A meeting of the full IEEE Standard P1547.2 Work Group was held on June 4-5, 2003 in Denver, CO. The Agenda for the meeting is included as Attachment 1 and the participant list is included as Attachment 2.

Dick Friedman presented progress to date on IEEE Standard 1547.2 development and reviewed writing assignments made and completed. The opening presentation is included as Attachment 3. Key discussion items and conclusions are summarized below.

1. The Work Group reviewed the proposed outline. The Work Group supported keeping Sections 4-6 (Interconnection System, Electric Power System, Distributed Resources) as necessary background information. Section 7, Rationale of Technical Requirements, would be kept as part of the outline pending further review. The Work Group preferred to align the discussion of technical requirements with the section numbering of IEEE 1547. The revised outline is included as Attachment 4.

2. Regarding Section 7.0, a better title than “Interconnection flow” is needed.

3. The National Electric Code (NEC) Handbook was offered as a possible model for the technical requirements section (8.0) of the Guide. This model was discussed as a possibly useful approach to be followed.

4. The Group requested that an “Index” be included in the Guide, even though IEEE Standards normally do not include an index.

5. Much discussion focused on the requirement on “Islanding” and the appropriate level of application guidance. It was decided to cover both unintentional and intentional islanding since both topics are at least introduced in IEEE Standard 1547. A caution was introduced regarding the presentation of islanding and other technical issues in the Application Guide. It was suggested that the Guide may want to differentiate between “opinion” and engineering-based results. This suggestion was tempered by ensuing discussion that focused on the need to draw upon the Work Group’s collective years of experience and engineering judgment in creating a truly useful Guide.

6. Appendices will be included in the Guide that cover networks, system impacts and intentional islanding. Bill Feero volunteered to write the first draft of the “Networks” Appendix, and to include input from the Power System Relaying Committee.

7. As a followup to discussion on guidance to section authors on what needs to be included in each section, the Work Group developed a content template (see Attachment 5). This
template will be expanded with descriptive guidance to writers.

8. It was noted that the Bibliography to the Guide will likely be extensive (e.g., three papers on Islanding were mentioned by the Work Group). The Guide will refer to these documents as appropriate.

9. There is a strong interrelationship between some of the technical requirements. As an example, grounding issues are extremely relevant to the Guide background discussion on islanding (e.g., losing the primary side ground). It was concluded that the relevant grounding issues need to be discussed in the “Islanding” section, but the reader then needs to be referred to the section on “Grounding” for more detail. This approach should serve as a model for other interrelated sections of the Guide.

10. Dick Friedman presented a listing of initial reference material, based on a similar list presented to the Work Group at a previous meeting. The references listed could be included in the Guide in either the “References” section (if they directly apply to a specific technical requirement) or the “Bibliography” section (if they provide additional background information to the reader). The Work Group suggested the following additions to the listing:

- Westinghouse “Green Book”
- Cooper Power Systems Overcurrent Protection Manual
- IEEE Standard 929
- Electrotek’s Power Quality Manual, DR Chapter
- ABB’s Applied Protective Relaying

Only documents with no proprietary use restrictions can be used in Guide development or referenced in the Guide. The “References” list as it now stands is included in Attachment 6.

11. Over the past six months or so Guide sections representing almost all of the IEEE Standard 1547 technical requirements have been written by members of the Work Group. To further set the stage for Guide section development, several of these draft sections were reviewed in detail by the full Work Group. These sections included “Islanding”, “Integration with Area EPS Grounding” and “Faults.” Group comments focused on any major omissions and/or inappropriate working. Guidance was provided to the Writing Group on outstanding issues that need to be addressed.

12. The Work Group considered the “audience” for the Guide. Based on a “homework” assignment at the end of the first day of the meeting, several alternative definitions of audience were offered. (It was suggested that the reader is presumed to be reasonably familiar with power engineering fundamentals). These definitions will be distributed to the Work Group, along with a proposed “synthesis” consensus definition.

13. Other comments made during the meeting included:

• The next Work Group meeting is tentatively set for the week of November 11, 2003. Orlando was strongly preferred by the Group as a meeting location (offering low air fares, direct access and reasonable hotel rates).

• A request was made to have John Stevens discuss active anti-islanding schemes.

