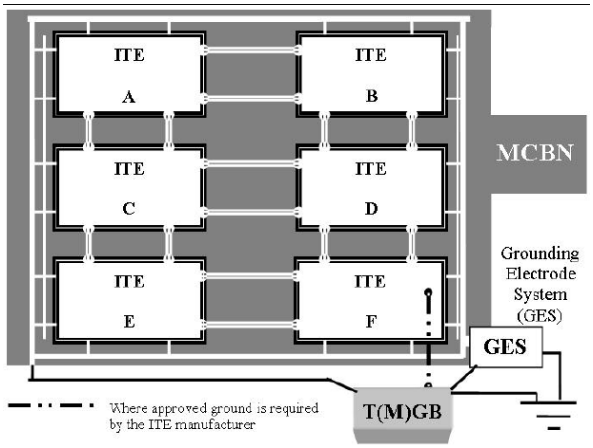

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Figure 9-49—MCBN

Page 392

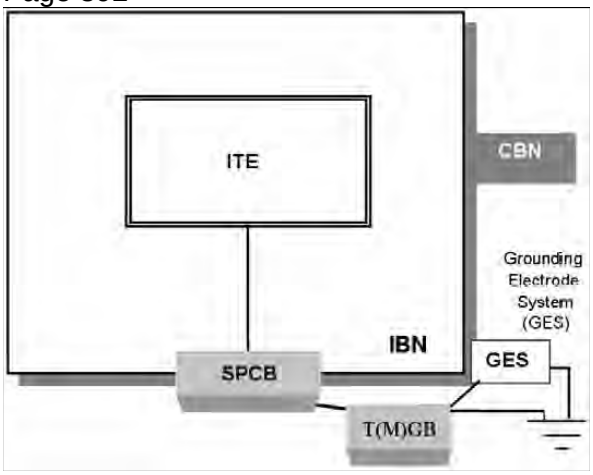

Figure 9-50—IBN

Page 393

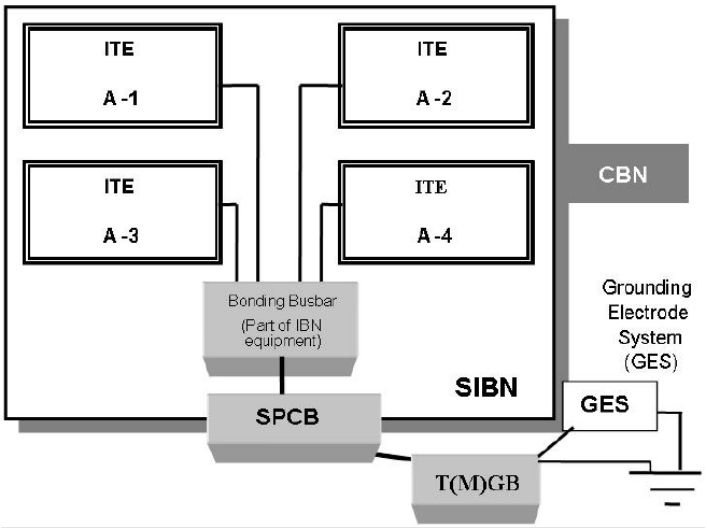

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Figure 9-51—SIBN

Page 393

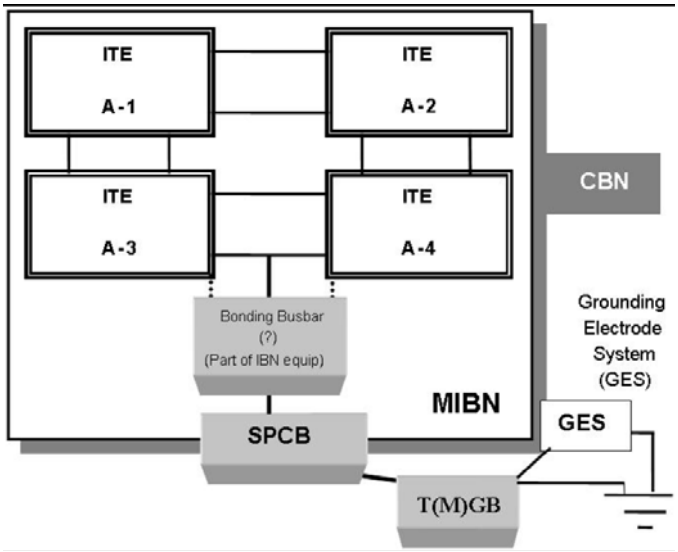

Figure 9-52—MIBN

Page 396

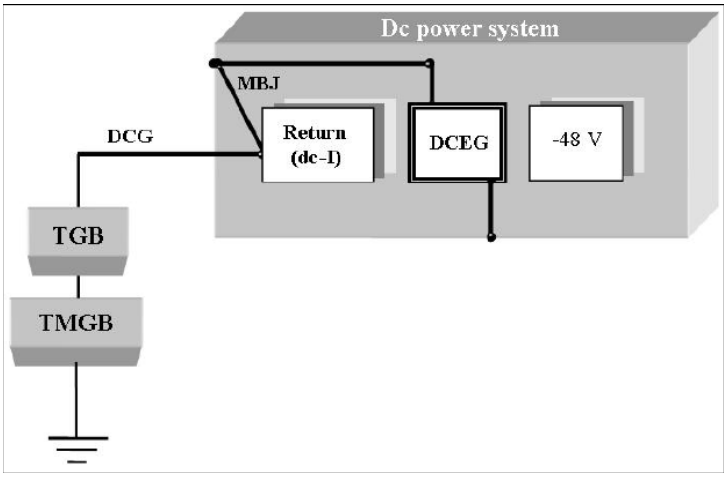

