IEEE Recommended Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks

Sponsor

IEEE Standards Coordinating Committee 21 on Fuel Cells, Photovoltaics, Dispersed Generation, and Energy Storage

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Abstract: Recommendations and guidance for distributed resources (DR) interconnected on the distribution secondary networks, including both spot networks and grid networks, are provided. This document gives an overview of distribution secondary network systems design, components, and operation; describes considerations for interconnecting DR with networks; and provides potential solutions for the interconnection of DR on network distribution systems. IEEE Std 1547.6-2011 is part of the IEEE 1547™ series of standards. IEEE Std 1547-2003 provides mandatory requirements for the interconnection of DR with EPSs and focuses primarily on radial distribution circuit interconnections. For DR interconnected on networks, all of IEEE Std 1547-2003 needs to be satisfied. IEEE Std 1547.6-2011 was specifically developed to provide additional information in regard to interconnecting DR with distribution secondary networks.
Keywords: distributed resources, distribution grid, distribution secondary networks, electric power systems, grid networks, IEEE 1547.6, interconnection, spot networks, utility grid

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

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Introduction

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The IEEE 1547 series of standards was created to develop a national consensus on using distributed resources (DR) in electric power systems (EPSs). IEEE Std 1547-2003 provides mandatory requirements for the interconnection of DR with EPSs.[a] It focuses primarily on radial feeder interconnections. For DR interconnected on networks, all of IEEE Std 1547-2003 needs to be satisfied.

IEEE Std 1547.6-2011 is part of the IEEE 1547 series of standards. IEEE Std 1547.6 provides recommendations and guidance for DR interconnected on EPS distribution secondary networks, including both spot networks and grid networks. IEEE Std 1547.6 was specifically developed to provide additional information in regard to interconnecting DR with distribution secondary networks. This document contains several clauses that address various aspects of DR interconnection with distribution secondary networks. Clause 1 provides an overview including the scope, purpose, and limitations of the document. Clause 2 provides normative references that must be understood and used with IEEE Std 1547.6, and Clause 3 lists definitions, acronyms, and abbreviations used in the document. Clause 4 identifies that IEEE Std 1547-2003 provides mandatory requirements for the interconnection of DR with EPSs. Clause 5 gives an overview of distribution secondary network systems design, components, and operation. Clause 6 describes considerations for interconnecting DR with networks. And Clause 7 provides potential solutions for the interconnection of DR on network distribution systems.

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IEEE Recommended Practice for Interconnecting Distributed Resources with Electric Power Systems Distribution Secondary Networks

1. Overview

1.1 Scope

This standard builds upon IEEE Std 1547™-2003 for the interconnection of distributed resources (DR) to distribution secondary network systems.[1] This standard establishes recommended criteria, requirements, and tests, and provides guidance for interconnection of distribution secondary network system types of area electric power systems (area EPS) with DR providing electric power generation in local electric power systems (local EPS).

1.2 Purpose

This recommended practice focuses on the technical issues associated with the interconnection of area EPS distribution secondary networks with a local EPS having DR generation. The document provides

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

recommendations relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection. In this recommended practice consideration is given to the needs of the local EPS to be able to provide enhanced service to the DR owner loads as well as to other loads served by the network. Equally, the recommended practice addresses the technical concerns and issues of the area EPS. Further, this document identifies communication and control recommendations and provides guidance on considerations that will have to be addressed for such DR interconnections.

1.3 Limitations

The recommendations in this document are not mandatory requirements. Further, the recommendations are intended to be compatible with other IEEE-related guides and recommended practices to the extent possible. These recommended practices also may not cover all locations or all operating conditions. Therefore, following the recommended practices herein does not assure that any specific DR interconnection is feasible at any specific location.

- This document applies to the interconnection of DR with an area EPS secondary network on the load side of the network protector (NP). This recommended practice presents interconnection concepts that are not binding to any area EPS operator to accept or implement.
- This recommended practice does not presume that an area EPS operator will permit DR interconnection on the local EPS side of the point of common coupling (PCC).
- This recommended practice does not presume that an area EPS operator will make any adjustments to the operation of its NPs to facilitate the operation of DR within the network.
- This recommended practice does not address protection of the customer's interconnected DR.
- A delta-wye network transformer is the basis for this document. Some of the statements may not be suitable for a wye-wye transformation.
- This recommended practice applies to distribution secondary network systems with operating voltage 1000 V and less, between any two conductors, or between a conductor and ground.
- The topics not specifically covered in this issue of the recommended practice are deferred for discussion and development in future revisions of this document.

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.

IEEE Std 1547™-2003 (Reaff 2008), IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems.[2, 3]

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.

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