14. Meeting action items are summarized below:

a. Distribute “audience” definitions.
c. Assign Guide sections to Writing Group for follow-up.
d. Writing Group to coordinate new assignments and revisions with Work Group section “coordinators.”
e. Define and distribute section writing “template” to Work Group.
f. Obtain additional reference material and upload it to 1547.2 website.
g. Prepare and distribute notes of the meeting.
h. Collect utility interconnection guidelines (e.g., Massachusetts has developed new requirements).
i. Survey Work Group members on their interconnection experience to establish database—separate fact from fiction.
j. Finalize date, venue and location of next meeting.
k. Develop DRAFT 01 of Guide by next meeting.

After thanking members of the Work Group for their participation and hard work, Richard Friedman adjourned the meeting at 5:07 p.m. on June 5, 2003

Respectfully submitted,
N. Richard Friedman, Chair
IEEE P1547.2 Work Group
Attachment 1. Agenda for the meeting
Attachment 2. Participant list
Attachment 3. Opening Presentation
Attachment 4. Revised Outline
Attachment 5. Content Template
Attachment 6. References
Attachment 1


Work Group Meeting: June 4-5, 2003 Denver, Colorado
Draft Agenda (Chair, N. R. Friedman)

Wednesday, June 4
7:30 a.m. Continental Breakfast
8:00 a.m. Welcome, Introductions and Update
  • Patent/copyright information
  • P1547 series PARs scope and purpose
  • IEEE Std. 1547 Status Update
  • IEEE P1547.2 Progress Update
  • Introduction of 1547.2 Writing Group
  • Goals for Meeting
9:00 a.m. Review 1547.2 Intended Audience and Outline
10:00 a.m. BREAK
10:30 A.M. Continue Review of 1547.2 Outline
Noon LUNCH (on your own)
1:30 p.m. Continue Review of Outline
3:15 p.m. BREAK
3:45 p.m. Continue Review of Outline
5:00 p.m. Adjourn for Day

Thursday, June 5
7:30 a.m. Continental Breakfast
8:00 a.m. Day 1 Review
  • Progress and Concerns
  • Goals for Today
8:30 a.m. Continue Review of 1547.2 Outline
10:00 a.m. BREAK
10:30 a.m. Complete Outline Review
Noon LUNCH (on your own)
1:30 p.m. Review Progress of Writing Assignments
  • Section Drafts Completed
  • References and Resource Material
  • Organization of New Writing Assignments
3:15 p.m. BREAK
3:45 p.m. Wrap-Up and Next Steps
  • Interaction with Writing Group
  • Anticipated Meeting Schedule
  • Overall 1547.2 Schedule
5:00 p.m. Adjourn
**Patent/Copyright Information Disclosure; P1547 Series PARs Scope, and Purpose**

**Patent/copyright information:** in advance of open disclosure (i.e., prior to meetings), the individual must notify the work group Chair/Officers in writing what they will be disclosing such patent/copyright information.

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**P1547 Title:** Draft Standard for Interconnecting Distributed Resources with Electric Power Systems.

**P1547 PAR Scope.** This standard establishes criteria and requirements for interconnection of distributed resources (DR) with electric power systems (EPS).

**P1547 PAR Purpose.** This document provides a uniform standard for interconnection of distributed resources with electric power systems. It provides requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection.

---

**P1547.1 Title** Draft Standard For Conformance Test Procedures for Equipment Interconnecting Distributed Resources With Electric Power Systems

**P1547.1 PAR Scope.** This standard specifies the type, production, and commissioning tests that shall be performed to demonstrate that the interconnection functions and equipment of the DR conform to IEEE Std. 1547.

**P1547.1 PAR Purpose.** Interconnection equipment that connects DR to an EPS must meet the requirements specified in IEEE 1547. Standardized test procedures are necessary to establish and verify compliance with those requirements. These test procedures must provide both repeatable results, independent of test location, and flexibility to accommodate the variety of DR technologies.

---

**P1547.2 Title** Draft Application Guide for IEEE Std. 1547 Standard for Interconnecting Distributed Resources With Electric Power Systems

**P1547.2 PAR Scope** This guide provides technical background and application details to support the understanding of IEEE Std. 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.