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Figure 9-54—DC power system with dc-I Return

Page 396

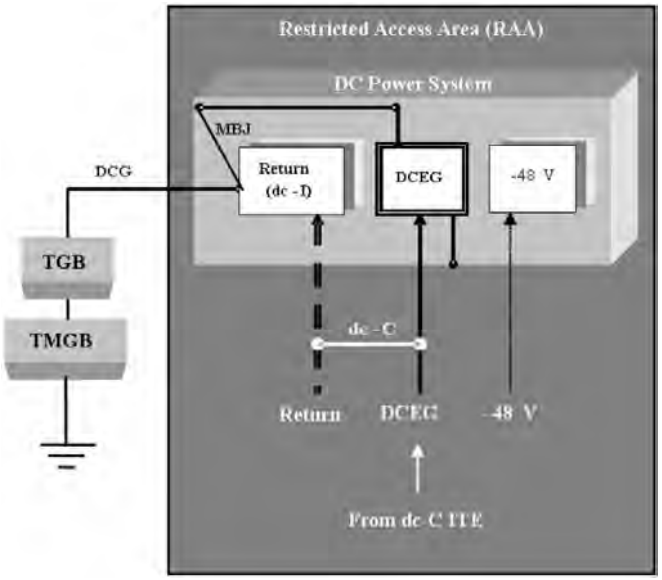

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Figure 9-55—Dc-I dc power system Return regrounded by dc-C ITE

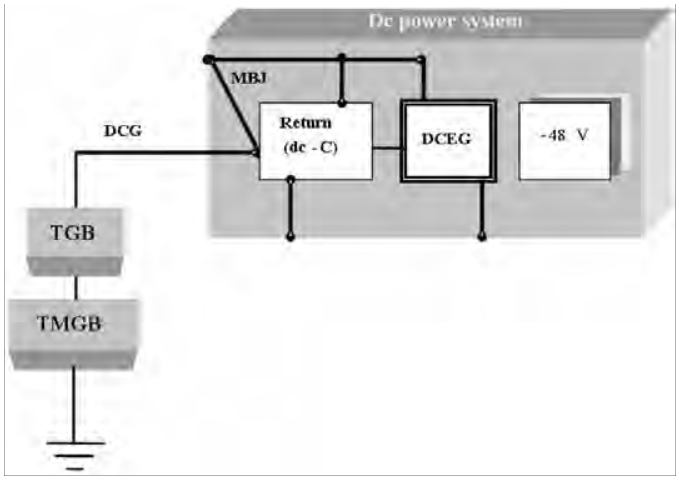

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Figure 9-56—DC power system with dc-C Return
Page 397

