IEEE Application Guide for IEEE Std 1547™, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

IEEE Standards Coordinating Committee 21

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IEEE Application Guide for IEEE Std 1547™, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

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Abstract: Technical background and application details to support understanding of IEEE Std 1547-2003 are provided. The guide facilitates the use of IEEE Std 1547-2003 by characterizing various forms of distributed resource (DR) technologies and their associated interconnection issues. It provides background and rationale of the technical requirements of IEEE Std 1547-2003. It also provides tips, techniques, and rules of thumb, and it addresses topics related to DR project implementation to enhance the user's understanding of how IEEE Std 1547-2003 may relate to those topics. This guide is intended for use by engineers, engineering consultants, and knowledgeable individuals in the field of DR. The IEEE 1547 series of standards is cited in the Federal Energy Policy Act of 2005, and this guide is one document in the IEEE 1547 series.

Keywords: diesel generators, dispersed generation, distributed energy, distributed energy resources, distributed generation, distributed power, distributed resources, electric distribution systems, electric power systems, energy storage, Federal, fuel cells, grid, interconnection, inverter, islanding, microturbines, national, networks, paralleling, photovoltaic power systems, rulemaking, regional, state, utility, wind energy systems

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Introduction

This introduction is not part of IEEE Std 1547.2-2008, IEEE Application Guide for IEEE Std 1547™, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

IEEE Std 1547.2-2008 is one of a series of standards published by the IEEE or being developed by IEEE Standards Coordinating Committee 21 on Fuel Cells, Photovoltaics, Dispersed Generation, and Energy Storage (SCC21) concerning distributed resources (DR) interconnected with area electric power systems (EPS). IEEE Std 1547-2003[a] provides interconnection technical specifications and requirements as well as test specifications and requirements; IEEE Std 1547.1™-2005 provides the test procedures for verifying conformance to IEEE Std 1547-2003. IEEE Std 1547.3™-2007 is intended to facilitate interoperability of DR interconnected with an area EPS. The documents in the 1547 series are as follows:

— IEEE Std 1547™-2003, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

— IEEE Std 1547.1™-2005, IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems.

— IEEE Std 1547.2™-2008, IEEE Application Guide for IEEE Std 1547™, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.

— IEEE Std 1547.3™-2007, IEEE Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems.

— IEEE P1547.4™, Draft Guide for Design, Operation, and Integration of Distributed Resource Island Systems with Electric Power Systems.[b]

— IEEE P1547.5™, Draft Technical Guidelines for Interconnection of Electric Power Sources Greater Than 10 MVA to the Power Transmission Grid.

— IEEE P1547.6™, Draft Recommended Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks.

The IEEE 1547 series of standards is an outgrowth of the changes in the environment for the production and delivery of electricity and builds on prior IEEE standards, recommended practices, and guides developed by SCC21. In 2005, the Federal Energy Policy Act cited and required the 1547 series of standards for interconnection.

IEEE Std 1547.2-2008 provides application details to support the understanding of IEEE Std 1547-2003 and is intended to serve DR owners and operators as well as area EPS staff. IEEE Std 1547.2-2008 provides technical background, application details and guidance, requirements rationale, schematics, and examples to facilitate the use of IEEE Std 1547-2003.

This guide addresses some topics that are related to DR project implementation to enhance user understanding of how IEEE Std 1547-2003 may relate. This guide does not interpret IEEE Std 1547-2003 or other standards in the IEEE 1547 series and does not provide additional requirements or recommended practices related to those other IEEE 1547 standards. The interconnection examples cited in this guide are illustrative approaches, but alternative approaches could be equally applicable.

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

[b] Numbers preceded by P are IEEE authorized standards projects that were not approved by the IEEE-SA Standards Board at the time this publication went to press. For information about obtaining drafts, contact the IEEE.

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Contents

IEEE Application Guide for IEEE Std 1547™, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

1. Overview

1.1 Scope

This guide provides technical background and application details to support understanding of IEEE Std 1547-2003. [1]

1.2 Purpose

This document facilitates the use of IEEE Std 1547-2003 by characterizing the various forms of distributed resource (DR) technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the DR interconnection

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