**P1547.2 PAR Purpose** This document facilitates the use of IEEE P1547 by characterizing the various forms of distributed resource technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the distributed resource interconnection with the electric power system. Presented in the document are technical descriptions and schematics, applications guidance and interconnection examples to enhance the use of IEEE Std. 1547.

---

**P1547.3 Title** Draft Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected With Electric Power Systems

**P1547.3 PAR Scope** This document provides guidelines for monitoring, information exchange, and control for distributed resources (DR) interconnected with electric power systems (EPS).

**P1547.3 PAR Purpose** This document facilitates the interoperability of a one or more distributed resources interconnected with electric power systems. It describes functionality, parameters and methodologies for monitoring, information exchange and control for the interconnected distributed resources with or associated with electric power systems. Distributed resources include systems in the areas of fuel cells, photovoltaics, wind turbines, microturbines, other distributed generators, and, distributed energy storage systems.
<table>
<thead>
<tr>
<th>NAME</th>
<th>COMPANY</th>
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<tbody>
<tr>
<td>Baker, Philip</td>
<td>Duke Energy</td>
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<td>Bassett, David</td>
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<td>Brodie, M.N.</td>
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<td>W.E. Feero, P.E.</td>
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<td>Zaffina, Michael</td>
<td>United Illuminating Co.</td>
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IEEE P1547.2 Work Group Meeting

Draft Application Guide for IEEE Std. 1547, Standard for Interconnecting Distributed Resources with Electric Power System

N. Richard Friedman, June 4-5, 2003

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IEEE 1547.2 Meeting Agenda

- Background and Introductions
- Review Guide Outline and Audience
- Review Progress of Writing Assignments
- Wrap-Up and Next Steps
  - Interaction with Writing Group
  - Overall Schedule
Introductory Information

- Patent/copyright information
- P1547 Series of PARS
- 1547 Status Update
- Introduction of 1547.2 Writing Group
- Goals for Meeting

P1547 Series of Standards for Interconnection

P1547 Draft Standard for Interconnecting Distributed Resources with Electric Power Systems

Guide for Networks

Guide for Interconnection System Certification

Guide for Impacts

Guide for Islanding & Anti-Islanding

P1547.2 Draft Application Guide for IEEE P1547 Draft Standard for Interconnecting Distributed Resources with Electric Power Systems

P1547.3 Draft Guide for Monitoring, Information Exchange and Control of DR Interconnected with EPS

P1547.1 Draft Standard for Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

The above schematic identifies existing standards development projects and activities under discussion by P1547 Work Group members.
P1547.2 DRAFT APPLICATION GUIDE FOR IEEE Std. 1547, STANDARD FOR INTERCONNECTING DISTRIBUTED RESOURCES WITH ELECTRIC POWER SYSTEMS

IEEE P1547.2 Title

IEEE P1547.2 Scope

This guide provides technical background and application details to support the understanding of IEEE 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems.
IEEE P1547.2 Purpose

This document facilitates the use of IEEE Std. 1547 by characterizing the various forms of distributed resource technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the distributed resource interconnection with the electric power system. Presented in the document are technical descriptions and schematics, applications guidance and interconnection examples to enhance the use of IEEE 1547.

IEEE P1547.2 Purpose - Key Words

This document facilitates the use of IEEE Std. 1547 by characterizing the various forms of distributed resource technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the distributed resource interconnection with the electric power system. Presented in the document are technical descriptions and schematics, applications guidance and interconnection examples to enhance the use of IEEE 1547.
What 1547.2 is Intended to Do

Support understanding and facilitate the use of IEEE 1547 by

- Providing technical background
- Providing application details
- Characterizing the various forms of distributed resource technologies
- Characterizing the associated interconnection issues
- Discussing the background and rationale of the technical requirements in terms of the operation of the interconnection.
- Presenting good practice approaches.

What 1547.2 Will Not Do

- Interpret IEEE 1547
- Introduce new requirements to IEEE 1547
- Address issues not covered in IEEE 1547, other than as needed to help enhance the user's understanding of IEEE 1547
- Provide a "guarantee" that IEEE 1547 requirements will be met

Interpretations - “documents issued to explain and clarify the intent of passages within a standard.”
IEEE Standards Classification

- Standards: documents with mandatory requirements (shall).
- Recommended Practices: documents in which procedures and positions preferred by the IEEE are presented (should).
- Guides: documents in which alternative approaches to good practice are suggested but no clear-cut recommendations are made (may).