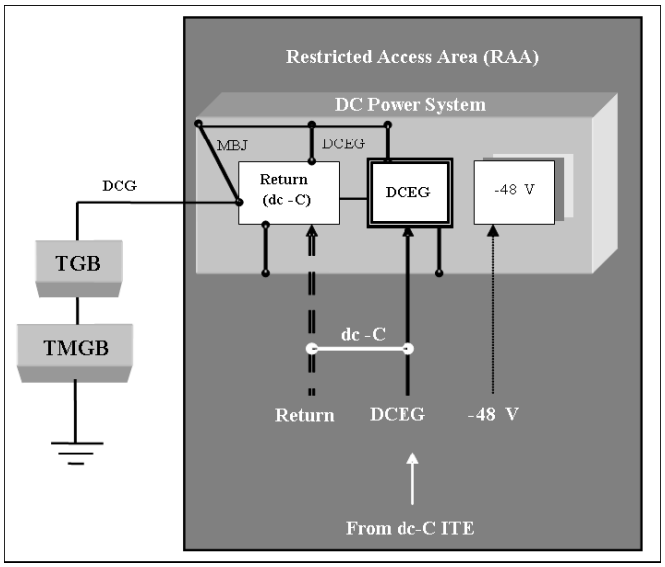

Figure 9-57—DC-C dc power system Return regrounded by dc-C ITE

Page 398

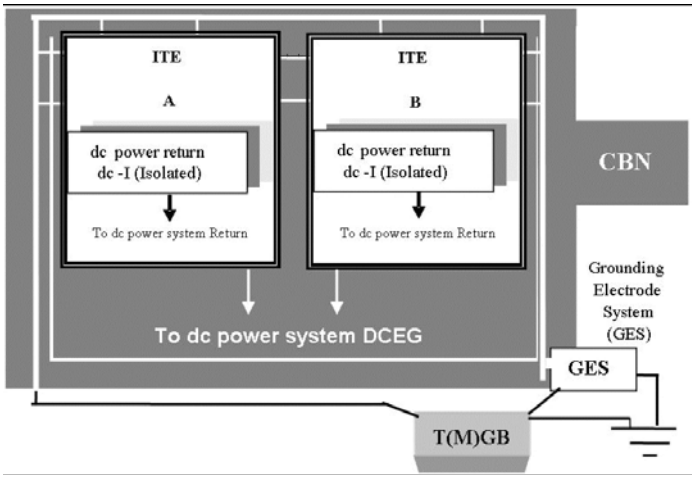

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Figure 9-58—ITE with dc-I Return and located in a CBN

Page 400

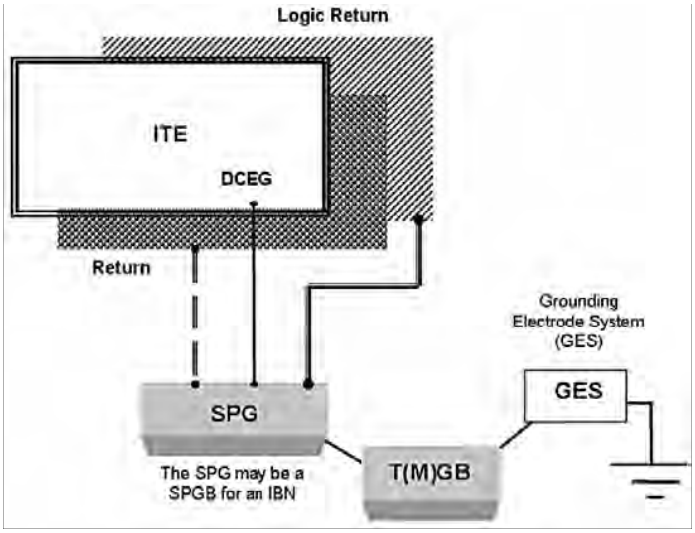

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Figure 9-61— ITE with each ground plane externally single-point grounded