IEEE P1547.2 Writing Group

- Dave Bassett
- Tom Basso
- Mac Brodie
- Per Drewes
- Dick Friedman
- Tom Gordon
- EJ Honton
- Gerald Johnson
- Charles Rogers
- Bob Saint
- Bill Steeley
Jan 2003 Breakout Sessions

- Breakout 1 (facilitator: E.J. Honton of the Resource Dynamics Corporation -- RDC). Introductory Sections – Sections 1-3 of the outline;
- Breakout 2 (facilitator: N. Richard (Dick) Friedman of RDC, Elizabeth Kime of RDC. Technical Requirements with Application Guidance – Sections 4-7 of the outline;
- Breakout 3 (facilitator: Elizabeth Kime, RDC). Reference, Process and Supporting Material – Sections 8-10 of the outline.
- Breakout 4 (co-facilitators: Dan Sammon of Con Edison (NYC), and Lynnda Ell of Entergy Services) Technical Rationale/Background.

Breakout Group 1 - Jan 2003 Introductory Sections

E.J. Honton (facilitator)
## Breakout Group 2 - Jan 2003
### Technical Requirements/App Guidance

Dick Friedman, Facilitator

Largest Group - Participants on Following List

<table>
<thead>
<tr>
<th>Section</th>
<th>Coordinator</th>
<th>Contributors</th>
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<tr>
<td>4.1 Voltage Regulation</td>
<td>Steve Early</td>
<td>Kevin Loving, Steve Early, Jason Lin, Jim Watts, Ross Guttromson, Tim Wall, Reigh Walling, Travis Johnson</td>
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<td>4.2 Integration with area EPS grounding</td>
<td>Jim Lemke</td>
<td>Charles Rogers, Jim Lemke, Jason Lin, Tim Wall, Travis Johnson, Tom Duffy</td>
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<td>4.3 Synchronization (Common with Loss of Sync, Flicker)</td>
<td>Jeff Pope</td>
<td>Gerald Johnson, Jason Lin, Jeff Pope, Micky Pitt, Jim Daley, Travis Johnson, Charles Rogers</td>
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<tr>
<td>4.4 Distributed Resources on Distribution Secondary Grid and Spot Networks</td>
<td>Joe Debs</td>
<td>Joe Debs, Reigh Walling (liaison to PES), Tony Mazy, Dave Costyk, Kevin Donahoe, Paul Williams, Dan Sammons, Martin Baier</td>
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<tr>
<td>4.5 Inadvertent Energization</td>
<td>Jason Lin</td>
<td>Gerald Johnson, Jason Lin, Yuri Khersonsky, Tom Duffy</td>
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<td>4.6 Monitoring</td>
<td>Charles Rogers</td>
<td>Charles Rogers, Tony Mazy</td>
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<td>4.7 Isolation Device</td>
<td>Jason Lin</td>
<td>Jason Lin, Jim Watts, Yuri Khersonsky, Rob Wills, Travis Johnson, Tom Duffy</td>
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<tr>
<td>4.8 Interconnect Integrity</td>
<td>Mike Behnke</td>
<td>Charles Rogers, Mike Behnke, Yuri Khersonsky, Kevin Loving</td>
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<td>5.1 Faults</td>
<td>Charles Rogers</td>
<td>Charles Rogers, Tim Wall, Simon Wall, Tom Duffy</td>
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<td>5.2 Reclosing Coordination</td>
<td>Reigh Walling</td>
<td>Reigh Walling, Ross Guttromson, Tom Gordon, Gerald Johnson, Tim Wall, Charles Rogers, Tom Duffy</td>
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<td>5.3 Voltage</td>
<td>Jim Watts</td>
<td>Charles Rogers, Mike Behnke, Jim Watts, Paul Williams, Tom Duffy</td>
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<td>5.4 Frequency</td>
<td>Jim Watts</td>
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<tr>
<td>5.5 Loss of Synchronism</td>
<td>Jeff Pope</td>
<td>Same group as 4.3, Synchronization</td>
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<td>5.6 Reconnection</td>
<td>Gerald Johnson</td>
<td>Gerald Johnson, Tom Gordon</td>
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<td>6.1 DC Injection</td>
<td>Steve Chalmers</td>
<td>Steve Chalmers, Reigh Walling, Rob Wills</td>
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<td>6.2 Flicker</td>
<td>Jeff Pope</td>
<td>Same group as 4.3, Synchronization, and 5.5, Loss of Synchronism</td>
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<td>6.3 Harmonics</td>
<td>Bob Saint</td>
<td>Tony Mazy, Steve Chalmers, Joe Debs, Jason Lin, Dave Costyk, Travis Johnson, Chuck Whitaker, Paul Williams, Gerald Johnson, Sam Ye, Jeff Pope, Per Drewes, Rob Wills</td>
</tr>
<tr>
<td>7 Islanding</td>
<td>Chuck Whitaker and Rob Wills</td>
<td>Tonic Mazy, Steve Chalmers, Joe Debs, Jason Lin, Dave Costyk, Travis Johnson, Chuck Whitaker, Paul Williams, Gerald Johnson, Sam Ye, Jeff Pope, Per Drewes, Rob Wills</td>
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Breakout Group 3 - Jan 2003
References, Process and Supporting Matl

Elizabeth Kime (facilitator),
David Van Holde, Steve Rosenstock,
Matt Romanow and Holly Thomas
Breakout Group 4 - Jan 2003 P1547 Rationale/Background

Dan Sammon and Lynnda Ell (co-facilitators), Carl Williams, Roger Dugan, John Stevens, Timothy Zgonena and Joe Koepfinger.

Review Audience and Guide Outline

- Intended Audience
- Line by line review of detailed outline
Logical Flow of DR Project

- Building the Interconnection System
- Operating the Interconnection System
- Ensuring Good Power Quality Performance
- Response of the Interconnection System
- Surge Withstand (4.1.8.2)
- EMI (4.1.8.1)
- Paralleling Device (4.1.8.3)
- Provision for Monitoring (4.1.6)
- Isolation Device (4.1.7)

Additional Considerations for Networks
- Additional Considerations for Islanding

Writing Assignments
Introductory Sections
- Overhead distribution systems
- Underground distribution systems
- Transformer connections
Writing Assignments - Technical Requirements & Application Guidance

- Voltage Regulation (4.1.1)
- Synchronization (4.1.3)
- Inadvertent Energization of the Area EPS (4.1.5)
- Isolation Device (4.1.7)
- Loss of Synchronism (4.2.5)
- Reconnection to Area EPS (4.2.6)
- Limitation of DC Injection (4.3.1)
- Limitation of Flicker Induced by the DR (4.3.2)
- Harmonics (4.3.3)

Additional Assignments Completed

- Integration with Area EPS Grounding (4.1.2)
- Monitoring Provisions (4.1.6)
- Surge Withstand Performance (4.1.8.2)
- Paralleling Device (4.1.8.3)
- Area EPS Faults (4.2.1)
- Voltage (4.2.3)
- Frequency (4.2.4)
- Islanding (4.4)
- Special Assignment - Area EPS System Impacts
Wrap Up & Next Steps

- Interaction with Writing Group
- Schedule Update
  - Original Schedule - voting draft by 2004
  - New Schedule - voting draft by 2005
Attachment 4


Revised Outline (June 4-5, 2003, Chair, N. R. Friedman)

Preface
- How to use this guide

Introduction
- Series of Standards
- History of IEEE 1547 Development
- Process of Adoption

1.0 Overview
1.1 Scope of 1547.2 (How to use this Guide)
1.2 Purpose of 1547.2
  1.2.1 Intended Audience
  1.2.2 Limitations of 1547.2 (Impact Studies and Business/Tariff Issues Outside Scope)
1.3 Guiding Principles of IEEE 1547
  1.3.1 Uniform Criteria and Requirements
  1.3.2 Universality of Adopting IEEE Std. 1547
  1.3.3 Minimum Functional Technical Requirements
  1.3.4 Interconnection as Focus of IEEE Std. 1547
  1.3.5 Technology Neutral
  1.3.6 Technical Attributes of DR and the Types of EPSs Have Bearing on Interconnection
  1.3.7 Additional Requirements