Page 400

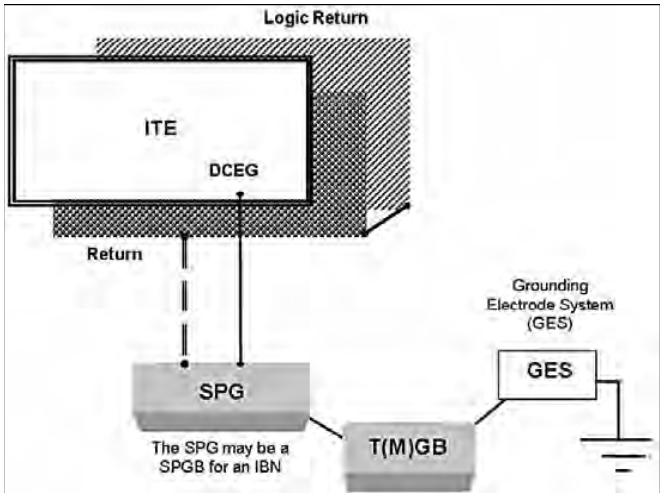

Figure 9-62—ITE with logic return internally grounded to the Return

Page 401

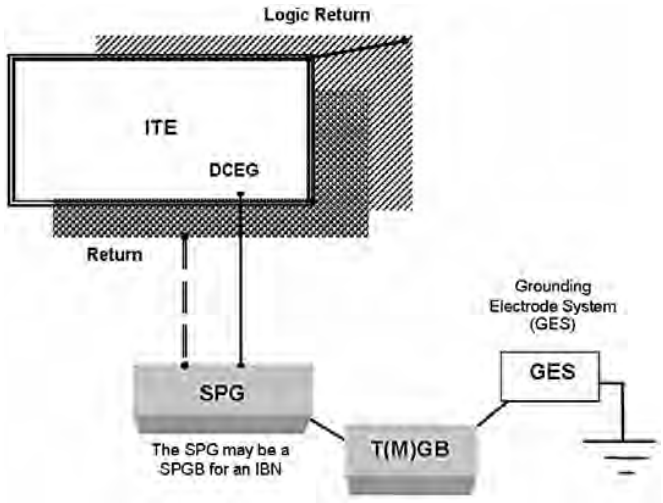

Figure 9-63— ITE with logic return internally grounded to the DCEG

Page 401

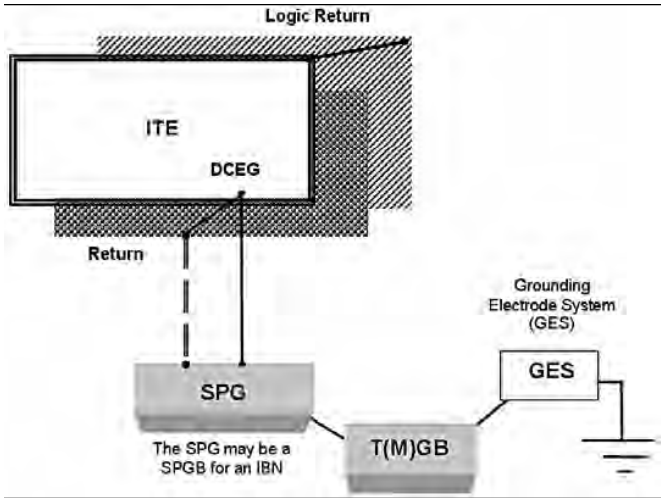

Figure 9-64— ITE with logic return and Return internally grounded to the DCEG

Page 410

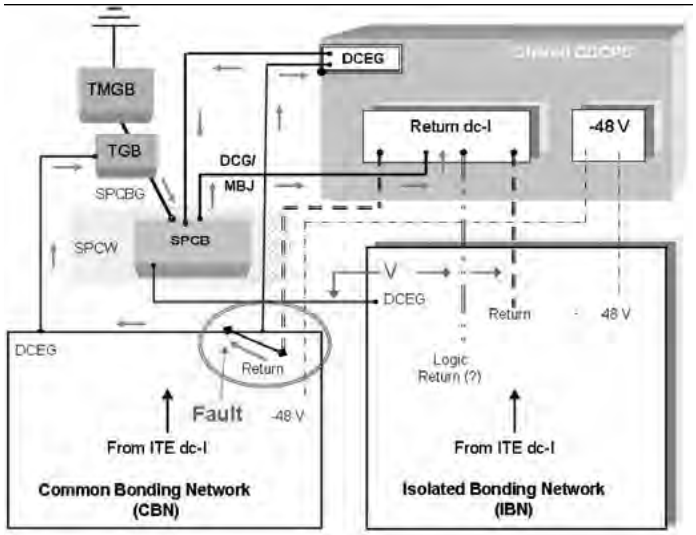

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Figure 9-70—Undesirable dc paths due to the Return of the ITE in the CBN not properly bonded to the SPCB

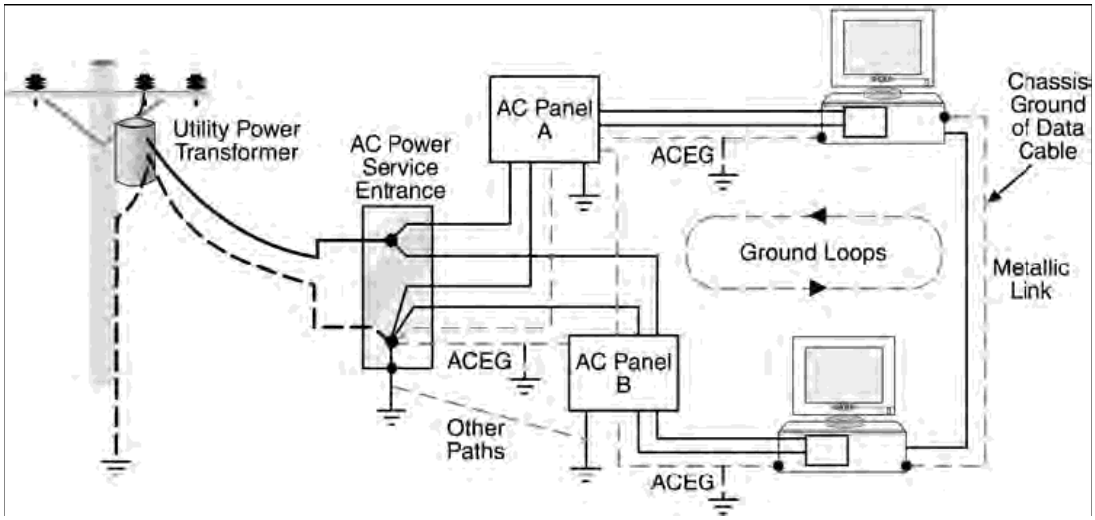

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Figure 9F-3—Example of intersystem ground noise within the same building