2.0 References
2.1.1 IEEE Std. 1547
2.1.2 IEEE Std. 1547.1

3.0 Definitions

4.0 The Interconnection System (For Section 4 of 1547, see Section 8 of this guide)

5.0 The Electric Power System (Area and Local EPS)
5.1 Discussion of Area EPS Distribution Circuits
  5.1.1 Design, Construction and Configuration
  5.1.2 Operation During Normal Conditions
  5.1.3 Operation During Abnormal Configurations
  5.1.4 Operation During Abnormal Conditions (e.g., faults)
5.2 Area EPS Concerns
5.3 Understanding the Local EPS

6.0 The Distributed Resource
6.1 DR Power Conversion Technologies
  6.1.1 Synchronous Generator
  6.1.2 Induction Generator
  6.1.3 Inverters and Static Power Converters
6.2 Options for DR Intended Operation

7.0 Rationale for Technical Requirements (see Figure 1)
7.1 Discussion of IEEE Std. 1547
  7.1.1 Scope and Purpose
  7.1.2 Limitations
7.2 Intertie Projects and IEEE 1547 Requirements
  7.2.1 Building the Interconnection System
  7.2.2 Power Quality Performance of the Interconnection System
  7.2.3 Operation of the Interconnection System
  7.2.4 Response of the Interconnection System to Abnormal Conditions
  7.2.5 Additional Considerations for Networks
  7.2.6 Additional Considerations for Islanding

8.0 Application Guidance for IEEE Std. 1547 Technical Specifications & Requirements (“NEC Handbook formatting” approach, exact text of IEEE 1547 requirement)
8.1 General Requirements (4.1)
  8.1.1 Voltage Regulation (4.1.1)
  8.1.2 Integration with AEPS Grounding (4.1.2)
  8.1.3 Synchronization (4.1.3)
  8.1.4 Distributed Resources on Secondary Grid and Spot Networks (4.1.4)
    8.1.4.1 Distribution Secondary Grid Networks (4.1.4.1)
    8.1.4.2 Secondary Spot Networks (4.1.4.2)
  8.1.5 Inadvertent Energization of the Area EPS (4.1.5)
  8.1.6 Monitoring Provisions (4.1.6)
  8.1.7 Isolation Device (4.1.7)
  8.1.8 Interconnect Integrity (4.1.8)
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    8.1.8.2 Surge Withstand Performance (4.1.8.2)
    8.1.8.3 Paralleling Device (4.1.8.3)

8.2 Response of the Interconnection System to Area EPS Abnormal Conditions (4.2)
  8.2.1 Area EPS Faults (4.2.1)
  8.2.2 Area EPS Reclosing Coordination (4.2.2)
  8.2.3 Voltage (4.2.3)
  8.2.4 Frequency (4.2.4)
  8.2.5 Loss of Synchronization (4.2.5)
  8.2.6 Reconnection to Area EPS (4.2.6)

8.3 Power Quality Performance of the Interconnection System (4.3)
  8.3.1 Limitation of DC Injection (4.3.1)
  8.3.2 Limitation of Flicker Induced by the DR (4.3.2)
  8.3.3 Harmonics (4.3.3)

8.4 Additional Considerations for Islanding (4.4)
  8.4.1 Unintentional Islanding (4.4.1)
  8.4.2 Intentional Islanding (4.4.2)

9.0 Application Guidance for IEEE Std. 1547 Interconnection Test Specifications and Requirements
  9.1 Design Test (5.1)
  9.2 Production Tests (5.2)
  9.3 Interconnection Installation Evaluation (5.3)
  9.4 Commissioning Tests (5.4)
  9.5 Periodic Interconnection Tests (5.5)

10.0 Interconnection Information
  10.1 Information about the DR
  10.2 Information about the Area EPS
  10.3 Information about the Local EPS
  10.4 Information about the Interconnection System

Appendices
A. Bibliography
B. Glossary
C. Examples
D. System Impacts
E. Networks
F. Add an Index

Other Appendices as Needed: System Impacts, Networks, etc. ????
Figure 1. Flowchart Explaining Section 7.0, Rationale for Technical Requirements