Page 489

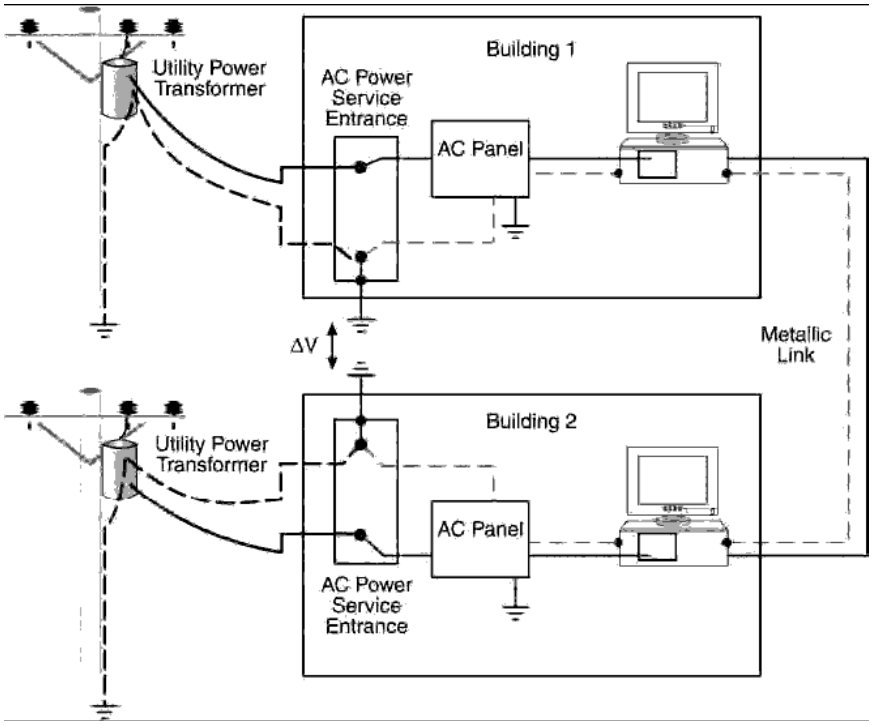

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Figure 9F-4—Example of intersystem ground noise between different buildings

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IEEE Recommended Practice for Powering and Grounding Electronic Equipment

Sponsor

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Abstract: The *IEEE Emerald Book*™ presents a collection of consensus best practices for the powering and grounding of electronic equipment used in commercial and industrial applications. The main objective is to provide consensus recommended practices in an area where conflicting information and conflicting design philosophies have dominated. The recommended practices described are intended to enhance equipment performance while maintaining a safe installation. A description of the nature and origin of power disturbances is provided, followed by theory on the various parameters that impact power quality. Information on quantifying and resolving power and grounding related concerns using measurement and diagnostic instrumentation and standardized investigative procedures are included. Recommended power protection equipment and wiring and grounding system design practices are presented. Information on telecommunications system power protection as well as grounding, industrial system grounding, and noise control is included. Finally a selection of case studies are presented to support the recommended practices presented throughout the book.
Keywords: commercial applications, electrical power, electronic equipment, grounding, industrial applications, power conditioning, power disturbance, power monitor, power quality

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D. R. MacGorman, M. W. Maier, and W. D. Rust, "Lightning Strike Density for the Contiguous United States from Thunderstorm Duration Records," for Figure 3-3.

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Introduction

(This introduction is not part of IEEE Std 1100-2005, IEEE Recommended Practice for Powering and Grounding Electronic Equipment.)

This recommended practice is a publication of the Industry Applications Society (IAS) of the IEEE and is one of the *IEEE Color Books*®, which relate to industrial and commercial power systems. The recommended practices described are intended to enhance equipment performance from an electric powering and grounding standpoint, while maintaining a safe installation as prescribed by national and local electric code requirements. The purpose of this recommended practice is to provide consensus recommended practices in an area where conflicting information and conflicting design philosophies have dominated.

As the proliferation of digital electronic equipment continues to change the way society utilizes and relies on electric power continuity, the need for standardized practices for power protection and grounding continues to grow. The requirements of the digital society have essentially outgrown the capabilities of the present day electric power supply, and the need for practices that promote system compatibility of both the electric supply and the connected equipment is important from the largest industrial facilities all the way down to home offices. The concept of system compatibility, which is covered extensively in this book, describes the mechanisms of interaction and requirements necessary to ensure that not only does the electrical power equipment connected to its power source operate properly even during moderate power fluctuations, but also that same equipment does not interfere with other equipment connected to the common power system. The responsibility for system compatibility is shared among all parties, including the electric suppliers, the equipment manufacturers, the building designers, the power conditioning equipment manufacturers, and the facility equipment specifiers, and this document supplies methods to ensure that when a system compatibility problem is present, there are adequate means of investigating and resolving the concern. It is also the intent of this document to supply power system design guidelines and recommended practices that would minimize the potential for a system compatibility concern to occur.

To address the topics detailed in the *IEEE Emerald Book*™*,* the IEEE Working Group on Powering and Grounding Electronic Equipment was originally formed in 1986 to write a recommended practice. The first *IEEE Emerald Book*™ was subsequently published in 1992, followed by a revision in 1999. The project was sponsored by the IAS Industrial and Commercial Power Systems Engineering Subcommittee. This recommended practice is intended to complement other recommended practices in the *IEEE Color Books*® and has been coordinated with other related codes and standards.

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Errata, if any, for this and all other standards can be accessed at the following URL: http://standards.ieee.org/reading/ieee/updates/errata/index.html. Users are encouraged to check this URL for errata periodically.

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