Building the Interconnection System → Ensuring Good Power Quality Performance

Operating the Interconnection System → Response of the Interconnection System

Surge Withstand (4.1.8.2)  
EMI (4.1.8.1)  
Paralleling Device (4.1.8.3)  
Provision for Monitoring (4.1.6)  
Isolation Device (4.1.7)

Additional Considerations for Networks

Additional Considerations for Islanding

1.0 Overview

(IEEE Clause 1 description: The overview shall be a succinct description of the scope of the standard and may include, if necessary, the purpose, applications, and other areas that the working group considers relevant. These optional topics may be presented as separate subclauses of the overview. If these separate subclauses are presented, a minimum of two subclauses are required. Detailed discussions of the general technical content should not be part of the overview. If the standard contains annexes, these should be described in the overview.)

This standard provides…. Additionally, there are annexes in this document. Annex A is a bibliography that lists citations referred to in this standard for informative purposes but those are not required to be used in conjunction with this standard. The Annexes B through ZZ …

1.1 Scope

(IEEE Scope description: The scope of the standard shall explain what is covered in the standard and, if necessary, what is not covered in the standard. In other words, the technical boundaries of the document shall be discussed. The scope shall be the same in context as the scope set forth in the current PAR for the standards project. Please note the distinction from the purpose of the standard discussed in above.)

(P1547.2 PAR Scope -- verbatim.) This guide provides technical background and application details to support the understanding of IEEE Std. 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems.

(Could have more explanatory text under scope)

1.2 Purpose

(IEEE Purpose Description: A paragraph describing the purpose is not mandatory. However, if included, the purpose of the standard and its intended application shall be included in a separate subclause. The purpose shall explain why the standards project is needed. The purpose shall be the same in context as the purpose set forth in the current PAR for the standards project. Please note the distinction from the scope of the standard discussed in above.)

(P1547.2 PAR Purpose -- verbatim.) This document facilitates the use of IEEE P1547 by characterizing the various forms of distributed resource technologies and the associated interconnection issues. Additionally, the background and rationale of the technical requirements are discussed in terms of the operation of the distributed resource interconnection with the electric power system. Presented in the document are technical descriptions and schematics, applications guidance and interconnection examples to enhance the use of IEEE Std. 1547.

(Could have more explanatory text under purpose… )
1.3 Limitations

(This 1.3 heading is not “mandatory”, but some developers still like that subheading; IEEE has dropped this as a required pro-forma sub-clause heading).

(Other subheadings could be under 1.0 with those headings providing more overview information….)

2.0 References

The following standards shall be used in conjunction with this standard. When the stated version of the following standards is superseded by an approved revision, then that revision shall apply.

3.0 Definitions and Acronyms

For purposes of this standard, the following terms and definitions apply. (“fix this reference: IEEE Std 100) should be referenced for terms not defined in this clause.

3.1 Definitions

3.1.1 (alphabetical – don’t worry about numbering now)

3.2 Acronyms

3.2.1 (alphabetical – don’t worry about numbering now)

4.0 (P1547.2-specific numbering starts herein with 4.0)

… 10.0 (etc.)

Annex A. (Informative) Bibliography

Annex B. (Informative) etc.

(End style guide information).
Attachment 5

Draft IEEE Std. P1547.2 Content Template: Format of Application Guidance

Title

IEEE Std. 1547 Requirement

What (is intent of Requirement)?

When (does requirement apply to interconnected DR)?

- Feeder type, loading, relation to feeder protection and coordination scheme, other connected DR, etc.
- DR type of power conversion (e.g., static or rotating), size, where connected in relation to substation

How (is requirement to be met)? - examples
- NRECA Application Guide to 1547
- P1547 WGRD
- IEEE 1001
- P1547 presentations
- Drafts of P1547
- Westinghouse T&D Manual
- IEEE Color Book series
- NEC Handbook
- EPRI PTI report
- EPRI Kinectrics report
- EEI “29 Issues” report
- IEC DG Standards
- Utility interconnection guidelines
- State interconnection guidelines/rules
- Manufacturer engineering guides
- Electrical engineering handbooks
- Electrician’s handbooks
- E-Source report
- Westinghouse “Green Book”
- Cooper Power Systems Overcurrent Protection Manual
- IEEE Standard 929
- Electrotex’s Power Quality Manual, DR Chapter
- ABB’s Applied Protective Relaying